The complexity of Treatment Failure – Prevalence and Predictors of Dropout and Non-Response in psychological treatment for traumatized populations

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General Abstract

The efficacy of psychological interventions in the treatment of traumatized patients has been widely demonstrated (Martin et al., 2021) and the current evidence shows promising results for specific populations, such as refugees and asylum seekers (e.g., Thompson et al., 2018). However, there is strong evidence that a substantial proportion of patients does not benefit sufficiently from treatment or discontinues treatment prematurely (Schottenbauer et al., 2008; Varker et al., 2021). Treatment failure is a complex construct that can be viewed as an umbrella term encompassing several aspects, such as dropout and non-response (Oasi & Werbart, 2020). The consequences of treatment failure are far-reaching and include negative effects on the patient, the therapist, society, and the healthcare system in general (e.g., Ogrodniczuk et al., 2005; Smith-Apeldoorn et al., 2019; Swift et al., 2012). However, to date there is a significant lack of research on dropout and non-response in the treatment of traumatized patients. In order to gain an in-depth understanding of both aspects, which can later form the basis for deriving preventive measures, it is important to examine the prevalence and identify baseline predictors. Therefore, the overarching aim of this thesis was to fill this gap by providing new evidence on the prevalence and predictors of dropout and non-response in the treatment of traumatized populations. In particular, this thesis covers three publications designed to investigate the prevalence and predictors of dropout in understudied areas, namely the treatment of refugees and treatment of PTSD patients in naturalistic settings. The fourth publication focused on non-response, aiming to investigate its prevalence and predictors in PTSD treatment.

Publication I and *Publication II* were the first to provide comprehensive evidence on the prevalence and predictors of dropout in the treatment of refugees and asylum seekers. In the absence of previous knowledge, *Publication I* was designed as a review, synthesizing refugee-specific findings and additionally reviewing existing evidence on treatment dropout in general

and applying the findings to the refugee population. Further, we reviewed the current evidence on measures to prevent dropout. The review revealed a significant range of reported dropout rates, varying from 0% to 64.7%. Additionally, the review emphasized the importance of predictors specific to refugees, such as high initial impairment, differing perceptions of mental health, deviating expectations of psychological treatment, and external treatment barriers. To prevent dropout, it is crucial to prioritize the promotion of cultural competencies, cultural adaptation of treatment, and preparation for treatment.

Based on the findings of the review, *Publication II* aimed to provide the first comprehensive evidence on the prevalence and predictors of dropout in psychological or psychosocial interventions for refugees and asylum seekers. The meta-analytic results of 28 eligible randomized controlled trials (RCTs), with 39 active treatment conditions, and 2,691 participants, revealed a weighted average dropout rate of 19.14%. Dropout was less frequent in the treatment condition compared to the control condition ($OR = 0.52$). The results revealed no significant predictor of dropout, except the country in which the study was conducted, but showed a potential influence of refugee-specific variables on dropout. Overall, the findings suggest that the dropout rate is comparable to those reported in non-refugee populations. Future research should focus on refugee-specific variables, such as duration of stay in the country of resettlement and asylum status, rather than applying predictors of dropout from Western samples directly to the refugee population.

Publication III examined the dropout rates and predictors of dropout in PTSD treatment in a naturalistic setting. Of the 195 adults diagnosed with PTSD included in the study, 15.38% discontinued trauma-focused cognitive behavioral therapy prematurely, which was provided in three specialized outpatient centers. Dropout rates were higher in younger patients, and lower in patients who lived with their parents compared to living alone. Results showed that the dropout rate found in naturalistic settings was comparable to dropout rates found in RCT studies. Although routinely assessed baseline patient variables were associated with dropout,

the results on prediction performance indicate that the overall model, comprising different pretreatment variables, could not predict dropout to a practically useful level.

Publication IV was the first study to provide comprehensive evidence on the prevalence and predictors of non-response to first-line guideline-recommended psychological treatments for PTSD. The meta-analysis employed a methodology similar to Publication II, and meta-analyzed 86 studies, with 117 active treatment conditions, and 7,894 patients. The weighted average non-response rate was 39.23%, and non-response was less frequent in the treatment condition compared to the control condition (*OR* = 0.22). Higher non-response rates were found to be associated with male gender, older age, and with being a refugee or veteran. Further, higher PTSD symptom severity and the presence of comorbid depressive disorder or higher depressive symptoms was associated with non-response. Treatment type and treatment format were identified as significant treatment-related predictors, with lowest non-response rates in treatments combining prolonged exposure (PE) and cognitive therapy (CT), and in a combination of individual and group therapy. Finally, non-response was significantly higher in studies reporting intention-to-treat (ITT) analysis compared to per-protocol (PP). The findings indicate that treatment modifications should be considered for specific subgroups of PTSD patients characterized by one or more of the identified baseline predictors.

In conclusion, this thesis addresses the lack of research on treatment failure in traumatized populations. The integrated findings of the four publications provide comprehensive knowledge on the prevalence and predictors of dropout and non-response in the treatment of PTSD in general, in specific subpopulations of traumatized patients, and in specific treatment settings. Future research should focus on a wider range of specific predictors and examine underlying mechanisms and process variables beyond pretreatment predictors. In clinical practice, the findings have implications for the derivation of measures to prevent and reduce dropout and non-response in the treatment of traumatized populations.

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Abbreviations

AIC	Akaike Information Criterion
AUC	Area under the ROC curve
BEP	Brief eclectic therapy
BIC	Bayesian Information Criterion
BPD	Borderline personality disorder
CAPS	Clinician-Administered PTSD Scale
CBT	Cognitive-behavioral therapy
CPT	Cognitive processing therapy
cPTSD	Complex Posttraumatic Stress Disorder
CSC	Clinically significant change
CT	Cognitive therapy
CTQ	Childhood Trauma Questionnaire
DBT	Dialectical-behavior therapy
DERS	Difficulties in Emotion Regulation Scale
DES	Dissociative Experience Scale
DSM	Diagnostic and Statistical Manual of Mental Disorders
EMDR	Eye movement desensitization and reprocessing
GAD	Generalized anxiety disorder
GRADE	Grading of Recommendations, Assessment, Development and Evaluation
ICD	International Classification of Diseases
IIP	Inventory of Interpersonal Problems
IPD-MA	Individual participant data meta-analysis
IPSI	Interpretation of Symptoms Inventory
ITT	Intention-to-Treat

MAR	Missing at random
MD	Major Depression
NET	Narrative Exposure Therapy
PAI	Personalized Advantage Index
PE	Prolonged exposure therapy
PCL-5	PTSD Checklist for DSM-5
PD	Personality Disorder
PP	Per Protocol
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analysis
PROSPERO	International Prospective Register of Systematic Reviews
PSS-I	PTSD Symptom Scale - Interview
PTCI	Posttraumatic Cognitions Inventory
PTSD	Posttraumatic stress disorder
RC	Reliable change
RCT	Randomized controlled trial
REML	Restricted maximum likelihood
RoB	Risk of bias
ROC	Receiver Operating Characteristic
SCID	Structured Clinical Interview for DSM
SUD	Substance use disorder
TF-CBT	Trauma-focused cognitive behavioral therapy
UNHCR	United Nation High Commissioner for Refugees
UNRWA	United Nations Relief and Works Agency

1 General Introduction

"There is no achievement without failure."

— John C. Maxwell, 2020 —

M. is a 22-year-old business student who lives in a shared apartment. Her parents live far away and their contact is sparse. Six months before M. sought treatment, she was involved in a car accident in which her partner was seriously injured (inspired by a case report by Wild & Ehlers, 2010). M. reported on intrusive memories of the accident, regular flashbacks, and severe nightmares. Since the accident, M. has been unable to drive. Even as a passenger, she feels extremely uncomfortable and reported frequent flashbacks. In the pre-treatment assessment, M. showed negative interpretations of the intrusive memories she was experiencing; she felt like she was going mad. After the accident, M. continued to develop depressive symptoms. She reported that she could barely get out of bed in the morning. She no longer exercised or went out with friends, even though she used to love to. M. was diagnosed with posttraumatic stress disorder (PTSD) and comorbid depression according to the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2022). M. started trauma-focused cognitive-behavioral therapy (CBT) with weekly sessions. After three preparatory sessions, M. and her therapist initiated the trauma-focused treatment, targeting the trauma memory with imaginal exposure to the traumatic event, dysfunctional assumptions towards traumatic symptoms, and a trigger analysis with discrimination training. In session 10, M. began to work on the traumatic event through imaginal exposure. After an intensive session in which she re-experienced the traumatic situation in detail, M. did not show up for the next scheduled treatment session from one day to the next. All attempts to continue the treatment ran into the void. M. had decided to terminate her treatment prematurely. This treatment dropout caused a symptom aggravation for M. and a feeling of failure and rejection for the therapist. But what predicted M.'s dropout? How frequent is treatment failure? And could there have been measures to prevent this treatment failure?

As John C. Maxwell (2000) aptly summarized in his quote, failures, whether in life in general or in the course of therapeutic treatment, are important reference points for learning and improvement. In our society, as well as in psychological research and practice, there is widespread consensus on this assumption (Cuijpers, 2019; Eskreis-Winkler & Fishbach, 2019; Oasi & Werbart, 2020). Despite the importance of understanding the phenomenon of treatment failure, of systematically defining and operationalizing it, of quantifying its prevalence, and of identifying factors that predict its occurrence - psychological treatment failure does not receive the attention it deserves (Lambert, 2011; Lampropoulos, 2010).

For traumatized populations in general and PTSD in particular, the efficacy of psychological treatments has been widely demonstrated, with trauma-focused interventions serving as first-line guideline-recommended treatments (American Psychological Association, 2017; Martin et al., 2021). Further, the current evidence shows promising results for the effectiveness of these interventions also for specific populations, such as refugees or asylum seekers (e.g., Kip et al., 2020; Nose et al., 2017; Thompson et al., 2018). However, there is a strong evidence that not all patients improve adequately after receiving effective treatment (e.g., Bradley et al., 2005; Schottenbauer et al., 2008; Straud et al., 2019). Improving clinical practice requires the development of new innovative interventions as well as the improvement of existing evidence-based treatments. To address these challenges, Ehring et al. (2022) proposed a new conceptual model, the translational framework, which involves sequential, interrelated steps. The importance of a consideration of treatment failure is described as a sequential step in the model. Analyzing treatment failure, such as dropout and non-response, aims to improve the acceptability, efficacy, and effectiveness of treatments for a wide range of patients, including specific subgroups such as refugees and asylum seekers. According to the model, research on treatment failure is embedded in the framework and informs all previous and subsequent steps in the translational chain. As this translational approach seems very promising for psychological treatment research, investigating treatment failure and considering different subgroups of

patients is essential. Comprehensive research in this area helps to identify treatment failure early and to provide measures and recommendations for early treatment adjustments and novel approaches for patients that do not benefit sufficiently from existing treatments (Sippel et al., 2018).

1.1 Treatment Failure – a complex construct

1.1.1 Dimensions of Treatment Failure

Treatment failure is a complex construct with no clear conceptual framework and various challenges in defining and operationalizing the different aspects embedded in the term (Lampropoulos, 2010). However, treatment failure can be seen as an umbrella term for different aspects of failure and undesirable effects in the course of therapeutic treatment (Oasi & Werbart, 2020). One main reason for the lack of a common conceptual framework and a uniform definition of the related aspects may be the different angles from which the phenomenon can be viewed. First, a distinction is made between the perspective being used: patient, therapist, or researcher (Oasi & Werbart, 2020). Second, different types of outcomes (e.g., symptom change, quality of life, functioning) can be considered (Cuijpers, 2019), that are being measured at different time points. Third, it is important to distinguish between definitions that focus on change, endpoints, or a combination of the two. Definitions that focus on change need to be further divided into absolute (fixed magnitude) and relative (patient-dependent) measures (Larsen et al., 2020). Finally, definitions may also vary depending on the context (e.g., research, clinical context) in which they are used (Smith-Apeldoorn et al., 2019). It is important to note that the definitions, but above all the specific operationalization methods, differ between disorders.

The central aspects of this work, dropout and non-response, are embedded in the umbrella term treatment failure. The *Treatment Outcome Framework*[1] presented in Figure 1 is intended to bring some light into the darkness by graphically placing the various aspects of treatment failure into context. Note that the definitions are provided in a simplified form. The model serves to provide a clear understanding of dropout and non-response within the

[1] The *Treatment Outcome Framework* was developed for this thesis based on Varker et al. (2020), Smith-Apeldoorn et al. (2019), Brooks & Greenberg (2024), and Swift & Greenberg (2012).

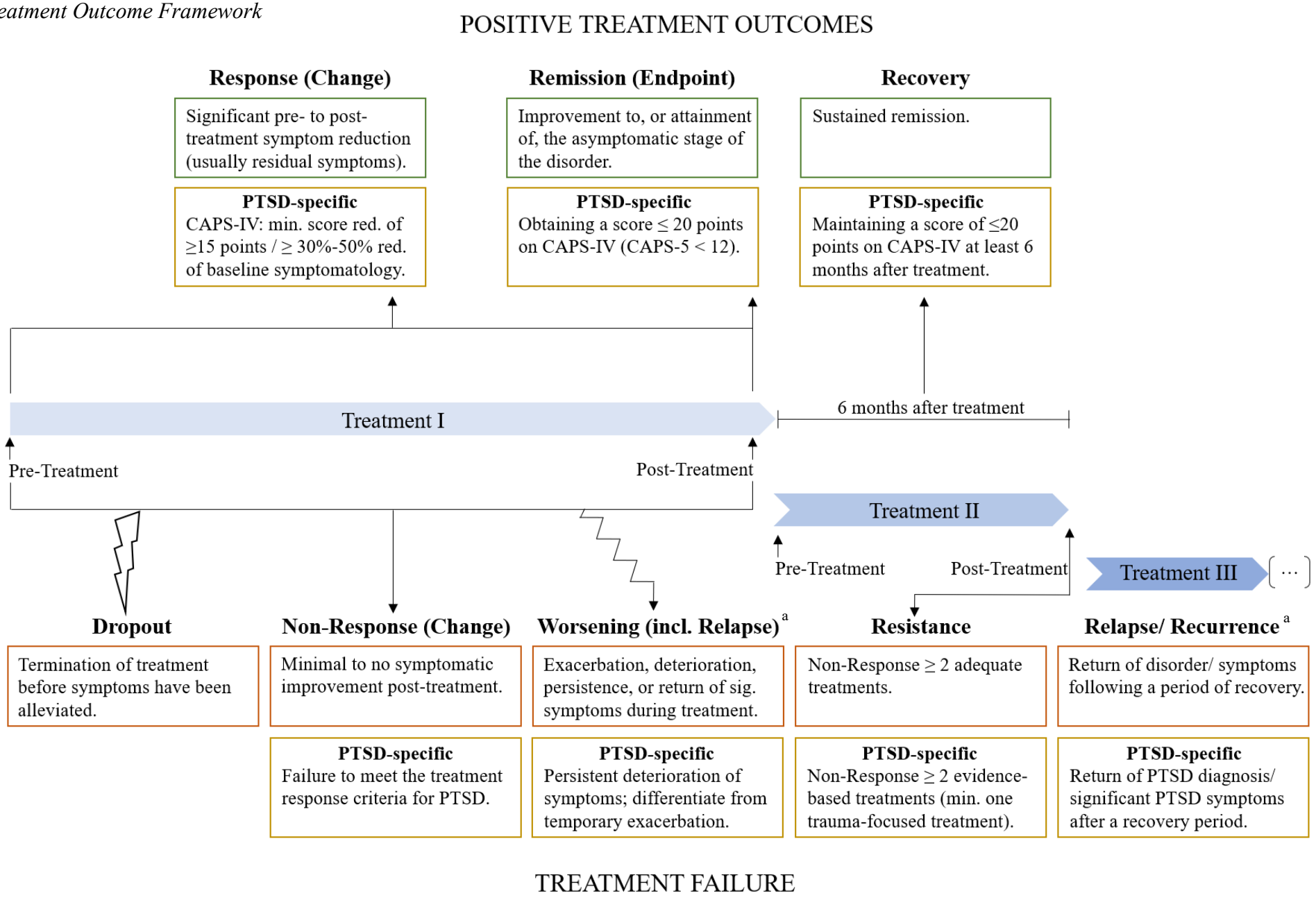
framework of the big picture, and to distinguish the relevant terms from related aspects. Positive treatment outcomes are also presented to complete the picture. Operational definitions specific to PTSD are highlighted. These refer to measures from the Clinician-Administered PTSD Scale (CAPS).

The graphical presentation of the *Treatment Outcome Framework* required a dichotomous classification of the individual aspects as positive treatment outcomes on the one hand and treatment failure on the other. It is important to note that this dichotomous classification is a simplified approach that may not be universally applicable in all cases. For instance, dropout can also occur after sufficient symptom improvement (see the concept of positive dropout in chapter 3). Similarly, non-response may occur with respect to a specific outcome measure but not with respect to others.

While the *Treatment Outcome Framework* in Figure 1 provides an abbreviated operational definition of each aspect of treatment outcome, the current state of the definition and operationalization of dropout and non-response is examined in more detail below. This is due to the fact that the present dissertation focuses on dropout and non-response, as two central aspects of treatment failure.

Figure 1

Treatment Outcome Framework



Note. Definitions and operationalization methods are based on Varker et al. (2020), Smith-Apeldoorn et al. (2019), Brooks & Greenberg (2024), and Swift & Greenberg (2012). The operational definitions only represent one definitional suggestion and need to be seen as simplified presentation of the complex constructs.

CAPS = Clinician-Administered PTSD Scale; *PTSD* = Posttraumatic Stress Disorder; *red.* = reduction; *min.* = minimum

[a] The term relapse can be used to refer to the return of clinically significant symptoms during treatment (Smith-Apeldoorn et al., 2019; Varker et al., 2020) or after treatment (Brooks & Greenberg, 2024). According to Brooks & Greenberg (2024), relapse can be defined as meeting diagnostic criteria for PTSD after an initial recovery period of at least several (i.e., three) months without significant (i.e., meeting diagnostic criteria) PTSD symptoms. Recurrence therefore represents the beginning of a new and separate PTSD episode.

1.1.2 Understanding Dropout: definitional challenges and proposed solutions

Although there is currently no consensus in the literature on the definition of dropout, most researchers agree that dropout can be defined as the discontinuation of an initiated treatment before the symptoms, including impairment of functional level, distress, etc., that had led the patient to seek treatment have been alleviated (e.g., Hatchett & Park, 2003; Swift & Greenberg, 2012). In addition, there is a consensus that dropout is a unilateral decision by the patient (Swift & Greenberg, 2012) and that dropout needs to be distinguished from non-starting or refusing a treatment (Garfield, 1994). Upon closer examination, it is important to consider several challenges related to defining and operationalizing dropout. The broad definition encompasses various specific aspects, such as a discontinuation of treatment without reaching the therapeutic goal, without completing the full scope of treatment, and without achieving the full therapeutic benefit (Swift & Greenberg, 2012). Further, the different definitional

approaches utilize different operationalization methods, which are not always clearly distinguished in the literature. Instead, operational definitions of dropout are often used.

There are five operational definitions commonly used to describe dropout. First a duration-based definition, which implies the definition of a certain number of sessions that is considered the minimum dose for symptom improvement. Any patient who attends fewer sessions is considered a dropout. Considering the dose-effect model, which describes a negatively accelerating (log-linear) relationship between treatment dose and response (Falkenström et al., 2016; Howard et al., 1986), this method appears useful. In addition, this method is characterized by a high degree of comparability and applicability, which is particularly important, for example, in clinical research (Semmlinger & Ehring, 2021; Swift et al., 2009). However, this method has several disadvantages. Determining a fixed dose or duration does not take into account the uniqueness of the therapeutic process or the individual time required for improvement, which can lead to misclassifications (Swift et al., 2009). Additionally, it is uncertain whether this method can be effectively applied in clinical practice as it only considers a binary measure of treatment duration and does not take into account other factors such as improvement (Hatchett & Park, 2003). This is particularly relevant for treatments that do not have a predetermined number of sessions (O'Keeffe et al., 2019).

Second, failure to complete the full course of treatment can be used to define and operationalize dropout. In this case, dropout is operationalized by not completing the full treatment protocol. The strength of this method is its high degree of reliability and comparability. However, there is subjectivity regarding the choice of the treatment protocol (Swift & Greenberg, 2012). Another disadvantage is the misclassification of patients who recover early and therefore terminate treatment prematurely.

Third, a decision based on therapist judgment is often used. After a patient discontinues treatment, the therapist determines whether the termination is considered a dropout case. This method has been the preferred method for a long time (Wierzbicki & Pekarik, 1993) and is still

the preferred method, especially in clinical practice (Zimmermann et al., 2017). The advantage of an individual assessment by a therapist who is deeply involved in the treatment process and can evaluate it is significant. However, there is a risk of low reliability and comparability, a mismatch between therapist and patient rating, or the difficulty of evaluating one's own treatment process negatively (e.g., Hatchett & Park, 2003; Swift et al., 2009).

Fourth, a patient who misses a scheduled session without rescheduling or attending another session is classified as a dropout according to the operational definition of missed appointments. This measure is known to be highly reliable and comparable across studies (Wierzbicki & Pekarik, 1993). In addition, Hatchett and Park (2003) found a high degree of agreement with the therapist judgment classification, indicating that the two methods measure the same construct. Thus, this method may compensate for the limitations of therapist judgment without targeting a different construct. In contrast, Swift et al. (2009) found a risk of misclassification with this method, particularly for patients who have recovered and therefore no longer attend for treatment.

Finally, a highly objective approach employs the constructs of clinically significant change (CSC) or reliable change (RC) to define and operationalize dropout. Based on standardized outcome measures administered before and during treatment, any discontinuation before achieving a score within the nonclinical range or before achieving a change in outcome scores that reflects reliable improvement is considered a dropout (Jacobson & Truax, 1991). Swift et al. (2009) supported this method because it is valid, reliable, and unaffected by bias. However, the authors further discussed its disadvantages, particularly its exclusive focus on symptom improvement. This approach fails to consider that other aspects, such as level of functioning, may be important treatment goals. Additionally, treatment may be sought for reasons other than symptom reduction, such as guidance on life issues.

Considering that all operational definitions have their advantages and disadvantages, it seems advisable to use a multi-method operationalization (Swift et al., 2009). It seems

important to agree on a common definition of dropout as a first step and adapt the operationalization to the feasibility and context. To ensure comparability and facilitate meta-research, it is imperative to accurately report the operationalization method used. In clinical practice, it is recommended to combine therapist judgment with an objective measure of symptom change, such as CSC or RC. This requires regular outcome monitoring. In clinical research, it is important to provide realistic and feasible recommendations that have a high degree of reliability and comparability. Therefore, it seems advisable to use a dose-based approach. This requires that the determination of a minimum dose for symptom improvement is not solely based on a dichotomous categorization of discontinuation by duration, but also on previous knowledge of the typical dose for symptom improvement. To prevent misclassification of patients with early recovery, an additional assessment based on significant change in symptoms may be considered, if feasible in the given setting.

1.1.3 Understanding Non-Response: definition, operationalization, challenges

Treatment non-response can be defined as little or no symptom reduction after completion of an evidence-based, guideline-recommended treatment (Smith-Apeldoorn et al., 2019). It is important to note that response and non-response always refer to the use of an adequate treatment approach. As with dropout, there is currently no agreed-upon definition or operationalization method of non-response in general, and for PTSD treatment in particular (Varker et al., 2020). Before defining and operationalizing non-response, it is important to note that a distinction must be made between change, that is pre- and post-treatment difference, and endpoint, that is post-treatment, focused operationalization methods (Larsen et al., 2020). The operational definition of non-response refers to a definition of change. Definitions of change can be categorized as either absolute or relative measures. Absolute measures refer to a fixed value, such as a 10-point change on the CAPS scale. In contract, relative measures define

change in reference to the individual patient, such as a 50% change from baseline, or to a specific scale. However, it is important to note that the commonly used non-response operationalization method, loss of diagnosis (absence of PTSD diagnosis at post-treatment), combines both change and endpoint definition (Larsen et al., 2020).

When operationalizing treatment non-response, it is important to focus on disorder-specific methods. Therefore, I will concentrate on non-response in PTSD treatment (Varker et al., 2020). This contrasts an operationalization of dropout that can be generalized in its basic ideas to the treatment of various disorders (Swift & Greenberg, 2014). Non-Response is commonly operationalized as a failure to meet the treatment response criteria (Varker et al., 2020). However, in PTSD treatment trials, there are several operational definitions of response that are analyzed in the comprehensive review by Varker et al. (2020). Note that although the authors refer to these criteria as response criteria, they are directly applied to the operationalization of non-response in the following.

The most commonly used operationalization method is based on the loss of diagnosis definition of response, mostly based on CAPS diagnostic criteria (Varker et al., 2020). Conversely, non-response is the retention of a PTSD diagnosis after treatment. Larsen et al. (2020) defined loss of diagnosis as no longer meeting PTSD symptom diagnostic criteria at post-treatment, with a symptom reduction of ≥10 points on the CAPS-IV, and a CAPS-IV score of <45 at post-treatment.

In addition to diagnosis-focused operationalizations, non-response is further commonly operationalized based on PTSD symptom reduction. There are four different implementations of reduction-focused methods. These refer to either a determination of symptom reduction based on clinician-rated PTSD measures, most commonly the CAPS, or self-reported PTSD measures, such as the PTSD Checklist (PCL). However, the latter is less commonly used. First**,** non-response can be operationalized as failure to achieve a minimum score reduction on a clinician-rated or self-reported PTSD measure. Based on Varker et al. (2020) a minimum score

reduction of <15 points from baseline on the CAPS-IV should be classified as non-response. Second, the operationalization can be based on a failure to achieve a minimum percentage of symptom reduction on a clinician-rated or self-reported PTSD measure. Varker et al. (2020) proposed a symptom reduction of less than 30% - 50% from baseline as decisive for non-response, while Larsen et al. (2020) are inclined to support the 50% threshold. Third, a cutoff score can be used to determine whether an individual's symptom change from baseline is clinically significant. A common method to derive this cutoff score is the Reliable Change Index, as described by Jacobson and Truax (Jacobson & Truax, 1991). Any failure to reach this cutoff score is classified as a non-response. Fourth, non-response can be operationalized as failure to meet a predefined cut-off score on a clinician-rated or self-reported PTSD measure. Note that this is an endpoint-focused operational definition. In the literature, a cut-off score of ≤20 on the CAPS-IV (Varker et al., 2020) or <20 on the CAPS-IV (Larsen et al., 2020) is sometimes used to classify response. However, it is suggested that this cut-off score is primarily used to define remission, as it can be indicative of an asymptomatic state (≤ 19 asymptomatic in Weathers et al., 2001). It is important to note that the operational definitions of response and remission are often used interchangeably in the literature. Thus, I have discussed the cut-off score in this section.

In addition to operationalization methods that focus solely on symptom reduction, there are less commonly used methods that incorporate changes in functional outcomes to assess non-response. Some methods use a combination of symptom reduction and functional outcomes, while others consider only changes in functional outcome measures for decision making (Varker et al., 2020). Possible functional outcome measures may include occupational, social, family-related, physical, or mental functioning, as well as quality of life measures (Bonfils et al., 2022). According to Larsen et al. (2020), an operational definition of response without additional measures is not considered critical because the primary outcome is prioritized.

However, reporting additional measures of comorbid symptoms and functional measures could be beneficial.

A number of concerns with current operationalization methods need to be considered. Firstly, the empirical validity of categorizing non-response based on a specific percentage, fixed score, or cut-off indicating insufficient symptom reduction is questionable (Varker et al., 2020). In the majority of cases, the decision criteria are arbitrary and lack empirical evidence. An empirical definition and validation are urgently needed. Additionally, it is necessary to validate these measures for different versions of one instrument, such as CAPS-IV versus CAPS-5, and for different assessments, such as CAPS versus PTSD Symptom Scale - Interview (PSS-I) (Larsen et al., 2020; Varker et al., 2020). Further, it is important to develop a measure that enables comparability between instruments. As a solution, non-response could be defined as a failure to achieve a reduction of a given percentage on a scale's range, whereby the percentage has been validated across scales (Larsen et al., 2020). There is no consensus in the literature regarding the consideration of baseline severity. Varker et al. (2020) suggested taking baseline severity into account to prevent misclassification of patients with significant change but severe symptoms post-treatment. In contrast, Larsen et al. (2020) argued that any improvement should be considered a response, even if patients are still symptomatic after treatment.

While commonly agreed definitions already exist for other disorders such as depression (Frank et al., 1991) and obsessive-compulsive disorder (Pallanti et al., 1991), the outlined challenges show that there is still no consensus in PTSD research regarding the conceptualization of response and non-response. Therefore, a closer examination of non-response in the treatment of traumatized populations, particularly PTSD, is urgently needed.

1.2 Adverse consequences of Treatment Failure

Examining the existing evidence on treatment failure, including dropout and non-response, reveals the complexity of the construct, particularly when treating traumatized populations. But why is it so important to take a close look at treatment failure? Treatment failure is common and can have various negative effects on patients, therapists, and the healthcare system. Therefore, when evaluating the evidence for specific treatments, it is important to consider not only the efficacy but also the potential treatment failure.

At the patient level, treatment failure can have far-reaching negative consequences. Failure to achieve symptomatic improvement (non-response) or the reduced likelihood of symptomatic improvement (dropout) may lead to an aggravation or chronification of symptoms (Swift et al., 2012). Treatment failure can further result in a significant and long-lasting decrease in quality of life and social functioning (e.g., Mauskopf et al., 2009). It may also increase the risk of somatic morbidity (e.g., Greden, 2001), drug and alcohol abuse (Berk et al., 2012), and suicidal ideation (Mrazek et al., 2014). Patients further repot a feeling of dissatisfaction (Bjork et al., 2009). In addition, treatment failure is a severe stressor for therapists that can cause lasting impact (Farber, 1983; Piselli et al., 2011) and especially in the case of non-response a uncertainty on how to proceed with treatment (Fonzo et al., 2020). A sense of rejection and failure, resulting in frustration and a decrease in self-esteem are possible reactions (Ogrodniczuk et al., 2005). Last, treatment failure places a continuing burden on family members (Barrett et al., 2008), as well as employers, and the healthcare system (Smith-Apeldoorn et al., 2019). The combination of high healthcare expenses and a simultaneous loss of productivity causes a significant financial burden.

1.2.1 Importance of considering Dropout and Non-Response in traumatized populations

Traumatic experiences are common in the course of people's lives (Benjet et al., 2016). However, not all individuals who experience trauma develop symptoms (Bonanno et al., 2015). Nevertheless, a significant minority may develop mental disorders, with PTSD being the most widely recognized trauma-related mental disorder (Morina et al., 2014). PTSD occurs after exposure to traumatic events and is characterized by specific symptoms. These symptoms include intrusive re-experiencing of the traumatic event, avoidance of trauma-related stimuli, negative changes in mood or cognitions, and increased arousal and reactivity (American Psychiatric Association, 2022). Although significant progress has been made in research and evidence-based treatments are available, PTSD remains a disorder that is associated with complex patterns and treatment difficulties (Burback et al., 2023). Additionally, spontaneous remission is rare (Morina et al., 2014). The treatment of traumatized populations presents unique challenges that are inherent in the associated disorders, particularly PTSD. These challenges can lead to suboptimal treatment outcomes, such as dropout or non-response.

Therapeutic challenges may arise from characteristics inherent in the post-traumatic symptomatology itself, or from comorbid, social, or systemic factors associated with the disorder. First, emotional dysregulation in patients with PTSD may reduce tolerability for trauma-focused treatments. Second, suicidal ideation can affect the initiation, completion, and success of treatment (Burback et al., 2023; Holliday et al., 2018). Suicidal ideation may occur before or during treatment, such as during a temporary aggravation of symptoms at the start of trauma-focused treatment. Third, dissociations, conceptualized as complex form of the disorder, can also affect the treatment process and response (Atchley & Bedford, 2021). Emotional processing theory suggests that dissociation may interfere with the trauma-focused memory work. Fourth, trauma-related guilt and shame, referred to as moral injury, contribute to patient complexity and can impede treatment success if not addressed in treatment (Burback

et al., 2023; Jinkerson, 2016). Moreover, comorbidities often complicate PTSD treatment. The presence of comorbid depression can lead to a more severe symptomatology, including lower functioning, social withdrawal, and avoidance (Kline et al., 2021). Besides depression, comorbid substance use disorder may result in greater impairment, complex needs, and poorer functioning, which can negatively impact both treatment adherence and treatment outcome (Roberts et al., 2022). Further, PTSD frequently occurs in military populations, which have specific characteristics such as internal or moral conflicts and ongoing exposure to distress that complicate the treatment course (Burback et al., 2023).

Research has shown that the treatment of PTSD faces several challenges that can result in treatment failure, such as dropout and non-response. That means a considerable number of patients who started PTSD treatment discontinue prematurely (e.g., Lewis et al., 2020; Varker et al., 2021), and a significant proportion of those who complete treatment do not improve sufficiently (e.g., Larsen et al., 2019; Varker et al., 2020). Given the fact that PTSD causes significant mental and physical stress for patients (Burback et al., 2023; Pacella et al., 2013) and a high economic burden (Davis et al., 2022), it becomes evident that undesirable treatment outcomes have far-reaching consequences, especially in traumatized populations. Premature termination of treatment or inadequate response may result in prolonged treatment and a persistent severe disorder. This can lead to severe impairment in several areas, including symptom aggravation and chronification, an increased suicidal risk (Panagioti et al., 2012), higher rates of comorbid disorders such as depression (Breslau et al., 2000) and substance use disorder (Mills et al., 2006), a reduction in quality of life (Koenen et al., 2008), and a deterioration in social and interpersonal functioning (Norman et al., 2007). Further, marital problems (Cohen et al., 2009) and reduced occupational performance (Erbes et al., 2011) may occur or persist. In addition, persistent PTSD can impose a significant burden on family members, the healthcare system, and society due to its direct and indirect costs (e.g., Davis et

al., 2022). Therefore, a detailed consideration of dropout and non-response is particularly important for this complex group of traumatized patients.

1.2.2 Refugees and asylum seekers: a specific subgroup of traumatized patients

Refugees and asylum seekers are a subgroup within traumatized populations that require special consideration due to their unique characteristics. With 108.4 million forcibly displaced people worldwide and Germany being one of the most important host countries, refugees and asylum seekers play an important role in the treatment of traumatized populations (United Nation High Commissioner for Refugees, 2023). Refugees and asylum seekers are exposed to a number of traumatic experiences in their home countries, during displacement, and during the resettlement process (e.g., Böttche et al., 2016; Hargreaves, 2002; Priebe et al., 2016). As a result of the exposure to these multiple pre- , peri-, and post-migration stressors, refugees are at a significantly higher risk of experiencing psychological distress and multiple trauma (Kalt et al., 2013). Therefore, higher rates of mental disorders, especially PTSD, depression, and anxiety disorders have been found in refugee populations (Fazel et al., 2005; Handiso et al., 2023; Nickerson et al., 2011; Steel et al., 2009). In recent years, significant effort has been devoted to developing effective interventions for refugees. The current evidence shows promising results for the effectiveness of psychological interventions, however, findings are not consistent (Kip et al., 2020; Nose et al., 2017; Thompson et al., 2018; Turrini et al., 2019).

Despite the high demand for psychological treatment, refugees and asylum seekers face specific challenges that can promote dropout or non-response to treatment. First, post-migration stressors, such as language-related difficulties, insecure residence status, challenging accommodation situations, socio-economic difficulties, homesickness, and isolation, can pose challenges to the treatment process (e.g., Böttche et al., 2016; Liedl et al., 2016). These stressors can interfere with the actual therapeutic plan and promote treatment failure. Second, challenges

that are directly related to the disorder can have impact on the success of treatment. Cultural differences in the perception of mental illness and different expectations of psychological treatments and therapists are common (e.g., Barrett et al., 2008; Liedl et al., 2016; Slobodin & de Jong, 2015). Further, refugees may suffer from complex symptom patterns due to multiple, specific traumatic experiences. Successful treatment requires an adaption to these unique circumstances (Nickerson et al., 2011). To conclude, investigating treatment failure in traumatized populations requires particular attention to refugees and asylum seekers.

1.3 Prevalence and Predictors of Dropout and Non-Response

1.3.1 Dropout in the treatment of traumatized populations

1.3.1.1 Prevalence

With the increasing awareness of the severe consequences of premature termination of psychological treatment, there is has been a growing body of research assessing the prevalence of dropout, both in general and in the treatment of traumatized populations specifically. The most recent large-scale meta-analysis of dropout across disorders found a weighted average dropout rate of 19.7%, CI [18.7, 20.7], and a high degree of heterogeneity (range 0%–74.2%) (Swift & Greenberg, 2012). Comparable dropout rates have been found in the treatment of traumatized populations, in specific treatments with a primary focus on PTSD. Lewis et al. (2020) estimated an average dropout rate of 16%, 95% CI [14, 18] for psychological treatments of PTSD. This is consistent with Imel et al.'s (2013) previous findings, which estimated a dropout rate of 18.3%, 95% CI [14.8, 21.8]. Focusing on guideline-recommended PTSD treatments, a pooled average dropout rate of 20.9%, 95% CI [17.2, 24.9] was reported by Varker et al (2021).

Although evidence on dropout rates from treatment for traumatized patients is growing, less is known about specific populations or treatment settings. In terms of specific populations, there is a growing interest in combat-related PTSD among military personnel. Edwards-Stewart et al. (2021) found a pooled average dropout rate of 24.2% across treatments, while Goetter et al. (2015) reported a dropout rate of 36% for outpatient treatment of combat-related PTSD. In contrast, there is a lack of research on dropout in refugee populations. Estimates on dropout rates from psychological treatment for refugees can only be derived from single treatment efficacy trials that show high variability in reported dropout rates, ranging from 0% (D.E. Hinton et al., 2009) to 64.7% (Renner et al., 2011). In addition to differentiating between specific populations, it is also important to consider differences in treatment settings. The vast

majority of research on PTSD treatment dropout focuses on randomized controlled trials (RCTs), while there is a lack of research on dropout rates in naturalistic settings, such as routine clinical care. The only available meta-analytic estimate is provided by Goetter et al. (2015), however they focus on the military population. Mitchell et al. (2022) conducted a new meta-analysis that includes both RCTs and non-RCTs. They reported a pooled dropout rate of 41.5%. However, separate estimates by study design are not available. It is important to note that generalizing the results from RCT settings to naturalistic settings may be problematic (Leichsenring, 2004), indicating a significant research gap.

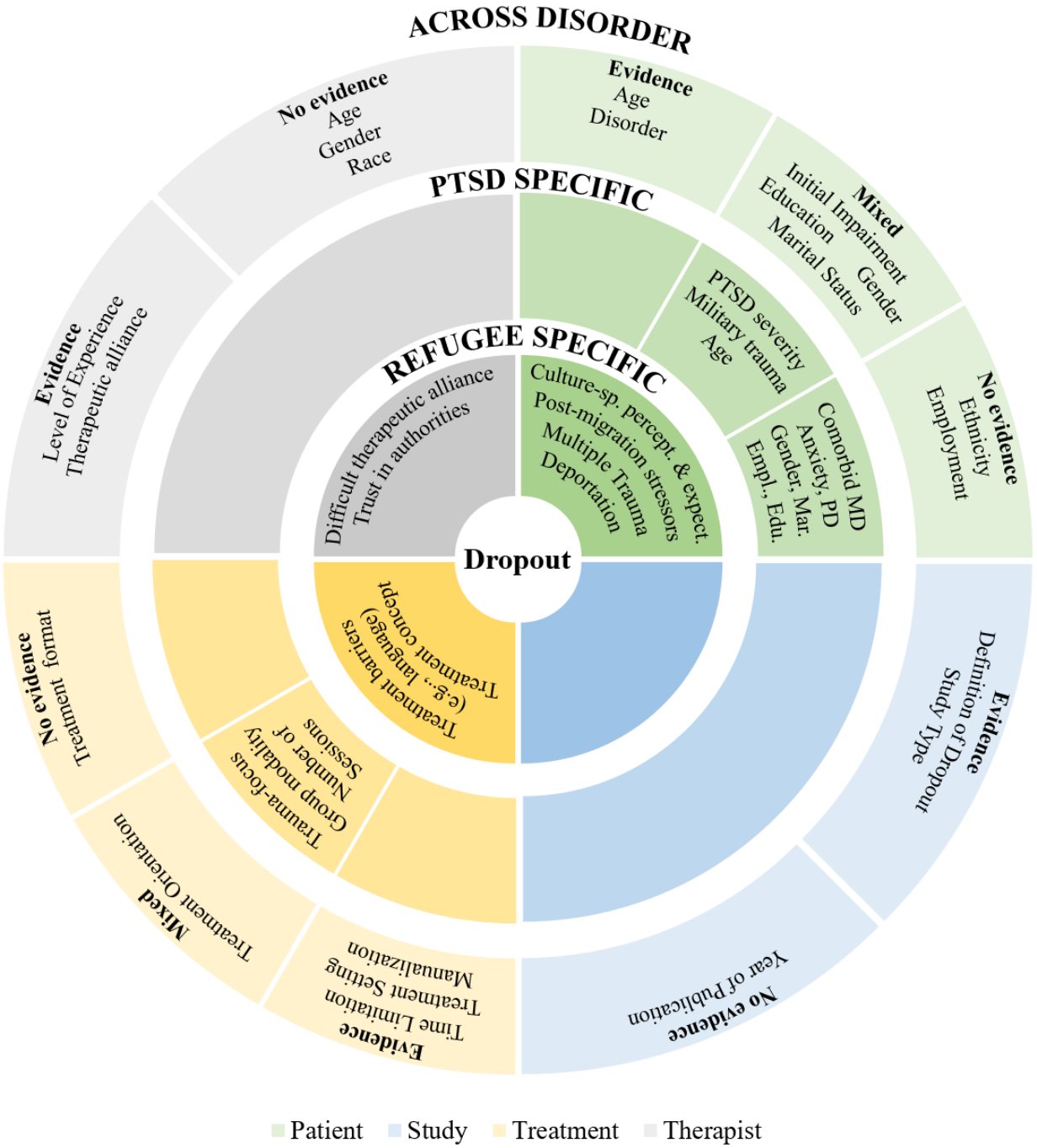
1.3.1.2 Prediction model

Several variables can influence the occurrence of treatment dropout, which can be divided into four categories: patient, treatment, therapist, and study characteristics. To understand dropout in traumatized populations, it is important to consider possible predictors in all four domains. A cross-diagnostic consideration needs to be complemented by PTSD-specific research findings, as well as considerations of significant subpopulations, such as refugees. Note that, as with prevalence, evidence on predictors in naturalistic settings is largely lacking. The *Dropout Prediction Model*[2] in Figure 2 provides a structural model of frequently studied dropout predictors in meta-analytic research. Both the division into the four domains and the specific perspectives are highlighted. It is important to note that there is no empirical evidence for refugees, therefore only theoretical considerations are presented.

[2] The *Dropout Prediction Model* was developed for this thesis based on a synthesis of previous meta-analytical research.

Figure 2

Dropout Prediction Model



Note. Predictors refer to variables frequently studied in meta-analytic research. For refugee specific predictors results only refer to theoretical considerations. Therefore, predictor blocks are not subdivided. *PTSD* = Posttraumatic Stress Disorder; *MD* = Major Depression; *PD* = Personality Disorder; *Mart*. = Marital Status; *Empl*. = Employment; *Edu*. = Education; *Culture-spe. percept. & expect*. = Culture-specific perceptions & expectations

Patient variables

Across disorders, age has been proven a relatively robust predictor, with younger age predicting higher dropout rates (Swift & Greenberg, 2012). Higher dropout rates have also been found for patients with personality disorders and eating disorders. There is conflicting evidence regarding the influence of education, gender, and marital status (Swift & Greenberg, 2012; Zimmermann et al., 2017). In addition, the influence of high initial impairment has been widely discussed (Barrett et al., 2008; Zimmermann et al., 2017). No evidence was found for patient ethnicity and employment (Swift & Greenberg, 2012).

When focusing on the PTSD sample, it is important to consider predictors that are specific to this patient group. However, in current research no predictor has been shown to be significant across studies. Among patient variables, PTSD symptom severity and the influence of military trauma are widely studied predictors. Mitchell et al. (2022) and some individual studies (Garcia et al., 2011; Zandberg et al., 2016) found an influence of PTSD symptom severity on the dropout rate, which contrasts with previous findings (Varker et al., 2021). However, Varker et al. (2021) demonstrated an effect for military trauma, which was not confirmed by Lewis et al. (2020). In addition, mixed findings have been reported regarding young age as a predictor of dropout (effect: e.g., Goetter et al., 2015; no effect: e.g., Varker et al., 2021). Although inconsistent in identifying significant predictors, no effects were consistently found for comorbid disorders (depression, anxiety, personality disorders), gender, education, employment status, and marital status (Lewis et al., 2020; Mitchell et al., 2022; Varker et al., 2021). To date, only a few studies have examined other PTSD-specific factors that may have theoretical underpinnings. These factors include emotion regulation (Belleau et al., 2017; Gilmore et al., 2020; Shnaider et al., 2022), anger (Hinton et al., 2022; Rizvi et al., 2009; van Minnen et al., 2002), impaired social functioning (Zayfert et al., 2005), dissociative symptoms (Hagenaars et al., 2010), childhood trauma (Miles & Thompson, 2016; van Minnen

et al., 2002), catastrophic cognitions and avoidance (Bryant et al., 2007). However, the results of studies examining the influence of these factors on the dropout rate are consistently mixed.

Currently, there are only theoretical considerations on the influence of certain variables on premature termination of treatment for the refugee population. A strong influence has been attributed to the multiple exposure to pre-, peri-, and post-migration stressors. The ongoing burden and the multiple traumatization may lead to a high initial impairment, which could be associated with a higher probability of dropout (e.g., Liedl et al., 2016; Nickerson et al., 2011). It is further conceivable, that culture-specific perceptions and assumptions about mental health, psychological treatment, and therapists (Barrett et al., 2008; Liedl et al., 2016), as well as certain socialization-related gender roles (Boyd-Franklin, 2013) affect dropout.

Treatment variables

Regarding the impact of treatment-related factors across disorders, higher dropout rates were found in treatments with no time limit, when treatment was provided in university-based settings, and in treatments categorized as non-manualized (Swift & Greenberg, 2012). Treatment orientation had an effect on the dropout rate only in the treatment of PTSD, depression, and anxiety (Swift & Greenberg, 2014). However, whether treatment was provided in individual or group format did not influence the dropout rate across disorders (Swift & Greenberg, 2012).

In the treatment of PTSD, there is a specific concern regarding the tolerability of trauma-focused interventions (Foa et al., 2002; Hembree et al., 2003) and the potential impact of treatment modality (i.e., trauma-focused vs. non-trauma-focused) on the dropout rate. However, the evidence is mixed. Recent meta-analyses have suggested higher dropout rates in trauma-focused treatments for PTSD patients in general (Hoppen, Jehn, et al., 2023; Lewis et al., 2020) and in military populations (Edwards-Stewart et al., 2021; Varker et al., 2021). However, earlier meta-analyses initially found no evidence of an effect of trauma focus on dropout (Bisson et

al., 2007; Hembree et al., 2003; Imel et al., 2013). In addition, mixed evidence was found for the influence treatment format. Imel et al. (2013) and Goetter et al. (2015) reported higher dropout rates in treatments delivered in group format, while Lewis et al. (2020) could not support these findings. Imel et al. (2013) further found that dropout rates increased with higher numbers of treatment session provided.

Refugees face several treatment barriers that influence the initiation and retention of treatment, with language barriers and communication difficulties being the most significant. These challenges may impact the treatment process and increase the likelihood of dropout (Slobodin & de Jong, 2015). It is also conceivable that premature termination of treatment is influenced by the concept of treatment, which primarily focuses on a linguistic exchange, and the limited consideration of daily living conditions (Liedl et al., 2016). Note that these assumptions are based solely on theoretical considerations.

Therapist variables

There is evidence that dropout is influenced by the therapist's level of experience, with higher dropout rates when treatment was provided by less experienced therapists (Roos & Werbart, 2013; Swift & Greenberg, 2012). In addition, a weaker therapeutic alliance was associated with higher dropout rates (Cinkaya, 2016; Roos & Werbart, 2013; Sharf et al., 2010). No evidence was found for the effect of therapist age, gender, or race on dropout (Swift & Greenberg, 2012).

While therapist variables in the treatment of PTSD have not been explicitly studied, some specific considerations can be made for the treatment of refugees. This population may have difficulties in establishing a strong therapeutic alliance due to negative experiences with authorities that could influence their perception of the therapist. In general, trust seems to be an important factor, especially in the treatment of refugees. It is therefore conceivable that these variables influence the occurrence of dropout, however evidence is still missing.

Study variables

Study characteristics, such as methodological factors and study design, can also influence the dropout rate. Currently, there is no uniform definition and operationalization of dropout. The evidence indicates that the dropout rates vary depending on the definition used. The highest dropout rates have been found when dropout was classified according to therapist judgment (Hatchett & Park, 2003; Swift & Greenberg, 2012). Furthermore, study type predicted dropout rates, with higher rates observed in studies evaluating treatment effectiveness (Swift & Greenberg, 2012).

1.3.2 Non-Response from psychological interventions for PTSD

Considering non-response from psychological treatment there are significant differences between disorders. A cross-disorder consideration would go beyond the scope of this work. Therefore, we will exclusively focus on non-response in treatment of PTSD. Despite the far-reaching consequences of non-response and the enormous added value of an early detection and subsequent adjustment of a negative course of treatment, to my knowledge no meta-analysis has focused on the prevalence and predictors of non-response in PTSD treatment. Most outcome studies focus on effect sizes, and when a dichotomous outcome measure is reported, it usually refers to response rather than non-response. Furthermore, since there are no meta-analyses available and the evidence only refers to reviews, there are no definitive findings on predictors. This must be considered when examining the current evidence on the prevalence and predictors of non-response.

1.3.2.1 Prevalence

Non-response is a common phenomenon in the treatment of PTSD. According to a large-scale review of 55 studies by Schottenbauer et al. (2008), non-response rates can reach up to 50% in PTSD treatment. This is in line with Bradley et al.'s (2005) meta-analysis, which

showed that 44% of patients still met the criteria for PTSD after receiving cognitive behavioral therapy (CBT) or eye movement desensitization and reprocessing (EMDR). More recent meta-analyses, although focused on treatment response, suggested a non-response rate in the same range. Specifically, 41% of patients still met criteria for PTSD after receiving manualized first-line psychological treatment for PTSD (Straud et al., 2019). In the military population, even higher non-response rates ranging from 50-72% were found (Steenkamp et al., 2015).

The non-response rates observed in the treatment of PTSD are comparable to those found in other disorders, such as anxiety disorders or depression. A non-response rate of 30% to 40% from psychological treatments appears to be consistently reported in the literature (Gloster et al., 2020; Taylor et al., 2012).

1.3.2.2 Predictors of Non-Response to PTSD Treatment

Patient variables

Various demographic variables have been examined as predictors of non-response, with varying results. First, Dewar et al. (2020) showed an influence of age on non-response, with non-responders tending to be older. Other studies have reported mixed findings (Fonzo et al., 2020; Paiva et al., 2022) or found no association (Barawi et al., 2020). Second, male gender has been found to be associated with non-response in some reviews and meta-analyses (Fonzo et al., 2020; Wade et al., 2016). While efficacy meta-analyses supported these findings (Watts et al., 2013), other studies could not confirm them (Barawi et al., 2020; Dewar et al., 2020). In addition, inconsistent findings have been reported regarding other variables such as education, employment, and marital status, rather indicating no influence of these variables on non-response (Barawi et al., 2020; Fonzo et al., 2020; Paiva et al., 2022).

In addition, it is important to consider clinical variables. Research has consistently shown that higher severity of PTSD symptoms predicted non-response (Barawi et al., 2020; Dewar et al., 2020; Fonzo et al., 2020), although a few reviews have reported mixed findings

(Paiva et al., 2022; Schottenbauer et al., 2008). In addition to PTSD severity, the type of trauma experienced may also influence response to treatment. Dewar et al. (2020) found higher rates of non-response in individuals with combat-related trauma. Fonzo et al. (2020) identified exposure to repeated interpersonal trauma, including childhood trauma, as associated with non-response. The presence of comorbid disorders is also an important factor, with strong evidence indicating that comorbid depression can affect non-response rates (e.g., Barawi et al., 2020; Dewar et al., 2020; Fonzo et al., 2020). Furthermore, the comorbidity with anxiety disorder or substance use disorder (SUD) seems to affect non-response (Dewar et al., 2020; Fonzo et al., 2020).

Treatment variables

The influence of specific treatment characteristics on the occurrence of non-response is rarely studied (Barawi et al., 2020). Therefore, findings usually have to be derived theoretically from efficacy analyses. The tolerability of trauma-focused treatments and thus the influence of treatment type on non-response is often discussed (Dewar et al., 2020). Dewar et al. (2020) reported that a large number of studies investigating exposure treatment reported higher non-response rates. However, trauma-focused treatments are the main guideline-recommended treatments due to substantial evidence for their efficacy (e.g., American Psychological Association, 2017; Watts et al., 2013). Current research has also examined the comparative efficacy of different trauma-focused treatment types, with mixed findings. While some meta-analyses postulate comparable efficacy (e.g., Watts et al., 2013), others have found differences (e.g., Jericho et al., 2022). Currently, there are no findings regarding the influence of different trauma-focused treatment types on non-response. In addition, other treatment characteristics may influence treatment outcome. Cahill and Foa (2004) have previously discussed the impact of the number of treatment sessions on response rates and postulated that a higher number of sessions is related to better treatment response. However, more recent meta-analyses have found

no such influence on treatment outcomes (Barawi et al., 2020; McLean et al., 2022). Treatment format has also been frequently discussed in efficacy studies, with evidence pointing to the superiority of individual therapy despite the efficacy of group treatment. However, there is a lack of findings on non-response. Last, homework adherence has been identified as important factor for treatment outcome in trauma-focused treatments (e.g., Barawi et al., 2020; Cooper et al., 2017; Stirman et al., 2018).

Therapist variables

In the treatment of PTSD, there has been limited attention given to the association between therapist variables and treatment outcome, as well as non-response. Research suggested that therapist experience level (Ehlers et al., 2013; Goodson et al., 2017) and the quality of the therapeutic relationship (Paiva et al., 2022) have a positive impact on treatment outcomes. However, there is still a lack of research on non-response.

Study variables

Given the differences in the definition and operationalization of non-response, it becomes evident that the choice of operationalization method may have an impact on the non-response rates. Bradley et al (2005) found different response rates when comparing loss of PTSD diagnosis and clinically significant improvement, as defined by the authors of the study. Interestingly higher response rates were found when loss of diagnosis was used to operationalize response. However, although the issue of consistent operationalization criteria is receiving more attention in PTSD treatment (Larsen et al., 2020; Varker et al., 2020), research examining the influence of operationalization type on non-response is still lacking.

1.4 Aims of the thesis

The objective of this thesis was to comprehensively understand the complexity of treatment failure in traumatized populations, with a particular focus on dropout and non-response. Despite the existence of evidence-based interventions for traumatized populations, typically suffering from PTSD, a substantial proportion of patients does not benefit sufficiently from treatment or discontinues the treatment prematurely. The consequences of treatment failure for patients, therapists, society, and the healthcare system are well-known. However, dropout and non-response have received little attention in trauma treatment research. Therefore, there is a significant lack of research on treatment failure in the treatment of PTSD in general, but also, if not especially, in the treatment of specific subpopulations, such as refugees, and in the consideration of specific treatment settings. To achieve an in-depth understanding, it is necessary to investigate the prevalence and predictors of dropout and non-response. It is precisely this research gap that I aim to address in this thesis. Therefore, the overarching aim of this thesis was to create a comprehensive understanding of the complexity of treatment failure by generating novel knowledge on the prevalence and predictors of dropout and non-response in the treatment of traumatized populations. The four publications serve to accomplish this aim. Three of these publications examined the prevalence and predictors of dropout in under-researched areas, namely refugees and PTSD treatment in a naturalistic treatment setting. The fourth study applied the same research question to non-response in the treatment of PTSD.

Publication I and *Publication II* investigated the prevalence and predictors of dropout in the treatment of refugees and asylum seekers. Refugees are considered to be a highly burdened, mostly multi-traumatized population, whose treatment poses specific challenges that may influence treatment dropout. The aim of both publications was therefore to provide initial findings on dropout in the treatment of refugees. Since there is currently no evidence on dropout in the treatment of refugees, the initial step was to generate knowledge through a practice-oriented review. Therefore, the aim of *Publication I* was to conduct a review on the existing

evidence on the prevalence and predictors of dropout among refugees. In the absence of evidence-based research, the review synthesized refugee-specific findings but additionally reviewed the existing evidence on treatment dropout in general and applied the findings to the refugee population. In order to increase the practical relevance of the review, the findings on prevalence and predictors of dropout were supplemented by a review of measures to prevent dropout. Building on this, *Publication II* provided the first quantitative synthesis of the prevalence and predictors of dropout in treatment of refugees. By meta-analyzing data from 28 eligible RCTs, this study was the first to estimate the prevalence of dropout among refugees and to examine study, sample, treatment, and therapist characteristics as potential predictors of dropout. This meta-analysis extends previous research on dropout in PTSD treatment and provides a novel insight into the treatment of refugees that has not been previously examined.

In addition to the lack of research on treatment dropout in specific subpopulations of traumatized patients, little attention has been paid to specific treatment settings. The majority of research examined PTSD treatment dropout in RCTs, and findings on dropout in naturalistic treatment settings are scarce. Since transferring results from efficacy trials to naturalistic settings can be problematic, the aim of *Publication III* was to investigate dropout rates and predictors of dropout in the treatment of PTSD in naturalistic settings. The study examined the dropout rate and the prediction of dropout by specific patient variables (sociodemographics and PTSD-specific clinical variables) and therapist characteristics in 195 adults diagnosed with PTSD receiving trauma-focused CBT at three outpatient centers. This study adds important findings to the existing research on PTSD treatment dropout in RCTs.

A comprehensive understanding of treatment failure in traumatized populations includes not only the consideration of dropout but also of another common phenomenon, namely non-response. Although a substantial proportion of PTSD patients does not respond to evidence-based psychological treatments, there is a lack of research on non-response, particularly its definition, operationalization, and most importantly, its prevalence and predictors.

Publication IV represents the first meta-analysis on the prevalence and predictors of non-response to psychological treatment for PTSD. The pooled evidence from 86 RCTs provides an estimate of the prevalence of non-response and allows an identification of treatment non-response predictors among possible study, patient, treatment, and therapist variables. Given the lack of comprehensive research on the prevalence and predictors of non-response to PTSD treatment, the findings of this meta-analysis are a significant contribution to an expansion of the research on treatment failure in traumatized populations.

2 Cumulative Publications of the Thesis

Publication I:

Predicting and Preventing Dropout in Research, Assessment and Treatment with Refugees

This chapter is a post-peer-review, pre-copyedit version of an article published in *Clinical Psychology & Psychotherapy*.

Semmlinger, V., & Ehring, T. (2022). Predicting and preventing dropout in research, assessment and treatment with refugees. *Clinical Psychology & Psychotherapy*, 29(3), 767–782. https://doi.org/10.1002/cpp.2672

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Predicting and Preventing Dropout in Research, Assessment and Treatment with Refugees

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Author Note

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Abstract

Refugees and asylum seekers are exposed to multiple burdensome experiences and suffer from ongoing post-migration stressors that are known to affect the physical and mental health. In psychological treatment offered to refugees and asylum seekers dropout is an important challenge. The current practice-oriented review aims to provide for the first time knowledge on the prevalence, prediction, and prevention of dropout in psychological treatment for refugees and asylum seekers. Due to the limited empirical evidence for this specific population, we synthesized refugee-specific research but also reviewed the existing evidence on dropout from treatment in general, and specifically discuss how the findings can be adapted to refugee populations. The review integrates literature from online databases, grey literature, hand search, and expert contacts. Prevalence rates of dropout from psychological treatment in Western samples are reported at about 20%. For refugees and asylum seekers evidence from single efficacy trials showed considerable variability in dropout rates (0%-64.7%). Further, for refugees and asylum seekers specific sociodemographic variables, high initial impairment, deviating expectations and perceptions of mental health and psychological treatment, as well as external barriers seem to be important predictors for dropout. To prevent dropout, it is important to develop and promote cultural competencies, adapt the treatment to refugee-specific needs, and focus on role induction, preparation for treatment, fostering the therapeutic alliance, and strengthening hope. Future specific research on dropout in treatment offered to refugees and asylum seekers is needed.

Keywords: Treatment Dropout, Refugee, Prediction, Prevention, Recommendations

Key Practitioner Message

- Dropout is an important challenge in treatment offered to refugees and asylum seekers
- First practice-oriented review on prevalence, predictors, and prevention of dropout in treatment for refugees and asylum seekers
- Prevalence rate of 20% for psychological treatment dropout; evidence for refugees only from single efficacy trials (0%-64.7%)
- Sociodemographic variables, initial impairment, culture-related expectations and perceptions, and external barriers as important predictors for dropout
- Promote cultural competencies, adapt treatment to specific needs, focus on preparation and therapeutic alliance to prevent dropout.

Predicting and Preventing Dropout in Research, Assessment and Treatment with Refugees

Millions of people are forced to flee their home country due to war, persecution, conflicts, or human rights violations. According to the latest report of the United Nation High Commissioner for Refugees (UNHCR), at the end of 2019 there were 79.5 million forcibly displaced people worldwide (United Nation High Commissioner for Refugees, 2020). This figure includes 26 million refugees (UNHCR and United Nations Relief and Works Agency's (UNRWA) mandate) and 4.2 asylum seekers worldwide (United Nation High Commissioner for Refugees, 2020). The majority of refugees (68%) worldwide come from Syria, Venezuela, Afghanistan, South Sudan, and Myanmar (United Nation High Commissioner for Refugees, 2020).

Refugees and asylum seekers face a number of stressful events and threatening experiences. These include experiences prior to migration such as persecution, traumatic bereavements, sexual violence, modern slavery, and multiple burdensome experiences caused by armed conflicts, war, torture, or economic hardship (Bogic et al., 2012; Böttche et al., 2016; Hargreaves, 2002; Hollifield et al., 2002; Kalt et al., 2013; Priebe et al., 2016; Such et al., 2019). During the displacement process refugees and asylum seekers might face physical harm, life-threatening conditions, human trafficking, and separation from family members (Böttche et al., 2016; Priebe et al., 2016; Ryan et al., 2008). Furthermore, resettling in a new country can provoke various post-migration stressors. These include a challenging accommodation situation, poor socio-economic conditions, uncertainty, fear of detention, experiences of discrimination, language difficulties, social isolation, or complications in the asylum-application process and feelings of ambiguous loss (Böttche et al., 2016; Liedl et al., 2016; Porter & Haslam, 2005; Priebe et al., 2016; A. Renner et al., 2021).

The exposure to pre-, peri- and post-migration stressors causes a burden that might affect the physical as well as the mental health of refugees and asylum seekers. There is strong research evidence indicating considerable rates of psychological disorders among this population (Nickerson et al., 2011).

In the current literature there is vast evidence of increased prevalence rates for PTSD, depression, and anxiety disorders in refugees and asylum seekers, despite substantial variability in the reported prevalence rates between studies. Table 1.1 provides an overview of recent studies on the prevalence of PTSD, depression, and anxiety disorders among refugees and asylum seekers. A distinction was made between overall prevalence rates, as well as specific countries of origin and countries of resettlement.

Table 1.1

Prevalence of mental disorders in refugees and asylum seekers

	PTSD	Depression	Anxiety
Overall			
Various conflicted areas & regions of origin			
Blackmore et al. (2020)	31.5 %	31.5%	11.0%
	5%-63%	1%-58%	2%-39%
Steel et al. (2009)	30.6%	30.8%	
	0%-99%	3%-86%	
Turrini et al. (2017)	0-99%	2-100%	2-100%
Specific[1]			
Country of origin			
Syria			
Alpak et al. (2015)	33.5%	/	/
Gammouh et al. (2015)	/	29.5%	/
Kazour et al. (2017)	27.2%	/	/
Iraq			
Tekin et al. (2016)	42.9%	39.5%	/
Kizilhan (2018)	48.6%	53.4%	39.1%
Country of resettlement			
Low- /Middle-income			
Turrini et al. (2017)	0.2-76.5%	2-89.5%	4-81.6%
High-income			
Turrini et al. (2017)	3-54%	3-100%	12-77%
Slewa-Younan et al. (2015)	25%	43%	/
Fazel et al (2005)	9%	5%	4%

Note. PTSD: Post-Traumatic Stress Disorder

[1]Examples given

The presence of mental health burdens among refugees and asylum seekers results in a substantial demand of adapted and effective mental health interventions and treatment services for this group. Various psychological or psychosocial interventions for refugees and asylum seekers have been developed over the past decades and their effectiveness has been examined, with the majority of studies focusing on PTSD symptoms. The current evidence shows promising results on the effectiveness of these interventions for PTSD, depression, and anxiety (Crumlish & O'Rourke, 2010; Kip et al., 2020; J. E. Lambert & Alhassoon, 2015; Nose et al., 2017; Palic & Elklit, 2011; Thompson et al., 2018; Tribe et al., 2019; Turrini et al., 2019). Note, however, that the promising findings are not consistent. Although the overall effect size of $g = 0.77$ for PTSD and $g = 0.82$ for depression in the most recent meta-analysis by Kip et al. (2020) were promising, the authors emphasized the considerable heterogeneity in included studies.

When evaluating treatments for refugees, it appears important not only to evaluate the efficacy of treatment effects on symptom reduction. Instead, the acceptability, feasibility and availability of treatments are important additional outcomes. Can refugees with mental health problems gain access to treatment? Do their symptoms improve? But also, do individuals remain in a planned treatment? How frequently do refugees drop out of treatment?

Despite the growing body of literature on the effectiveness of psychological interventions for refugees and asylum seekers, the empirical research on dropout is limited. In studies reporting dropout rates in refugees receiving psychosocial treatment, this variable has most frequently been assessed as a secondary outcome only and/or investigated in additional post-hoc analyses of data sets that were mainly focused on evaluating treatment efficacy. To our knowledge, there is currently no published systematic review or meta-analysis assessing the prevalence, predictors, or established preventive measures for dropout in psychological or psychosocial interventions for refugees and asylum seekers.

Relevance of considering dropout in research and treatment

Premature termination of psychological treatment can cause various adverse consequences for the patients, the therapist as well as the public healthcare system. Considering the negative consequences for patients dropping out of treatment, there is a reduced probability of improvement in the psychosocial functional level and in the symptoms that led them to seek treatment (Bjork et al., 2009; Cahill et al., 2003; Swift et al., 2012). Refugees and asylum seekers often suffer from a pronounced symptomatology due to an accumulation of a burdening index traumatization in the country of origin, negative flight experiences, and post-migration stressors (uncertain asylum status, long-term accommodation in communal shelters). A premature termination of treatment and an associated symptom aggravation can therefore cause severe consequences for the patients (e.g., suicide attempts) or a chronification of the PTSD (Fazel et al., 2005; Liedl et al., 2016; Nickerson et al., 2011). Furthermore, most patients who have decided to drop out of a therapy stated that they have been very dissatisfied with the therapy (Bjork et al., 2009). In addition, premature termination of treatment can also affect the therapist. Several authors highlight the long-term complex and persistent effects of therapy discontinuation on the therapist. As a fundamental stressor for the therapist (Farber, 1983), premature discontinuation of therapy can lead to a reduction in self-esteem and to feelings of frustration, failure, and rejection (Ogrodniczuk et al., 2005; Piselli et al., 2011). Additionally, the burden of multiple therapy dropouts on the mental health system must not be forgotten. The premature discontinuation of therapy affects the health care system on several levels (Barrett et al., 2008). These include the additional strain on already scarce resources, especially for the treatment of refugees and asylum seekers, and the ongoing costs to the health care system caused by a prolonged illness (Barrett et al., 2008; Parsonage, 2003; Swift et al., 2012).

In view of the negative consequences of premature discontinuation of therapy, it is of great importance to take a comprehensive look at the phenomenon of dropout. In addition to establishing the prevalence of patients' dropping out from treatment, it appears of particular

interest to identify predictors and risk factors for dropout, and develop strategies for the reduction of dropout in research and practice. Although systematic reviews and meta-analyses on these phenomena are emerging see e.g. Swift & Greenberg (2012) for an influential large-scale review, reviews specially focusing on dropout in research, assessment and treatment of refugees and asylum seekers are missing.

The current article aims to provide, for the first time, a practice-oriented review on dropout in the treatment of refugees that is useful for researchers and practitioners providing and/or investigating psychological treatment for refugees based on the best available empirical evidence. As there is currently extremely limited empirical evidence on the prevalence, prediction, and prevention of dropout in this specific population as hardly any study has specifically addressed this issue, we review the literature on dropout from treatment in general, and specifically discuss how the findings can be adapted to refugee populations.

Background

Definition of dropout

There is currently no consensus in the literature on the definition of dropout. Many authors define dropout as the termination of an initiated treatment before the problems (symptoms, impairment of the functional level, suffering) that had led to the start of the intervention have been alleviated (Garfield, 1994; Hatchett & Park, 2003; Swift et al., 2009; Swift & Greenberg, 2012). Swift and Greenberg (2012) have specified this broad definition. According to the authors, dropout implies a termination of the treatment without fulfilment of the therapeutic goals, without attainment of the full therapeutic benefit that would have been possible with normal termination of the therapy or without completion of the full scope of the therapy (see Table 1.2). It is important that the decision on the termination of the treatment is made exclusively by the patient and without mutual consent (Horner & Diamond, 1996; Swift & Greenberg, 2012).

Other authors just concentrate on parts of this specific definition made by Swift and Greenberg (2012). Thus, some speak of dropout when a planned therapy duration, i.e., a fixed number of therapy sessions or a fixed duration in months, cannot be achieved (e.g. Beckham, 1992; Gunderson et al., 1989). Others focus on fulfilling the treatment protocol (e.g. Maher et al., 2010), or define dropout as a non-appearance at two consecutive scheduled sessions or the last scheduled session (e.g. Hatchett et al., 2002; Kolb et al., 1985). Importantly, in all definitions, dropout is distinguished from regular termination of treatment and the refusal of therapy (Garfield, 1994).

To operationalize dropout, studies use different methods based on the definition used by the respective authors (see Table 1.2 for an overview). First, a specific number of therapy sessions can be defined, which is considered the minimum therapy dose for symptom improvement. Failure to meet this minimum number is then considered a dropout (M. J. Lambert, 2007; Swift & Greenberg, 2012). Second, a different operationalization considers failure to comply with the treatment protocol to be decisive, i.e., anyone who does not comply with the entire protocol is counted as a dropout (Swift & Greenberg, 2012). Third, dropout is sometimes operationally defined as any instance where a patient misses a scheduled therapy session without rescheduling it or coming to further sessions (Swift & Greenberg, 2012). Forth, there is an operationalization method purely focusing on the therapist's judgement, i.e., after treatment termination, the therapist decides whether the therapy is considered prematurely terminated (Swift & Greenberg, 2012). Fifth, decision making on dropout can be based on clinical significance. Dropout is any discontinuation of therapy without demonstrable improvement and without achieving a score in the normal range during the outcome measurement (Hatchett & Park, 2003).

The choice of a particular method of operationalizing dropout depends on the setting and the goal of the study or treatment and each has a different set of advantages and disadvantages. While, for example, in the natural therapy setting, duration-based

operationalization methods such as a minimal therapy dose (point 1) or the completion of a treatment protocol (point 2) may seem problematic in some cases, it is advisable in RCTs with a predetermined number of treatment sessions (Zimmermann, 2016).

Wierzbicki and Pekarik (1993) advocated the therapist's judgment as the preferred operationalization method for dropout. In contrast, Swift and Greenberg (2012) abstained from favoring one specific method; instead they recommended a combination of two types of operationalization, for example combining the therapist's judgement with a more objective technique. However, they emphasized the importance for the field to start using a uniform definition and operationalization method for dropout (Swift & Greenberg, 2012).

It should be noted that the variability in the definition and operationalization of dropout across studies makes it difficult to compare and interpret findings.

Based on the current literature, the need to develop a common standard for assessing, reporting, and handling dropout in refugees and asylum seekers is emphasized. At the same time, it is important to allow some flexibility in the choice of the method, depending on the purpose and context for assessing dropout. As general classifications (e.g., duration of treatment) do not apply for every patient and therapeutic process and the therapist, in contrast, can make an individual decision, therapist judgement has been the preferred operationalization method for many years (Swift & Greenberg, 2012; Wierzbicki & Pekarik, 1993). However, some studies found limitations of an operationalization based on therapist judgement in the lack of reliability and comparability of the criteria used for judgement (Garb, 2004; O'Keeffe et al., 2019). We therefore recommend a combination of therapist judgement and objective measures, i.e., the therapist bases the decision on both, the personal assessment as well as an objective outcome monitoring (clinically significant change). This method is recommendable for clinical practice. In clinical research, where a high comparability of findings across studies is desired, we recommend a duration- or dose-based operationalization method, i.e., defining a specified number of sessions that need to be attended to be classified as a completer. Due to the lack of

empirical evidence on dropout in the treatment of refugees, evidence-based recommendations can only be derived from general knowledge. We therefore recommend to transfer the knowledge from non-refugee samples to the refugee population in this case.

Table 1.2

Definition and operationalization of dropout

Definitions of dropout [a]	
Dropout is termination of treatment without, …	
	fulfillment of a therapeutic goal attainment of full therapeutic benefit completion of the full scope of therapy
Definition	Operationalization methods
Duration-based/ minimum dose	Fixed number of therapy sessions
Treatment protocol	Failure to comply the entire treatment protocol
Missed appointments	Miss of a scheduled therapy session without rescheduling or coming to further sessions
Therapist judgement	Dropout decision based on the therapist's judgement
Clinical significance	Termination of therapy without clinically significant improvement and without achieving a score in the normal range during outcome measure

Note. [a] (Swift & Greenberg, 2012)

Prevalence of dropout

A number of meta-analyses have been published reporting on the prevalence of dropout from psychological treatment.

Wierzbicki and Pekarik (1993) conducted the first comprehensive, systematic statistical review of dropout rates in psychological treatment. Across 125 studies they determined an average dropout rate of 46.86% (95% CI = [42.9% - 50.82%]), which is in line with earlier reviews consistently reporting a dropout rate in the range of 50% (Baekeland & Lundwall, 1975; Garfield, 1994; Wierzbicki & Pekarik, 1993). More recent meta-analyses, on the other hand, paint a slightly different picture. In their large-scale meta-analysis on dropout from

psychological treatment with 669 included studies and a total of 83,834 examined adult patients, Swift and Greenberg (2012) reported a weighted mean dropout rate of 19.7% (95 % CI [18.7% - 20.7%]). However, there was a high degree of heterogeneity among the included studies, with dropout rates ranging from 0% to 74.23% (Swift & Greenberg, 2012). Other recent comprehensive reviews are in line with these findings. For example, in a meta-analysis conducted by Fernandez et al. (2015) the average dropout rate was 26.2% and in a recent review aiming at a comparison between psychological treatment and pharmacotherapy Swift et al. (2017) found an overall treatment dropout rate of 21.9%.

The dropout rate appears to be moderated by the diagnosis of the client. Studies with no specification of the treatment-focus on one diagnosis, or with a treatment-focus on a non-classified category reported the highest dropout rates (27.7%) (Swift & Greenberg, 2012). Second and third largest dropout rates could be found for personality disorder treatments (25.6%) and eating disorder therapy (23.9%). Further meta-analysis, concentrating on the treatment dropout in specific groups of patients reported, for example, an average dropout rate of 37% in personality disorder treatments (McMurran et al., 2010), or a dropout rate of 18.28% in treatments for PTSD in general and 36% for trauma-specific treatments (Imel et al., 2013).

Some analyses have also examined whether dropout rates are related to specific treatment approaches. There is some evidence showing significant differences in dropout between treatment approaches only in the context of depression, eating disorders and PTSD (Swift & Greenberg, 2014). For depression and PTSD, the lowest dropout rate (10.9% for depression and 8.8% for PTSD) was reported in integrative approaches that combined several techniques without referring to one broad orientation such as cognitive-behavioral or psychodynamic. Dialectical-behavior therapy (DBT) resulted in the lowest dropout rate for eating disorders (5.9%). For the remaining nine diagnostic categories examined, no significant difference in dropout rates for the separate approaches could be detected, indicating that general

therapeutic treatment factors (e.g. therapeutic alliance), rather than specific methods might be decisive for retention in treatment (Swift & Greenberg, 2012, 2014).

As the current research on dropout almost exclusively focuses on non-refugee samples and reviews and meta-analysis are still missing, the actual dropout rate in treatment of refugees and asylum seekers is largely unknown. Therefore, at the current state evidence can only be drawn from inferences of the non-refugee literature or single treatment efficacy trials. Treatment efficacy trials with refugees and asylum seekers have shown a considerable variability in reported dropout rates. They ranged from 0% in e.g., Hinton et al.'s (2004, 2005, 2009) RCTs on the efficacy of CBT for Vietnamese and Cambodian refugees with PTSD, to 64.7% reported in W. Renner et al. (2011) for EMDR to reduce post-traumatic symptoms in Chechen refugees and asylum seekers.

Scope of the Review

The present literature review focuses specifically on dropout in treatment offered to refugees and asylum seekers. The objectives of the review therefore are, on the one hand, to synthesize refugee-specific research findings, but, on the other hand, to also discuss how to translate findings on dropout obtained in Western non-refugee samples to the refugee population. Rather than providing a systematic review on research findings, the current article was written as a practice-oriented review with the aim to make suggestions on how to improve treatment adherence and to help clinicians working with refugees to implement preventive measures to reduce dropout. To the best of our knowledge, the present review is the first discussing dropout in refugees and asylum seekers, and it focused on the following questions. What is the current evidence on prevalence, prediction, and prevention of dropout from psychological treatment in general, i.e., not specific to refugee populations? How can this general knowledge be translated to the prediction and prevention of dropout in the treatment of refugees and asylum seekers, taking into account specific characteristics of this population?

What recommendations can be derived for clinicians working with refugees and asylum seekers?

The review integrates literature retrieved from online databases (PubMed, PsycInfo, GoogleScholar), grey literature, hand searches of relevant websites (such as UNHCR), personal contacts with experts on workshops, and reference lists of yielded key articles. We considered literature from three major thematic fields, namely (1) literature on dropout from psychological treatment in general, (i.e., prevalence, predictors, preventive measures); (2) literature on psychological treatment with refugees and asylum seekers in general, (i.e., mental health, cultural-specific aspects, treatment offers); (3) literature on dropout from treatment offered to refugees and asylum seekers. Primary keywords included *psychological treatment*, *dropout, attrition, refugee, asylum seeker, mental health, post-traumatic stress, treatment barriers, cultural competencies*. The main literature search was completed in September 2020.

Predictors and subjective reasons for dropout

For a more comprehensive understanding of the phenomenon and in order to develop strategies that can reduce its occurrence, it is essential to understand the variables that lead to premature discontinuation of psychological treatment.

The existent empirical evidence on predictors of and reasons for dropout is almost exclusively focused on Western non-refugee populations. In contrast, to the best of our knowledge there is currently no evidence-based research on dropout in the treatment offered to refugees and asylum seekers. It is conceivable that many variables identified in Western populations also apply to this specific population. Therefore, current evidence from treatment of Western non-refugee patients is reviewed and implications for the refugee population are discussed. Further, it appears likely that additional, refugee-specific factors need to be considered. These will be reviewed based on the current knowledge from reports of clinical practitioners as well as theoretical assumptions.

While the individual aspects are initially described in detail, they are summarized in tabular form at the end of this chapter (see Table 1.3).

Predictors for dropout

Patient variables

In their large scale meta-analysis, Swift and Greenberg (2012) found patients' age and diagnosis to significantly predict dropout, with higher dropout rates in younger patients and patients with personality disorders or eating disorders. In contrast, no significant differences in dropout rates could be found for patients' ethnicity or employment status. There were conflicting findings regarding the influence of educational level, gender, and marital status (Swift & Greenberg, 2012). While some reviews are in line with the findings, i.e., higher dropout in younger patients (Barrett et al., 2008; Winkler, 2018) and patients with personality disorder (Cinkaya, 2016; McMurran et al., 2010; Zimmermann et al., 2017), some authors could not confirm Swift and Greenberg's (2012) findings, e.g. the association with age (Zimmermann et al., 2017). However, Zimmermann et al. (2017) reported a significant impact of gender (more dropout in male patients) and level of education (higher dropout in less educated) (see Table 1.3 for an overview).

Barrett et al. (2008) and Zimmermann et al. (2017) pointed out the influence of high initial impairment, that is the severity and complexity of diagnoses on dropout rates. Due to their various adverse pre-, peri-, and post-migration experiences, refugees and asylum seekers often suffer from a high impairment that might influence the risk of premature termination of dropout (Fazel et al., 2005; Liedl et al., 2016; Nickerson et al., 2011; Priebe et al., 2016).

Further, the level of psychological mindedness (negative correlation with dropout), as well as positive perception of mental health and mental health treatment (negative correlation with dropout), and current treatment expectation were associated with the dropout rates (Barrett et al., 2008; Zimmermann et al., 2017).

In the treatment offered to refugees and asylum seekers, perceptions of mental health and mental health treatment are also conceived to influence the treatment outcome and therefore the dropout rate. According to numerous studies, there is evidence for cultural differences in the perception of, thoughts about, and beliefs related to mental illness and psychological treatments (Barrett et al., 2008). While Western aetiological models are typically known to be accepted by refugee populations for physical disorders, Liedl et al. (2016) suggested that refugees tend to use traditional, culture-specific assumptions when explaining mental disorders. The cause of the illness is then seen, for example, in external circumstances like "the evil eye", "the curse of fellow human beings", or the "intervention of the ancestors" (Liedl et al., 2016). Furthermore, several authors assumed that in many cultures there is no body-soul dualism, both mental and physical pain is experienced holistically (Ebner, 2001; Liedl et al., 2016). In addition, a number of studies have suggested that the socialization of individuals can influence the perception of their own mental state and the associated need for therapeutic support (Barrett et al., 2008). If one looks at African cultures, for example, there is a socialization-related tendency among African women to have to act as strong caregivers (Boyd-Franklin, 2013). This includes the feeling of being solely responsible for the needs of the family and thus reduces the probability of accepting external help. At the same time, men tend to be educated to suppress or hide their feelings (Boyd-Franklin, 2013). Unfortunately, there is insufficient research on the influence of the perception of mental illnesses on the probability of dropout in refugees. If at all, this factor is only investigated in the context of stigmatization, yet again the results are inconsistent (Barrett et al., 2008).

Treatment variables

A number of variables related to the treatment provided are potentially predictive for dropout (see Table 1.3). Swift and Greenberg (2012) reported significantly higher dropout rates in treatments with unfixed (vs. fixed) number of sessions, lower degree of manualization, and in university-based institutions. No significant difference cloud be found between treatment

orientation and treatment format (group, individual). However, Swift and Greenberg (2014) showed that the influence of treatment orientation on dropout rates was moderated by disorder, with significant differences in dropout rates between treatment orientations for depression, PTSD, and eating disorder.

Among refugees and asylum seekers, high prevalence rates of PTSD and depression can be identified (Fazel et al., 2005; Nickerson et al., 2011). It is therefore important to consider dropout rates in treatment of PTSD and depression. Swift and Greenberg (2014) showed that integrative treatment approaches resulted in the lowest dropout rates for depression (10.9%) and PTSD (8.8%). In contrast, for example CBT resulted in dropout rates of 28.5% for PTSD and 20.4% for depression. Note that Imel et al. (2013) cloud not find any differences in dropout rates in PTSD treatments when controlling for between study differences. Further, the degree of trauma focuses within a treatment did not predict dropout rates, contradicting the assumption that trauma focused therapies, like exposure, predict dropout.

In addition, Barrett et al. (2008) showed that treatment barriers had a significant influence on the probability of terminating therapy prematurely. The authors referred to earlier studies hypothesizing difficulties in finding a therapy, a long waiting list, as well as long commutes to therapy locations as possible predictors of dropout.

Treatment barriers can be considered an important factor that might influence the risk of dropout in the treatment of refugees and asylum seekers, as they are situated in demanding living conditions and face specific challenges, which can be seen as additional obstacles that make it difficult to remain in therapy. Slobodin and de Jong (2015) hypothesized that language barriers and communication difficulties as well as frequently changing residences and contact details may increase the probability of dropout. Furthermore, refugees and asylum seekers often have limited economic resources. Some mental health care professionals assume that this could also influence the acceptance of psychotherapeutic treatment offers (Sandhu et al., 2013). Considering the difficulties these individuals or families face every day, it is clear that it may

be difficult to attend psychological treatment regularly, if daily care for children is not guaranteed, or if one may not miss a day at work without the risk of dismissal, just to give a few examples. Many refugees and asylum seekers further lost their social environment due to resettling in another country. Several authors argue that the lack of support through social contacts, the feelings of loneliness, isolation and homesickness can lead to a sense of helplessness and fear of marginalization that may enhance the possibility of dropout (Liedl et al., 2016; Sandhu et al., 2013). Furthermore, a rejected asylum application can, in case of an associated deportation, also inevitably lead to premature termination of therapy (Slobodin & de Jong, 2015). Often, these specific burdens can be summarized under the terms of post-migration stressors explained above. In several reviews the authors have assumed that while the presence of post-migration stressors on the one hand increases the psychological burden and thus the need for therapeutic support, they can also be seen as obstacles to remaining in therapy (Böttche et al., 2016; Porter & Haslam, 2005; Priebe et al., 2016).

Therapist-/ provider variables

Level of therapist experience had been shown to be a predictor of dropout, with higher dropout rates when therapists had a lower level of experience (Swift & Greenberg, 2012). In contrast, neither therapists' age, nor gender, or race was predictive for dropout. These findings could be confirmed by Roos and Werbart (2013). In addition, the impact of the quality of the therapeutic alliance should be emphasized. A large number of studies can be identified that have found a connection between strength of the therapeutic alliance and dropout probability, with weaker alliances tending to predict dropout (Cinkaya, 2016; Roos & Werbart, 2013; Sharf et al., 2010).

The essential aspect of the therapeutic alliance is the relationship and interaction between therapist and patient. In the treatment offered to refugees and asylum seekers building this alliance may be associated with some difficulties. In their qualitative study with 48 interviewed mental health care professionals in 16 European countries, Sandhu et al. (2013)

found that many therapists stated that patients from other cultures have difficulties in building trust. This was due to both, previous negative experiences with authorities and the unfamiliarity with the health care system. These results were supported by Priebe et al. (2016) who reviewed the results of several studies giving evidence for a lack in gaining trust towards health care professionals among refuges and asylum seekers.

Further, Zimmermann et al. (2017) underlined the importance of the so-called therapist effect when examining dropout. In their study, they reported that 5.7% of the variance in dropout could be explained through therapist differences (therapist effect).

Study and design variables

In addition to variables related to characteristics of patients, therapists, or the therapy itself, it is further interesting to consider the study design, i.e., how the dropout rate is influenced by methodological factors, such as type and conduct of studies (see Table 1.3).

Swift and Greenberg (2012) demonstrated that dropout rates were significantly moderated by the definition of dropout used in the studies, with the highest dropout rates for therapist judgment. These results are in line with the findings reported by Wierzbicki and Pekarik (1993) or Hatchett and Park (2003). Furthermore, study type had a significant influence on determined rates of dropout (Swift & Greenberg, 2012). The dropout rates reported by studies of treatment effectiveness were significantly higher than those reported from studies focusing on efficacy. In contrast, there was no significant effect of the publication year of studies.

Subjective reasons for dropout

While a growing body of research is examining predictors for dropout, comparatively little is known about subjective reasons reported by patients for their dropping out of treatment (for an overview, see Table 1.3). Insufficient motivation for therapy and/ or for change proved to be the most frequent reason for discontinuation documented by therapists (Cinkaya, 2016).

Therapists also reported that patients often suddenly stop attending therapy session and no further contact is possible, therefore reasons for discontinuation often remain unknown.

Patients, on the other hand, frequently reported dissatisfaction with the therapist and the therapy as reasons for dropout (Pekarik, 1992; Westmacott et al., 2010). Various authors stated that the different expectations of treatment held by patients from other cultural backgrounds can lead to dissatisfaction and influence the occurrence of dropout from psychological treatment (e.g., Priebe et al., 2016; Sandhu et al., 2013; Slobodin & de Jong, 2015; van Loon et al., 2011). This attitude towards psychological treatment appears to be influenced by socialization and cultural differences as well (Barrett et al., 2008; Priebe et al., 2016). Liedl et al. (2016) suggested for example, that traumatized refugees expect a medically or spiritually oriented therapy method that also leads to an improvement of their living conditions they consider the cause of their symptoms. Furthermore, "talking as a method of healing" is a mostly unknown concept, so the authors. In order to avoid disappointment, a comprehensive explanation of the therapy method as well as the clarification of the individual therapy expectation is therefore indispensable in treatment offered to refugees and asylum seekers (Liedl et al., 2016).

In addition, in their qualitative analysis of patient interviews on premature termination, Knox et al. (2011) reported unresolvable ruptures between patients and therapists as frequently cited reasons for dropout from a patients' perspective. Given the difficulties in gaining trust towards health care professionals among refugees and asylum seekers (Priebe et al., 2016; Sandhu et al., 2013), it is conceivable that a break in a hard-won therapeutic relationship could have an impact on the likelihood of premature treatment discontinuation.

Further, patients frequently indicated external barriers as reasons for a premature termination of treatment (Knox et al., 2011; Pekarik, 1992; Westmacott et al., 2010). As stated before, refugees and asylum seekers face numerous external barriers, e.g., language barriers, communication difficulties, high frequency in changing residence and contact details, that my increase the likelihood of dropout.

In contrast, it should be emphasized that Westmacott et al. (2010) also described that some patients terminated therapy prematurely because they had already been satisfied with the therapeutic progress.

According to Swift and Greenberg (2012), these different reasons for premature termination of therapy can be understood as the result of a cost-benefit calculation. In this calculation, the patient compares the perceived and anticipated costs of continuing the therapy with the perceived and anticipated benefits of the therapy. If the costs exceed the anticipated benefit, dropout becomes more likely.

Table 1.3

Key findings on predictors and subjective reasons for dropout

	General findings	Implications for refugees and asylum seekers
Predictors		
Patient	Higher dropout rates in: • younger patients (not confirmed by Zimmermann et al., 2016) • less educated patients (unclear in Swift et al., 2012) • male patients (unclear in Swift et al., 2012) • patients with personality disorders or eating disorder Initial impairment Psychological mindedness, perception of mental health, treatment expectation No association: ethnicity; employment status	High percentage of sociodemographic characteristics that are known to be high risk for dropout (age, gender, education) High initial impairment due to pre-, peri-, post-migration stressors Cultural differences in perception, thoughts, beliefs about mental health and psychological treatment (culture specific assumptions; socialization)
Treatment	Higher dropout rates in • unfixed number of treatment session • low degree of manualization • university-based institutions Difference in treatment orientations for PTSD, depression, eating disorder (but see Imel et al., 2013) Treatment barriers No association: treatment format	High prevalence of PTSD and depression; therefore, influence of treatment orientation should be considered Various treatment barriers due to post-migration stressors, i.e., demanding living conditions, language barriers, communication difficulties, limited economic resources; lack of social contacts; rejected asylum applications
Therapist	Higher dropout rate: • therapist in training Strength of therapeutic alliance No association: therapists' age, gender, or race	Difficulties in building and maintaining therapeutic alliance due to lack in building trust towards health care professionals and authorities as well as unfamiliarity with the health care systems

Study and design	Higher dropout rate: • dropout definition based on therapist judgment • effectiveness studies	
Subjective Reasons reported by patients		
	Dissatisfaction with therapist or therapy Unresolvable ruptures in patient-therapist relationship External barriers (e.g. financial, logistical)	Culture-related deviations in treatment expectations might lead to dissatisfaction with therapist and therapy Vulnerable patient-therapist relationship due to lack in gaining trust Various external barriers due to post-migration stressors

Preventing dropout

The reduction of dropout is a major challenge in both clinical practice and clinical research provided to refugees and asylum seekers. Therefore, effective measures are needed to prevent dropout in clinical practice in order to provide the best possible care for all patients. In clinical research, such implementations can increase the quality and validity of research results and thus contribute to the improvement of therapeutic measures in the long term.

This appears particularly important for refugees and asylum seekers who represent a highly vulnerable group where high dropout rates are to be expected. Due to the lack of specific evidence in the treatment of refugees and asylum seekers it is essential to derive measures from the Western non-refugee population and adapt these strategies to the particular treatment challenges and needs of this people group. Further, specific strategies that only apply to refugees and asylum seekers are conceivable. For an overview of measures to prevent dropout, see Table 1.4.

Swift et al. (2012) suggested that therapists should inform their patients about the duration of therapy and typical patterns of change. Many patients have unrealistic expectations about the duration of therapy; they expect a quick recovery in a small number of therapy sessions (see Table 1.4). There is extensive evidence that the expected number of sessions is

considered the best predictor of the actual number of sessions attended (e.g. Mueller & Pekarik, 2000) and that this expectation also influences the dropout rate (e.g. Callahan et al., 2009). In their RCT with 63 participants, Swift and Callahan (2011) found that the implementation of an education program that informs patients about the anticipated duration of therapy and the positive relationship between the number of therapy sessions and the probability of recovery prolongs the absolute duration of treatment and reduces the dropout rate.

Especially in the treatment offered to refugees and asylum seekers treatment expectations might differ drastically (e.g., Priebe et al., 2016; Sandhu et al., 2013; van Loon et al., 2011). Presumably, preparatory sessions as evaluated in Swift and Callahan (2011) are effective measures to prevent dropout in refugees and asylum seekers.

Further, patients' role expectations must be clarified. Existing expectations as well as possible misconceptions must be addressed. This is of particular importance when treating refugees and asylum seekers. Swift et al. (2012) assumed that unmet role expectations can either result from naïve beliefs shaped, for example, by stereotypes, but they also occur when the patient has a precise idea that cannot be fulfilled by his therapist. In the refugee population these disparities stem from cultural differences in the perception of mental illness, psychological treatment, and therapists (Barrett et al., 2008). There is extensive evidence that these unmet role expectations can predict dropout (e.g. Callahan et al., 2009). To prevent possible premature discontinuation of therapy, it is therefore important to discuss the distribution of roles in the first therapy session. There are numerous studies with Western samples showing the effectiveness of different role induction strategies in psychological treatments, especially of so-called orientation videos (Barrett et al., 2008; Ogrodniczuk et al., 2005; Swift et al., 2012). For example, Reis and Brown (2006) showed in their interventions study with 125 patients that dropout could be significantly reduced by viewing a 12-minute role induction video. While the video format is often used to introduce the different roles, there is also evidence from older studies showing that this can also be done orally or in written format (Swift et al., 2012).

To explore culture-specific beliefs about mental illnesses and psychotherapeutic treatment, Liedl et al. (2016) recommended a detailed assessment of the patient's history, extended by culture- and refugee-specific aspects. An early clarification of barriers that could complicate the therapeutic process allows an adaption of the process before premature termination can even occur. Note however, that a detailed description of traumatic experiences is often not indicated at this point in treatment. For example, traumatic experiences should only be named but not described in detail. In the course of therapy, when a level of trust has been established, the trauma history can be discussed in-depth (Liedl et al., 2016). Here as well a culturally sensitive approach should be chosen. This takes the specific symptoms, their history and individual biography into account, breaks down cultural misunderstandings, and attempts to overcome language barriers (Abdallah-Steinkopff & Soyer, 2013; Kahraman & Abdallah-Steinkopff, 2010). However, the effects of a detailed anamnesis and a culturally sensitive approach on dropout rates have not been studied yet.

Besides exploring cultural specific expectations in a detailed anamnesis and adapting the role induction strategies to these specific expectations, it is important to develop and promote cultural competencies (Barrett et al., 2008; Liedl et al., 2016; Maramba & Nagayama Hall, 2002). Some authors suggest that building cultural competencies in treatment providers includes both, raising awareness and generating knowledge about cultural differences, and simultaneously acquiring skills to implement this knowledge in treatment and therefore appropriately respond to cultural differences. Therapists acquire suitable strategies for role inductions and learn to sensitively address and work with deviating expectations and goals. The acquisition of cultural skills thus leads to a responsive approach to the needs and expectations of the patients and strengthens the therapeutic alliance (Barrett et al., 2008; Liedl et al., 2016). Although this might consequently reduce the risk of premature discontinuation of therapy, studies investigating the effectiveness of cultural competencies on dropout are still missing (van Loon et al., 2011).

In addition, it is important to incorporate patients´ preferences before starting treatment including the type of treatment, but also preferences regarding to the therapist, therapeutic tools, behavior, and roles (Swift et al., 2012). According to the authors, patients often have concrete ideas, without having full insight into the possible treatment options. Therefore, therapists should share their knowledge of different therapeutic options with the patient, listen to the patient's preferences and make a joint decision on the best approach (Swift et al., 2012).

In the treatment offered to refugees and asylum seekers it is important to place a special focus on the exchange between patient and therapist, as knowledge on therapeutic options is often limited and treatment preferences might differ from Western samples. As evidence-based psychological interventions are available for refugees and asylum seekers (e.g., Kip et al., 2020), these should be offered with high priority, while at the same time taking patient preferences and specific circumstances into account. Meta-analytic findings including 18 studies showed that patients whose preferences were addressed, discontinued therapy less frequently than patients who had no choice or were provided with a treatment option they did not prefer (Swift et al., 2011) (see Table 1.4).

A handful of studies have shown that building and strengthening patients´ hope is a central factor for therapeutic success and thus, it is assumed to be effective in the reduction of dropout (Swift et al., 2012). Swift et al. (2012) recommended that it is important to ensure that a conviction that the therapy will contribute to the improvement of the problems is given, but at the same time, no unrealistic expectations are reinforced.

Refugees and asylum seekers often suffer from multiple problems related to the traumatic experiences in their home countries, their symptomatology, but also to the difficult living conditions and multiple post-migration stressors (e.g., Priebe et al., 2016). Often refugees express feeling like having lost all their hope (Liedl et al., 2016). Therefore, it is presumable that building and strengthening hope is a powerful measure to reduce the likelihood of premature termination of treatment in refugees and asylum seekers. Constantino et al. (2011)

described two strategies to build such a realistic hope. One is that the therapist describes a treatment rational that is comprehensible for the patient. On the other hand, the therapist expresses his personal confidence in the effectiveness of the therapy and in the patient's abilities. There is no evidence actual testing strategies focusing explicitly on patients' hope. Most of the authors rather focus on giving suggestions on this topic.

Fostering the therapeutic alliance is another effective measure to reduce the likelihood of dropout (see Table 1.4). Working with an understanding therapist where there is agreement on goals and tasks and where a strong sense of cohesion dominates, enhances the perceived benefits of therapy. Considering the extensive evidence on the influence of therapeutic alliance on treatment outcome, Swift et al. (2012) suggested that such a strong therapist-patient relationship reduces the probability of premature discontinuation of therapy. In their meta-analysis with 11 included studies, Sharf et al. (2010) were able to provide evidence supporting the assumption of an association between high dropout rates and low therapeutic alliance. It is conceivable that a strong therapeutic alliance has positive effects on treatment adherence in refugees and asylum seekers as well. Note that the lack in gaining trust towards health care authorities (Priebe et al., 2016; Sandhu et al., 2013) may result in some difficulties building this alliance. To effectively reduce dropout it is important to establish strategies to strengthen the alliance (Swift et al., 2012). The authors described different strategies that are being used in the two phases: To strengthen and later maintain the therapeutic alliance. While at the beginning of the therapy, an agreement on goals and tasks should be achieved, throughout therapy strategies for the development of a strong bond become increasingly important. Therapists should then take care to create a safe and empathic environment in which patients feel that they are working together on the same goal (Swift et al., 2012). There is a consensus in the current literature that it is particularly important to be aware of the fact that a break in the therapeutic relationship is often experienced as a severe loss, resulting in a higher risk for dropout (e.g. Barrett et al., 2008). Even though it is sometimes difficult to detect them, such ruptures should always be

taken into account. Several authors suggest that attention must be paid to the patient's negative feelings in order to work together to resolve the conflict and re-strengthen the relationship (Ogrodniczuk et al., 2005; Safran et al., 2011).

In the treatment of refugees and asylum seekers not only the therapist-patient relationship is important, but also the relationship between patient and interpreter, as well as between therapist and interpreter. Although a detailed consideration of treatment with interpreters would go beyond the scope of this article, it is important to state that working with interpreters can promote both, adherence and dropout. On the one hand, interpreters can be seen as a bridge between cultures. Supporting the therapist's cultural competencies, breaking down language barriers, and assisting with culturally sensitive aspects during treatment can facilitate to build trust and a therapeutic relationship and therefore strengthen treatment adherence (Liedl et al., 2016). On the other hand, working with interpreters can lead to difficulties, which may increase the risk of premature termination of therapy (Liedl et al., 2016). Conflicting political, ethical or religious affiliations, or in some cases a mismatch with regard to gender or the handling of taboo subjects, are seen as problematic (Liedl et al., 2016). It is important to address potentially difficult issues at an early stage, but also when they occur later in the course of therapy, in order to prevent possible ruptures in the therapeutic relationship. Special attention should be drawn to the interpreters' duty of confidentiality (Liedl et al., 2016). Since the exile community is mostly rather small, there is otherwise the danger that the patient will develop inhibitions to address critical issues. The effects of a mismatch between patients and interpreters are derived from clinical practices, again well-founded research is missing. Further, it is important considering the quality of the therapist-interpreter relationship. Raval (2003) and Hassan and Blackwood (2020) discussed difficulties of establishing a working alliance due to feelings of absence of support and recognition and denial of importance on the interpreter side and feelings of tension and simplification of the treatment measures on the therapists side. These difficulties are known to influence the triadic therapeutic alliance and therefore also the

probability of premature termination of treatment. To prevent dropout therapists should therefore focus on strengthening the co-working alliances (Raval, 2003).

In addition, there is evidence that assessing and discussing the treatment progress is indispensable to allow a patient-focused approach in the course of treatment (Swift et al., 2012). To realize a strategic monitoring, objective measures to track the outcome are used, the patient's progress in treatment is compared with typical patterns of improvement, and finally the therapist is given feedback on the relation of the present therapy progress to the desired progress (Howard et al., 1996). A deviating therapy progress is often accompanied by negative feelings (M. J. Lambert et al., 2001), the patient no longer perceives the benefits of the therapy (Swift et al., 2012), and dropout becomes more likely (M. J. Lambert, 2017).

Especially for refugees and asylum seekers, who often have difficulties in finding a therapy and need to overcome various treatment barriers (Slobodin & de Jong, 2015), it is important that the benefit of treatment is always perceivable and outweighs the existing barriers. Mütze et al. (2021) could show that the risk of treatment dropout could be predicted by routine outcome monitoring. If the therapist detects these changes at an early stage, adjustments can be made to the course of therapy before premature discontinuation can even occur (Swift et al., 2012). Although there is evidence supporting the use of feedback systems on treatment outcome (Brattland et al., 2018; M. J. Lambert et al., 2001, 2018), the effects on preventing patients' dropout remain unclear. Comparing dropout rates assessed in routine outcome monitoring studies showed an ambiguous picture. Delgadillo et al. (2018) reported in their large-scale RCT with 2233 patients that there were no significant differences in the dropout rates between the feedback intervention group (24.1%) and treatment-as-usual (23.9%). Same applied for the "not on track" subsample, with significantly worse symptoms.

Barrett et al. (2008) discussed another strategy to reduce dropout. As motivation can be seen as crucial for beginning and remaining in treatment, this factor is also important when talking of premature termination of therapy. A treatment approach aimed at increasing and

facilitating the internal motivation of patients to achieve changes is therefore recommended. Barrett et al. (2008) focused on motivational interviewing. By helping the patient to build up their own motivation of change, they are guided to resolve possible ambivalent feelings towards the therapy. Barret et al. (2008) suggested that an internally motivated change process can therefore increase commitment and reduce dropout rates. There is first evidence that motivational interviewing proves to be effective in reducing dropout rates (Carroll et al., 2001). However it should be noted that despite the positive effects, results on motivational interviewing are inconsistent (Barrett et al., 2008).

In refugees and asylum seekers these ambivalent feelings towards therapy can be caused by the feeling that daily concerns are not addressed sufficiently in treatment. Therefore, increasing and facilitating the internal motivation in refugees and asylum seekers to gain a comprehensive prevention of dropout always goes along with addressing the demanding living conditions (e.g., accommodation difficulties, lack of privacy) and the presence of multiple post-migration stressors (e.g., difficulties during the asylum procedure, language difficulties) (Liedl et al., 2016). Ogrodniczuk et al. (2005) discussed the use of case management as effective measure. In addition to the actual psychological treatment, so-called case managers can help the patient to cope with the daily stressful living conditions, the presence of which might otherwise have led to a premature termination of therapy. One study reported that case management in addition to CBT reduced the dropout rate by 50 % compared to CBT alone (Miranda et al., 2003). Furthermore, the therapeutic process itself should also focus on dealing with the difficult daily life and the existing post-migration stressors. Liedl et al. (2016) suggested that a resource-oriented approach as well as the increase of pleasant activities and the encouragement of social integration is indispensable, especially at the beginning of the therapy. Such a consideration of the living conditions can not only contribute to a stabilization of the patients, but can also create a feeling of being understood, which in turn strengthens the compliance (Liedl et al., 2016; Priebe et al., 2016).

Furthermore, it appears to be important to look at patient characteristics correlated with high dropout rates to derive adequate strategies to reduce dropout. Research on predictors of dropout has shown that dropout might occur more frequently among younger, less educated patients, who may have a higher risk of being in dire of financial straits. Barrett et al. (2008) suggested that sometimes these individuals are facing urgent crises that bring them to seek treatment. Once this crisis is solved, other upcoming needs might outweigh the need to attend treatment and dropout becomes more likely. Therapists should therefore build awareness on crises and social needs of their patients and provide specific support services when appropriate (Coulter & Ellins, 2006).

In refugees and asylum seekers, there is an increased percentage of these high-risk patient characteristics. Especially they are often facing severe crisis, e.g. due to difficulties in the asylum process (Liedl et al., 2016). Thus, the measures described for Western samples can potentially be used in refugees populations, too. Some authors further hypothesize that for this vulnerable group, strategies are needed helping patients to develop skills that are known to facilitate treatment adherence (e.g., Ogrodniczuk et al., 2005). These interventions include various aspects of preparation, as role induction by means of preparatory videos (Reis & Brown, 2006) and the development of social skills, e.g. communication strategies or reducing impulsiveness. According to numerous studies the offer of a so-called preparatory intervention are effective in reducing dropout (see Ogrodniczuk et al., 2005, for an overview). As no specific mechanisms of action can be retrieved, a link to reinforcement of problematic patient characteristics is more hypothetical.

Derived from the clinical practice, sending appointment reminders might be another strategy that can help in reducing premature termination of dropout. Ogrodniczuk et al. (2005) suggested that by occasionally sending quick reminders, the patients' responsibility in attending a scheduled session is addressed and therefore dropout may become less likely. Note that changing contact details and language difficulties might complicate the implementation of

appointment reminders in the treatment of refugees and asylum seekers. Nevertheless, this strategy might be especially important for this people group, as refugees and asylum seekers are not used to the western health care system. Therefore, although there is no well-funded research on the use of appointment reminders, this strategy is a low-cost mean that can be implemented easily.

Table 1.4

Key findings on preventing dropout

General strategies	Implications for refugees and asylum seekers
Prevent unrealistic treatment expectations. Inform patient about duration of treatment and typical patterns of change.	Often deviating treatment expectations that need to be addressed.
Clarify role expectations and misconceptions. Use role induction strategies and preparatory sessions.	Cultural differences in perception of mental health, treatment, and therapist; importance of role induction and preparation. Use detailed anamnesis to explore cultural specific perceptions and beliefs. Develop and promote cultural competencies: raising awareness, generating knowledge, and acquiring skills.
Incorporate the preferences of the patient and share knowledge of therapeutic options.	Knowledge on treatment option is often limited; focus on transfer of knowledge.
Build and strengthen hope.	Multiple pre-, peri-, post-migration stressors result in feeling of lost hope; building and strengthening hope is essential.
Foster the therapeutic alliance.	Fostering therapeutic alliance might be difficult due to lack in gaining trust; strong alliance important. Consider patient-interpreter relationship. Consider therapist-interpreter relationship.
Assess and discuss the treatment progress; prevent negative feelings and loss in benefit of treatment.	High costs of starting and attaining treatment (various treatment barriers); focus on benefit is essential.
Increase and facilitate the internal motivation.	Ambivalent feelings towards treatment due to daily concerns that are not addressed in treatment. Adapt treatment process to daily life and existing post-migration stressors, e.g. focus on resource-oriented approach, increase pleasant activities, and encourage social integration. Consider the additional use of case management.
Focus on difficult patient characteristics.	Increased percentage of high-risk patient characteristics requires special attention.
Send appointment reminders.	Consider difficulties due to changing contact details and language barriers.

Conclusion

This review provides for the first time practice-oriented knowledge on dropout in treatment offered to refugees and asylum seekers. As there is currently extremely limited empirical evidence on the prevalence, prediction, and prevention of dropout in this specific population we reviewed the literature on dropout from treatment in general, and specifically discuss implementations for refugees and asylum seekers.

In Western non-refugee samples prevalence rates of about 20% (with a substantial variability) are reported for dropout from psychological treatment. Due to the lack of evidence, the actual dropout rate in treatment offered to refugees and asylum seekers is largely unknown. Current state evidence can only be drawn from single treatment efficacy trials that have shown a considerable variability in reported dropout rates ranging from 0% to 64.7% (e.g., Hinton et al., 2004; W. Renner et al., 2011).

The dropout rates (higher rates) seem to be influenced by patient's age (younger patients) and disorder (personality or eating disorder), as well as initial impairment (high) and treatment expectancy (low). In refugees and asylum seekers there seems to be an increased percentage of these high-risk variables (e.g., high initial impairment due to pre-, peri-, and post-migration stressors). Further, treatment expectations often differ due to culture-related deviations in the perception of mental health and mental health treatment. Other potential variables are the number of treatment sessions (unfixed), the degree of manualization (lower), the institution providing the treatment (university-based institutions), as well as the therapists experience level (lower level of experience) and the operationalization method of dropout (therapist judgement). Subjective reasons for dropout stated by patients include insufficient motivation, dissatisfaction with the therapist or treatment, and external barriers. Refugees and asylum seekers are facing various specific barriers and challenges, such as ongoing post-migration stressors (e.g., accommodation situation, socio-economic condition, isolation, loneliness), language barriers, and cultural differences.

In the current literature, preventive measures are mostly derived from research on predictors or refer to recommendations from the clinical practice. There is hardly any empirical evidence testing the effects of these measures on the dropout rate. However, there is reliable evidence for a reduction of dropout through an appropriate preparation of the patient for psychological treatment. These preparatory interventions mainly focus on role induction, treatment expectations, and information on psychological treatments in general (duration, change processes). Especially in the treatment offered to refugees and asylum seekers, where cultural differences in the perception of mental health, treatment, and therapists are likely, it is important to focus on an extensive role induction and preparation. In addition, fostering the therapeutic alliance and building and strengthening hope seem effective measures for refugees and asylum seekers. Further specific strategies should focus on the development and promotion of cultural competencies and the adaptation of treatment to the specific needs of the patients (post-migration stressors, difficult living conditions).

Future research is needed to evaluate the prevalence and predictors of dropout in treatment offered to refugees and asylum seekers. Further, research should focus on develop preventive strategies and testing their efficacy. This serves to reduce the occurrence of dropout and its adverse events in a population that is a challenging situation with an urgent need of support and psychological treatment.

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References Publication I

Abdallah-Steinkopff, B., & Soyer, J. (2013). Traumatisierte Flüchtlinge. Kultursensible Psychotherapie im politischen Spannungsfeld [Traumatized refugees. Culturally sensitive psychotherapy in the political arena]. In J. Feldmann Robert E. & G. H. Seidler (Eds.), *Traum(a) Migration: Aktuelle Konzepte zur Therapie traumatisierter Flüchtlinge und Folteropfer* (1st ed., pp. 137–166). Psychosozial-Verlag. https://doi.org/10.30820/9783837966558-137

Alpak, G., Unal, A., Bulbul, F., Sagaltici, E., Bez, Y., Altindag, A., Dalkilic, A., & Savas, H. A. (2015). Post-traumatic stress disorder among Syrian refugees in Turkey: a cross-sectional study. *International Journal of Psychiatry in Clinical Practice*, *19*(1), 45–50. https://doi.org/10.3109/13651501.2014.961930

Baekeland, F., & Lundwall, L. (1975). Dropping out of treatment: A critical review. *Psychological Bulletin*, 82, 738–783. https://doi.org/10.1037/h0077132

Barrett, M. S., Chua, W.J., Crits-Christoph, P., Gibbons, M. B., Casiano, D., & Thompson, D. (2008). Early withdrawl from mental health treatment: Implications for psychotherapy practice. *Psychotherapy*, *45*(2), 247–267. https://doi.org/10.1037/0033-3204.45.2.247

Beckham, E. E. (1992). Predicting patient dropout in psychotherapy. *Psychotherapy: Theory, Research, Practice, Training*, 29(2), 177–182. https://doi.org/10.1037/0033-3204.29.2.177

Bjork, T., Bjorck, C., Clinton, D., Sohlberg, S., & Norring, C. (2009). What happened to the ones who dropped out? Outcome in eating disorder patients who complete or prematurely terminate treatment. *European Eating Disorders Review*, *17*(2), 109–119. https://doi.org/10.1002/erv.911

Blackmore, R., Boyle, J. A., Fazel, M., Ranasinha, S., Gray, K. M., Fitzgerald, G., Misso, M., & Gibson-Helm, M. (2020). The prevalence of mental illness in refugees and asylum seekers: A systematic review and meta-analysis. *PLOS Medicine*, *17*(9), e1003337. https://doi.org/10.1371/journal.pmed.1003337

Bogic, M., Ajdukovic, D., Bremner, S., Franciskovic, T., Galeazzi, G. M., Kucukalic, A., Lecic-Tosevski, D., Morina, N., Popovski, M., Schutzwohl, M., Wang, D., & Priebe, S. (2012). Factors associated with mental disorders in long-settled war refugees: refugees from the former Yugoslavia in Germany, Italy and the UK. *The British Journal of Psychiatry, 200*(3), 216–223. https://doi.org/10.1192/bjp.bp.110.084764

Böttche, M., Heeke, C., & Knaevelsrud, C. (2016). Sequenzielle Traumatisierungen, Traumafolgestörungen und psychotherapeutische Behandlungsansätze bei

kriegstraumatisierten erwachsenen Flüchtlingen in Deutschland. .[Sequential traumatizations, trauma sequelae and psychological treatment approaches for war-traumatized adult refugees in Germany] *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, *59*(5), 621–626.

Boyd-Franklin, N. (2013). *Black families in therapy: Understanding the African American experience*. Guilford Publications.

Brattland, H., Koksvik, J. M., Burkeland, O., Gråwe, R. W., Klöckner, C., Linaker, O. M., Ryum, T., Wampold, B., Lara-Cabrera, M. L., & Iversen, V. C. (2018). The effects of routine outcome monitoring (ROM) on therapy outcomes in the course of an implementation process: A randomized clinical trial. *Journal of Counseling Psychology*, *65*(5), 641–652. https://doi.org/10.1037/cou0000286

Cahill, J., Barkham, M., Hardy, G., Rees, A., Shapiro, D. A., Stiles, W. B., & Macaskill, N. (2003). Outcomes of patients completing and not completing cognitive therapy for depression. *British Journal of Clinical Psychology*, *42*(2), 133–143. https://doi.org/10.1348/014466503321903553

Callahan, J. L., Aubuchon-Endsley, N., Borja, S. E., & Swift, J. K. (2009). Pretreatment expectancies and premature termination in a training clinic environment. *Training and Education in Professional Psychology*, *3*(2), 111.

Carroll, K. M., Libby, B., Sheehan, J., & Hyland, N. (2001). Motivational interviewing to enhance treatment initiation in substance abusers: an effectiveness study. *The American Journal on Addictions*, *10*(4), 335–339. https://doi.org/10.1080/aja.10.4.335.339

Cinkaya, F. (2016). Die Vielfalt von Abbrüchen in der Psychotherapie. *Eine Metaanalyse.* [The Multiplicity of Dropouts in Psychotherapy: A Meta-Analysis]. Hamburg: *Kovac*.

Constantino, M. J., Glass, C. R., Arnkoff, D. B., Ametrano, R. M., & Smith, J. Z. (2011). Expectations. In J C Norcross (Ed.), *Psychotherapy relationships that work: Evidence-based responsiveness (2nd ed.,* pp. 354–376). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199737208.003.0018

Coulter, A., & Ellins, J. (2006). Patient-focused interventions: a review of the evidence. Quest for Quality and Improved Performance (QQUIP). The Health Foundation, London.

Crumlish, N., & O'Rourke, K. (2010). A systematic review of treatments for post-traumatic stress disorder among refugees and asylum-seekers. *The Journal of Nervous and Mental Disease*, *198*(4), 237–251. https://doi.org/10.1097/NMD.0b013e3181d61258

Ebner, G. (2001). Grundlagen transkultureller Begutachtung. [Basics of transcultural assessment] In T. Hegemann & R. Salman (Eds.), *Transkulturelle Psychiatrie* (pp. 232–

251). Köln: Psychiatrie Verlag.

Farber, B. A. (1983). Psychotherapists' perceptions of stressful patient behavior. *Professional Psychology: Research and Practice*, *14*(5), 697–705. https://doi.org/10.1037/0735-7028.14.5.697

Fazel, M., Wheeler, J., & Danesh, J. (2005). Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *Lancet*, *365*(9467), 1309–1314. https://doi.org/10.1016/S0140-6736(05)61027-6

Fernandez, E., Salem, D., Swift, J. K., & Ramtahal, N. (2015). Meta-analysis of dropout from cognitive behavioral therapy: Magnitude, timing, and moderators. *Journal of Consulting and Clinical Psychology*, *83*(6), 1108–1122. https://doi.org/10.1037/ccp0000044

Gammouh, O. S., Al-Smadi, A. M., Tawalbeh, L. I., & Khoury, L. S. (2015). Chronic diseases, lack of medications, and depression among Syrian refugees in Jordan, 2013-2014. *Preventing Chronic Disease*, *12*, E10. https://doi.org/10.5888/pcd12.140424

Garb, H. N. (2004). Clinical Judgment and Decision Making. *Annual Review of Clinical Psychology*, *1*(1), 67–89. https://doi.org/10.1146/annurev.clinpsy.1.102803.143810

Garfield, S. L. (1994). Research on client variables in psychotherapy. In A E Bergin & S L Garfield (Eds.), *Handbook of psychotherapy and behavior change* (4th ed., pp. 190–228). John Wiley & Sons.

Gunderson, J. G., Frank, A. F., Ronningstam, E. F., Wachter, S., Lynch, V. J., & Wolf, P. J. (1989). Early discontinuance of borderline patients from psychotherapy. *Journal of Nervous and Mental Disease*, *177*(1)*,* 38-42. https://doi.org/10.1097/00005053-198901000-00006

Hargreaves, S. (2002). A body of evidence: torture among asylum seekers to the West. *Lancet*, *359*(9308), 793–794. https://doi.org/10.1016/S0140-6736(02)07888-1

Hassan, H., & Blackwood, L. (2020). (Mis)recognition in the Therapeutic Alliance: The Experience of Mental Health Interpreters Working With Refugees in U.K. Clinical Settings. *Qualitative Health Research*, *31*(2), 399–410. https://doi.org/10.1177/1049732320966586

Hatchett, G. T., Han, K., & Cooker, P. G. (2002). Predicting premature termination from counseling using the Butcher Treatment Planning Inventory. *Assessment*, *9(2),* 156–163. https://doi.org/10.1177/10791102009002006

Hatchett, G. T., & Park, H. L. (2003). Comparison of Four Operational Definitions of Premature Termination. *Psychotherapy: Theory, Research, Practice, Training*, 40(3), 226–231. https://doi.org/10.1037/0033-3204.40.3.226

Hinton, D. E., Chhean, D., Pich, V., Safren, S. A., Hofmann, S. G., & Pollack, M. H. (2005). A randomized controlled trial of cognitive-behavior therapy for Cambodian refugees with treatment-resistant PTSD and panic attacks: a cross-over design. *Journal of Traumatic Stress*, *18*(6), 617–629. https://doi.org/10.1002/jts.20070

Hinton, D. E., Hofmann, S. G., Pollack, M. H., & Otto, M. W. (2009). Mechanisms of efficacy of CBT for Cambodian refugees with PTSD: improvement in emotion regulation and orthostatic blood pressure response. *CNS Neuroscience & Therapeutics*, *15*(3), 255–263. https://doi.org/10.1111/j.1755-5949.2009.00100.x

Hinton, D. E., Pham, T., Tran, M., Safren, S. A., Otto, M. W., & Pollack, M. H. (2004). CBT for Vietnamese refugees with treatment-resistant PTSD and panic attacks: a pilot study. *Journal of Traumatic Stress*, *17*(5), 429–433. https://doi.org/http://dx.doi.org/10.1023/B:JOTS.0000048956.03529.fa

Hollifield, M., Warner, T. D., Lian, N., Krakow, B., Jenkins, J. H., Kesler, J., Stevenson, J., & Westermeyer, J. (2002). Measuring trauma and health status in refugees: a critical review. *JAMA*, *288*(5), 611–621. https://doi.org/10.1001/jama.288.5.611

Horner, M. S., & Diamond, D. (1996). Object relations development and psychotherapy dropout in borderline outpatients. *Psychoanalytic Psychology*, *13(2),* 205–223. https://doi.org/10.1037/h0079648

Howard, K. I., Moras, K., Brill, P. L., Martinovich, Z., & Lutz, W. (1996). Evaluation of psychotherapy: Efficacy, effectiveness, and patient progress. *American Psychologist*, *51(10)*, 1059–1064. https://doi.org/10.1037/0003-066X.51.10.1059

Imel, Z. E., Laska, K., Jakupcak, M., & Simpson, T. L. (2013). Meta-Analysis of Dropout in Treatments for Posttraumatic Stress Disorder.Journal of Consulting and Clinical Psychology, *81*(3), 394–404. https://doi.org/10.1037/a0031474

Kahraman, B., & Abdallah-Steinkopff, B. (2010). Same same but different. *PiD - Psychotherapie im Dialog*, *11*(04), 306–312. https://doi.org/10.1055/s-0030-1265905

Kalt, A., Hossain, M., Kiss, L., & Zimmerman, C. (2013). Asylum seekers, violence and health: a systematic review of research in high-income host countries. *American Journal of Public Health*, *103*(3), e30-42. https://doi.org/10.2105/AJPH.2012.301136

Kazour, F., Zahreddine, N. R., Maragel, M. G., Almustafa, M. A., Soufia, M., Haddad, R., & Richa, S. (2017). Post-traumatic stress disorder in a sample of Syrian refugees in Lebanon. *Comprehensive Psychiatry*, *72*, 41–47. https://doi.org/10.1016/j.comppsych.2016.09.007

Kip, A., Priebe, S., Holling, H., & Morina, N. (2020). Psychological interventions for

posttraumatic stress disorder and depression in refugees: A meta-analysis of randomized controlled trials. *Clinical Psychology & Psychotherapy*. https://doi.org/10.1002/cpp.2446

Kizilhan, J. I. (2018). PTSD of rape after IS ("Islamic State") captivity. *Archives of Women's Mental Health*, *21*(5), 517–524. https://doi.org/10.1007/s00737-018-0824-3

Knox, S., Adrians, N., Everson, E., Hess, S., Hill, C., & Crook-Lyon, R. (2011). Clients' perspectives on therapy termination. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, *21*(2), 154–167. https://doi.org/10.1080/10503307.2010.534509

Kolb, D. L., Beutler, L. E., Davis, C. S., Crago, M., & Shanfield, S. B. (1985). Patient and therapy process variables relating to dropout and change in psychotherapy. *Psychotherapy: Theory, Research, Practice, Training*, *22(4),* 702–710. https://doi.org/10.1037/h0085556

Lambert, J. E., & Alhassoon, O. M. (2015). Trauma-focused therapy for refugees: meta-analytic findings. *Journal of Counseling Psychology*, *62*(1), 28–37. https://doi.org/10.1037/cou0000048

Lambert, M. J. (2007). Presidential address: What we have learned from a decade of research aimed at improving psychotherapy outcome in routine care. *Psychotherapy Research*, *17*(1), 1–14. https://doi.org/10.1080/10503300601032506

Lambert, M. J. (2017). Maximizing Psychotherapy Outcome beyond Evidence-Based Medicine. *Psychotherapy and Psychosomatics*, *86*(2), 80–89. https://doi.org/10.1159/000455170

Lambert, M. J., Hansen, N. B., & Finch, A. E. (2001). Patient-focused research: Using patient outcome data to enhance treatment effects. *Journal of Consulting and Clinical Psychology*, *69*(2)*,* 159–172. https://doi.org/10.1037/0022-006X.69.2.159

Lambert, M. J., Whipple, J. L., & Kleinstäuber, M. (2018). Collecting and delivering progress feedback: A meta-analysis of routine outcome monitoring. *Psychotherapy*, *55*(4), 520–537. https://doi.org/10.1037/pst0000167

Liedl, A., Böttche, M., Abdallah-Steinkopff, B., & Knaevelsrud, C. (2016). *Psychotherapie mit Flüchtlingen-neue Herausforderungen, spezifische Bedürfnisse: Das Praxisbuch für Psychotherapeuten und Ärzte*. *[Psychotherapy with refugees- new challenges, specific needs: The practice book for psychotherapists and doctors.]* Schattauer Verlag.

Maher, M. J., Huppert, J. D., Chen, H., Duan, N., Foa, E. B., Liebowitz, M. R., & Simpson, H. B. (2010). Moderators and predictors of response to cognitive-behavioral therapy augmentation of pharmacotherapy in obsessive-compulsive disorder. *Psychological*

Medicine, *40*(12), 2013–2023. https://doi.org/10.1017/S0033291710000620

Maramba, G. G., & Nagayama Hall, G. C. (2002). Meta-analyses of ethnic match as a predictor of dropout, utilization, and level of functioning. *Cultural Diversity and Ethnic Minority Psychology*, 8(3,) 290–297. https://doi.org/10.1037/1099-9809.8.3.290

McMurran, M., Huband, N., & Overton, E. (2010). Non-completion of personality disorder treatments: A systematic review of correlates, consequences, and interventions. *Clinical Psychology Review*, *30*, 277–287. https://doi.org/10.1016/j.cpr.2009.12.002

Miranda, J., Azocar, F., Organista, K. C., Dwyer, E., & Areane, P. (2003). Treatment of Depression Among Impoverished Primary Care Patients From Ethnic Minority Groups. *Psychiatric Services*, *54*(2), 219–225. https://doi.org/10.1176/appi.ps.54.2.219

Mueller, M., & Pekarik, G. (2000). Treatment duration prediction: Client accuracy and its relationship to dropout, outcome, and satisfaction. *Psychotherapy: Theory, Research, Practice, Training, 37(2)*, 117–123. https://doi.org/10.1037/h0087701

Mütze, K., Witthöft, M., Lutz, W., & Bräscher, A.-K. (2021). Matching research and practice: Prediction of individual patient progress and dropout risk for basic routine outcome monitoring. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, 1–14. https://doi.org/10.1080/10503307.2021.1930244

Nickerson, A., Bryant, R. A., Silove, D., & Steel, Z. (2011). A critical review of psychological treatments of posttraumatic stress disorder in refugees. *Clinical Psychology Review*, *31*(3), 399–417. https://doi.org/10.1016/j.cpr.2010.10.004

Nose, M., Ballette, F., Bighelli, I., Turrini, G., Purgato, M., Tol, W., Priebe, S., & Barbui, C. (2017). Psychosocial interventions for post-traumatic stress disorder in refugees and asylum seekers resettled in high-income countries: Systematic review and meta-analysis. *PLOS ONE*, *12*(2). https://doi.org/10.1371/journal.pone.0171030

O'Keeffe, S., Martin, P., Target, M., & Midgley, N. (2019). 'I Just Stopped Going': A Mixed Methods Investigation Into Types of Therapy Dropout in Adolescents With Depression. *Frontiers in Psychology, 10, 75.* https://www.frontiersin.org/article/10.3389/fpsyg.2019.00075

Ogrodniczuk, J. S., Joyce, A. S., & Piper, W. E. (2005). Strategies for Reducing Patient-Initiated Premature Termination of Psychotherapy. *Harvard Review of Psychiatry*, *13*(2), 57–70. https://doi.org/10.1080/10673220590956429

Palic, S., & Elklit, A. (2011). Psychosocial treatment of posttraumatic stress disorder in adult refugees: A systematic review of prospective treatment outcome studies and a critique. *Journal of Affective Disorders*, *131*, 8–23. https://doi.org/10.1016/j.jad.2010.07.005

Parsonage, M. (2003). *The economic and social costs of mental illness*. London: Sainsbury Centre for Mental Health.

Pekarik, G. (1992). Relationship of clients' reasons for dropping out of treatment to outcome and satisfaction. *Journal of Clinical Psychology*, *48*(1), 91–98. https://doi.org/dgmbgw

Piselli, A., Halgin, R., & MacEwan, G. (2011). What went wrong? Therapists' reflections on their role in premature termination. *Psychotherapy Research*, *21*(4), 400–415. http://10.0.4.56/10503307.2011.573819

Porter, M., & Haslam, N. (2005). Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: a meta-analysis. *JAMA*, *294*(5), 602–612. https://doi.org/10.1001/jama.294.5.602

Priebe, S., Giacco, D., & El-Nagib, R. (2016). *Public health aspects of mental health among migrants and refugees: a review of the evidence on mental health care for refugees, asylum seekers and irregular migrants in the WHO European Region*. World Health Organization. Regional Office for Europe.

Raval, H. (2003). Therapists' Experiences of Working with Language Interpreters. *International Journal of Mental Health*, *32*(2), 6–31. https://doi.org/10.1080/00207411.2003.11449582

Reis, B., & Brown, L. (2006). Preventing Therapy Dropout in the Real World: The Clinical Utility of Videotape Preparation and Client Estimate of Treatment Duration. *Professional Psychology: Research and Practice*, *37*, 311–316. https://doi.org/10.1037/0735-7028.37.3.311

Renner, A., Jäckle, D., Nagl, M., Plexnies, A., Röhr, S., Löbner, M., Grochtdreis, T., Dams, J., König, H.-H., Riedel-Heller, S., & Kersting, A. (2021). Traumatized Syrian Refugees with Ambiguous Loss: Predictors of Mental Distress. *International Journal of Environmental Research and Public Health*, *18*(8). https://doi.org/10.3390/ijerph18083865

Renner, W., Bänninger-Huber, E., & Peltzer, K. (2011). Culture-Sensitive and Resource Oriented Peer (CROP)-Groups as a community based intervention for trauma survivors: A randomized controlled pilot study with refugees and asylum seekers from Chechnya. *Australasian Journal of Disaster and Trauma Studies*, *2011*(1), 1–13.

Roos, J., & Werbart, A. (2013). Therapist and relationship factors influencing dropout from individual psychotherapy: a literature review. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, *23*(4), 394–418. https://doi.org/10.1080/10503307.2013.775528

Ryan, D., Dooley, B., & Benson, C. (2008). Theoretical Perspectives on Post-Migration Adaptation and Psychological Well-Being among Refugees: Towards a Resource-Based Model. *Journal of Refugee Studies*, *21*. https://doi.org/10.1093/jrs/fem047

Safran, J. D., Muran, J. C., & Eubanks-Carter, C. (2011). Repairing alliance ruptures. In J. C. Norcross (Ed.), *Psychotherapy relationships that work: Evidence-based responsiveness, (2nd ed.*, pp. 224–238). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199737208.003.0011

Sandhu, S., Bjerre, N. V, Dauvrin, M., Dias, S., Gaddini, A., Greacen, T., Ioannidis, E., Kluge, U., Jensen, N. K., Lamkaddem, M., Puigpinós i Riera, R., Kósa, Z., Wihlman, U., Stankunas, M., Straßmayr, C., Wahlbeck, K., Welbel, M., & Priebe, S. (2013). Experiences with treating immigrants: a qualitative study in mental health services across 16 European countries. *Social Psychiatry and Psychiatric Epidemiology*, *48*(1), 105–116. https://doi.org/10.1007/s00127-012-0528-3

Sharf, J., Primavera, L. H., & Diener, M. J. (2010). Dropout and therapeutic alliance: A meta-analysis of adult individual psychotherapy. *Psychotherapy: Theory, Research, Practice, Training*, *47(4)*, 637–645. https://doi.org/10.1037/a0021175

Slewa-Younan, S., Guajardo, M. G. U., Heriseanu, A., & Hasan, T. (2015). A systematic review of post-traumatic stress disorder and depression amongst Iraqi refugees located in western countries. *Journal of Immigrant and Minority Health*, *17*(4), 1231–1239.

Slobodin, O., & de Jong, J. T. V. M. (2015). Mental health interventions for traumatized asylum seekers and refugees: What do we know about their efficacy? *International Journal of Social Psychiatry*, *61*(1), 17–26. https://doi.org/10.1177/0020764014535752

Steel, Z., Chey, T., Silove, D., Marnane, C., Bryant, R. A., & van Ommeren, M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *JAMA*, *302*(5), 537–549. https://doi.org/10.1001/jama.2009.1132

Such, E., Walton, E., Bonvoisin, T., & Stoklosa, H. (2019). Modern slavery: a global public health concern. *BMJ, 364:* l838. https://doi.org/10.1136/bmj.l838

Swift, J. K., & Callahan, J. L. (2011). Decreasing treatment dropout by addressing expectations for treatment length. *Psychotherapy Research*, *21*(2), 193–200. https://doi.org/10.1080/10503307.2010.541294

Swift, J. K., Callahan, J. L., & Vollmer, B. M. (2011). Preferences. In J. C. Norcross *(Ed.).Psychotherapy relationships that work: Evidence-based responsiveness (2nd ed.*,

pp. 301–315). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199737208.003.0015

Swift, J. K., Callahan, J., & Levine, J. C. (2009). Using clinically significant change to identify premature termination. *Psychotherapy*, *46*(3), 328–335. https://doi.org/10.1037/a0017003

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *Journal of Consulting and Clinical Psychology*, *80*(4), 547–559. https://doi.org/10.1037/a0028226

Swift, J. K., & Greenberg, R. P. (2014). A treatment by disorder meta-analysis of dropout from psychotherapy. *Journal of Psychotherapy Integration*, *24*(3), 193. https://doi.org/10.1037/a0037512

Swift, J. K., Greenberg, R. P., Tompkins, K. A., & Parkin, S. R. (2017). Treatment refusal and premature termination in psychotherapy, pharmacotherapy, and their combination: A meta-analysis of head-to-head comparisons. *Psychotherapy*, *54*(1), 47–57. https://doi.org/10.1037/pst0000104

Swift, J. K., Greenberg, R., Whipple, J., & Kominiak, N. (2012). Practice Recommendations for Reducing Premature Termination in Therapy. *Professional Psychology: Research and Practice*, *43*, 379–387. https://doi.org/10.1037/a0028291

Tekin, A., Karadağ, H., Süleymanoğlu, M., Tekin, M., Kayran, Y., Alpak, G., & Şar, V. (2016). Prevalence and gender differences in symptomatology of posttraumatic stress disorder and depression among Iraqi Yazidis displaced into Turkey. *European Journal of Psychotraumatology*, *7*, 28556. https://doi.org/10.3402/ejpt.v7.28556

Thompson, C. T., Vidgen, A., & Roberts, N. P. (2018). Psychological interventions for post-traumatic stress disorder in refugees and asylum seekers: A systematic review and meta-analysis. *Clinical Psychology Review*, *63*, 66–79. https://doi.org/10.1016/j.cpr.2018.06.006

Tribe, R. H., Sendt, K.-V., & Tracy, D. K. (2019). A systematic review of psychosocial interventions for adult refugees and asylum seekers. *Journal of Mental Health*, *28*(6), 662–676. https://doi.org/10.1080/09638237.2017.1322182

Turrini, G., Purgato, M., Acarturk, C., Anttila, M., Au, T., Ballette, F., Bird, M., Carswell, K., Churchill, R., Cuijpers, P., Hall, J., Hansen, L. J., Kösters, M., Lantta, T., Nosè, M., Ostuzzi, G., Sijbrandij, M., Tedeschi, F., Valimaki, M., … Barbui, C. (2019). Efficacy and acceptability of psychosocial interventions in asylum seekers and refugees: Systematic review and meta-analysis. *Epidemiology and Psychiatric Sciences*, *28*(4),

376–388. https://doi.org/10.1017/S2045796019000027

Turrini, G., Purgato, M., Ballette, F., Nose, M., Ostuzzi, G., & Barbui, C. (2017). Common mental disorders in asylum seekers and refugees: umbrella review of prevalence and intervention studies. *International Journal of Mental Health Systems*, *11*, 51. https://doi.org/10.1186/s13033-017-0156-0

United Nation High Commissioner for Refugees, UNHCR (2020). *Global Trends. Forced Displacement in 2019*. https://www.unhcr.org/5ee200e37.pdf

Van Loon, A., van Schaik, D. J. F., Dekker, J. J., & Beekman, A. T. F. (2011). Effectiveness of an intercultural module added to the treatment guidelines for Moroccan and Turkish patients with depressive and anxiety disorders. *BMC Psychiatry*, *11*, 13. https://doi.org/cv8ffz

Westmacott, R., Hunsley, J., Best, M., Rumstein-McKean, O., & Schindler, D. (2010). Client and therapist views of contextual factors related to termination from psychotherapy: A comparison between unilateral and mutual terminators. *Psychotherapy Research*, *20*(4), 423–435. http://10.0.4.56/10503301003645796

Wierzbicki, M., & Pekarik, G. (1993). A meta-analysis of psychotherapy dropout. In *Professional Psychology: Research and Practice*, 24(2), 190–195. https://doi.org/10.1037/0735-7028.24.2.190

Winkler, R. (2018). *Dropout in Psychotherapien [Dropout in psychotherapy]. LBI-HTA Projektbericht Nr.:100.*; Ludwig Blotzmann Institut für Health Technology Assessment.

Zimmermann, D., Rubel, J., Page, A. C., & Lutz, W. (2017). Therapist effects on and predictors of non-consensual dropout in psychotherapy. *Clinical Psychology & Psychotherapy*, *24*(2), 312–321. https://doi.org/10.1002/cpp.2022

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Dropout from psychological interventions for refugees and asylum seekers: a meta-analysis

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Abstract

Background: Refugees and asylum seekers often suffer from migration stressors and related psychopathology. However, providing this population with psychological treatment has a number of barriers (e.g., culture and language differences), which are widely thought to hinder the success and continuation of treatment. ***Objective:*** The current systematic review and meta-analysis aims to provide first comprehensive evidence on the prevalence and predictors of dropout in treatment provided for refugees and asylum seekers. ***Method:*** We synthesized the existing evidence on dropout from psychological and psychosocial interventions provided to adult refugees and asylum seekers resettled in high-income countries. Specifically, we meta-analyzed the prevalence of dropout from treatment, and explored the factors that predict dropout. Our database search in PubMed, PsycInfo, Web of Science and PTSDpubs identified 28 eligible randomized controlled trials (2,691 participants; 39 active treatment conditions), published up to January 31, 2021. ***Results:*** Results showed a weighted average dropout rate of 19.14%, 95% CI [14.66, 24.60] across studies and treatment conditions. Subgroup analyses and meta-regressions revealed no statistically significant predictors for dropout. However, several refugee-specific variables (e.g., longer mean duration in country of resettlement, lower rate of insecure asylum status) may merit closer attention in future research. ***Conclusions:*** These findings suggest that, in contrast to widespread assumption, the estimated average dropout rate is comparable to those reported in non-refugee populations. However, more research is needed to establish the underlying mechanisms of dropout, which may differ across populations.

Keywords: Dropout, prevalence, predictors, refugees, asylum seeker, meta-analysis

Public Health Significance Statement

This study suggests that about 20% of refugees and asylum seekers prematurely terminate psychological or psychosocial treatment. Contrary to the wide-spread assumption about the difficulty retaining refugees in psychological treatment, this rate is comparable to dropout rates found in non-refugee populations. Although the variables that influence the dropout rate remain unclear, our analyses point to the importance of refugee-specific variables (e.g., asylum status) while identifying no influence of the other sociodemographic variables (e.g., diagnosis, age) on dropout.

Dropout from psychological interventions for refugees and asylum seekers: a meta-analysis

Currently, 79.5 million people worldwide are forcibly displaced due to war, conflicts, persecution or human rights violations (United Nation High Commissioner for Refugees, 2020). Refugees and asylum seekers are exposed to numerous burdensome experiences and stressors while living in their home country (Bogic et al., 2012; Hargreaves, 2002; Kalt et al., 2013; Priebe et al., 2016), as well as during the displacement (Böttche et al., 2016; Priebe et al., 2016; Ryan et al., 2008) and resettlement process (Böttche et al., 2016; Liedl et al., 2016; Porter & Haslam, 2005). The burden of these pre-, peri- and post-migration stressors is known to affect the physical and mental health of refugees and asylum seekers (Nickerson et al., 2011). A large-scale meta-analysis on refugees across different home and resettlement countries (Silove et al., 2009) reported prevalence rates of 30.6% for posttraumatic stress disorder (PTSD) and 30.8% for depression with a considerable variance of prevalence rates among studies (PTSD: 0% – 99%; Depression: 3% – 85.5%). In a large-scale umbrella review focusing on refugees resettled in high-income countries, Turrini et al. (2017) reported prevalence rates ranging from 3% to 50 % for PTSD, from 3% to 100 % for depression and from 12% to 77 % for anxiety disorders. These figures indicate the need for effective treatment services targeting mental health problems in refugees and asylum seekers. As of present, numerous psychological interventions for refugees and asylum seekers have been developed. The current evidence shows promising but not entirely consistent results on the effectiveness of these interventions (Crumlish & O'Rourke, 2010; Nose et al., 2017; Thompson et al., 2018; Turrini et al., 2019). The most recent meta-analysis reported an aggregated effect size of g = 0.77 for PTSD and g = 0.82 for depression, although there was considerable heterogeneity in the included studies (Kip et al., 2020).

Although effective treatments for refugees and asylum seekers are now available, there are still a number of barriers that hinder the initial start and continuation of treatment. For instance, some authors highlighted the language differences, unstable residence status, and the frequency of changed contact addresses as crucial factors that affect the initiation and might increase the likelihood of dropout (Bhatia & Wallace, 2007; van Loon et al., 2011); other authors spotted ongoing post-migration stressors, such as challenging accommodation situations, poor socio-economic conditions, loneliness, isolation, and feelings of helplessness (Böttche et al., 2016; Liedl et al., 2016; Porter & Haslam, 2005; Priebe et al., 2016). Preliminary findings also suggested that there are prominent cultural differences in the perceptions and assumptions of mental illness, psychological treatment, and therapists (Barrett et al., 2008; Liedl et al., 2016) as well as the expectation for treatment (e.g., Slobodin & de Jong, 2015; van Loon et al., 2011). As any of these factors are likely to impact on access and retention of treatment, dropout from treatment in this population is expected to be more prevalent than in non-refugee patients (Barrett et al., 2008; Priebe et al., 2016; Slobodin & de Jong, 2015; van Loon et al., 2011). Yet, the likelihood of dropout occurrence across various trial settings and diverse refugee populations is still unclear. Furthermore, it is of theoretical and practical importance to identify the factors that best inform dropout among the refugee-specific barriers that researchers have documented in the literature. Therefore, the current meta-analysis aimed to provide comprehensive evidence on the prevalence and predictors of dropout in treatment provided for refugees and asylum seekers.

Definition of Dropout

One of the most widely used definitions of dropout is a termination of an initiated treatment before the symptoms that had caused the patient to seek treatment have been alleviated (Garfield, 1986; Hatchett & Park, 2003; Swift et al., 2009; Swift & Greenberg, 2012). However, in the literature, a number of variants can be found and no consensus has been reached on the operationalization of dropout despite repeated calls for developing common standard

(e.g., Barrett et al., 2008; Fernandez et al., 2015; Imel et al., 2013; Swift & Greenberg, 2012). For example, some studies define dropout as: (a) Failure to complete an a priori defined number of therapy sessions that is considered to be the minimum dose for symptom improvement; (b) failure to attend the complete treatment protocol; (c) missing a scheduled treatment session without rescheduling it or attending any further sessions; (d) therapist's judgement; (e) clinical significance of change during treatment; termination of treatment without measurable improvement and without achieving normal range scoring in the outcome assessment (Hatchett & Park, 2003; Lambert, 2007; Swift et al., 2009; Swift & Greenberg, 2012). The use of different definitions of dropout may have caused the inconsistency in reported dropout rates in the literature (Hatchett & Park, 2003; Swift & Greenberg, 2012; Wierzbicki & Pekarik, 1993). Therefore, we reviewed how dropout was defined in individual studies and examined how the variants of definitions influence the reported dropout rates.

Prevalence and Predictors of Dropout

A handful of meta-analyses have reported the prevalence of dropout from psychological treatment and its possible predictors in general (non-refugee) patient populations. One of the earliest comprehensive reviews (Wierzbicki & Pekarik, 1993) estimated the average dropout rate as 46.9%, 95% CI [42.9, 50.8], which was replicated by follow-up studies in the 1990s (e.g., Garfield, 1994). However, a more recent large-scale meta-analysis (Swift & Greenberg, 2012) on 669 studies covering 83,834 adult patients suggests that dropout may be considerably lower than the earlier estimation by Wierzbicki and Pekarik (1993). Results showed a weighted mean dropout rate of 19.7%, 95% CI [18.7, 20.7] with the range of 0% – 74.2%, indicating a high degree of heterogeneity among the analyzed studies. Dropout rates from recent reviews with focus on specific treatment orientations or disorders, fall in a similar range. For Cognitive Behavioral Therapy (CBT) an estimated dropout rate of 26.2% was reported (Fernandez et al., 2015). Lewis et al. (2020) reported a dropout rate of 16.0% from treatments for PTSD in adults;

the estimated dropout rate from guideline-recommended treatment for PTSD was 20.9% (Varker et al., 2021).

In addition to studying the prevalence of dropout from psychological treatment, a growing body of research has focused on predictors for dropout. Although a number of candidate predictors have been proposed, only few have been demonstrated to be significant across different studies. Swift and Greenberg (2012) found higher dropout rates in younger patients as well as those with personality or eating disorders. The researchers also identified higher dropout rates for treatments that were provided: with unfixed (vs. fixed) number of sessions, with lower degrees of manualization, and in university-based institutions (vs. routine clinical settings). In addition, higher dropout rates were also found when therapists had lower levels of experience, and when therapists used their own judgement to define each dropout case (not relying on a standardized definition). On the other hand, neither patients' ethnicity nor their employment status was predictive of dropout (Swift & Greenberg, 2012). Other reviews are in line with Swift and Greenberg's (2012) results, and more recent studies and reviews successfully replicated their findings, i.e., higher dropout rates for younger patients (Barrett et al., 2008; Winkler, 2018; however, see Zimmermann et al., 2017; Varker et al., 2021), patients with personality disorder (Cinkaya, 2016; McMurran et al., 2010; Zimmermann et al., 2017), therapists with lower levels of experience (Roos & Werbart, 2013), and studies relying on the therapist-defined dropout (Hatchett & Park, 2003; Wierzbicki & Pekarik, 1993). Some authors have also identified new predictors such as high initial impairment and low treatment outcome expectancy (Barrett et al., 2008; Zimmermann et al., 2017) as well as patients' gender (more dropout in male patients) and level of education (higher dropout in less educated patients; Zimmermann et al., 2017).

The existent dropout studies have almost exclusively focused on Western or non-refugee patients, which means that the actual dropout rate and its predictors are largely unknown in the context of treatment offered to refugees and asylum seekers (Semmlinger & Ehring, 2020).

Therefore, we based our meta-analyses on the approach of Swift and Greenberg (2012) covering the study, sample, treatment and therapist characteristics as potential predictors of dropout (e.g., age and type of disorders), which might serve as a common mechanism of dropout both in refugee and non-refugee populations. In addition, we explored some population-specific predictors such as the asylum status, number of months in the host country, and cultural adaptation settings. These variables were derived from the literature and theories pointing to the key issues in the retention of treatment for refugees: e.g., culturally specific perceptions and expectations (e.g., Barrett et al., 2008; Liedl et al., 2016; Priebe et al., 2016; Sandhu et al., 2013; van Loon et al., 2011), ongoing stressors within the resettlement process (Liedl et al., 2016; Sandhu et al., 2013; Slobodin & de Jong, 2015), and trust building issues towards authority, and consequently also therapists (Liedl et al., 2016; Priebe et al., 2016).

Objective

We conducted a systematic review and meta-analysis in order to identify the prevalence and predictors of dropout (O = Outcome according to PRISMA guidelines, Moher et al., 2009) in psychological and psychosocial interventions (I = Intervention) for adult refugees and asylum seekers resettled in high income countries (P = Population). Only randomized controlled trials (RCTs) were included, with no restrictions regarding the control conditions (C = Comparison).

Method

The protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) with the registration number: CRD42020179964. The reporting of the meta-analysis follows the standard provided in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline (Moher et al., 2009).

Identification and selection of studies

Eligibility criteria

Inclusion criteria for the current meta-analysis were as follows: (1) study participants were refugees or asylum seekers resettled in high-income country; (2) study participants were adults (mean aged ≥ 18 years); (3) treatment under investigation was a psychological or psychosocial intervention; i.e., any non-pharmacological intervention aimed to improve clinical symptoms, behavior or general functioning (Nose et al., 2017; Tol et al., 2015)[3]; (4) treatment under investigation comprised at least two planned session or contacts; (5) the study design was an RCT; (6) the study was published in a peer-reviewed journal; (7) dropout rate is reported in the article.

We restricted the study design to RCTs to reduce the potential heterogeneity and risk of bias among included studies (Higgins et al., 2021): Another advantage of this approach was that almost all RCTs use appropriate control conditions, which allowed us to compare dropout rates in active treatment conditions to those in control conditions. Furthermore, we exclusively targeted studies on refugees resettled in high-income countries because this restriction reduces the heterogeneity among included studies and also increases comparability. In addition, targeting refugees in high-income countries allowed for valid comparisons of our own findings to the recently reported dropout rates for patients in high-income countries (Swift & Greenberg, 2012). No restrictions were made regarding the intervention format, publication date or language.

Search strategy

The literature search was conducted in the following electronic databases: PubMed, PsycInfo, Web of Science and PTSDpubs. Our search strategy can be summarized as follows:

[3] Examples for interventions falling within this definition are: cognitive and behavior therapies; counseling; behavior management; internet-based treatment. On the other hand, we did not regard as psychological or psychosocial interventions: medical treatment; medical education (e.g., for AIDS); prevention counseling (e.g., for cancer, parasite infections, tuberculosis); pharmacological intervention; nutritional counseling.

We searched the databases using two different search strings. In the first search, we included terms indicative for psychological and psychosocial intervention *(e.g., intervention; treatment),* refugee/asylum seeker *(e.g., refugee*; "asylum seeker*"; "displaced person")* and RCT *(e.g., "randomized controlled trial"; "randomized").* In a second search, the terms indicative for psychological and psychosocial intervention and refugee/asylum seeker were then combined with the terms indicative for dropout *(i.e., attrition; dropout; noncompletion).* To maximize the number of results, the terms indicative for RCTs were not included in the second search string. Both searches were conducted in title, abstract, keyword, and subject headings retrieved from the specific thesaurus of the particular database. The terms were combined using Boolean operators. In addition, term truncation (*) and quotes were used (see Appendix A2. for a detailed description of the search strategy). To retrieve additional publications, reference lists of previously published meta-analysis and systematic reviews on similar topics were reviewed. The meta-analysis and systematic reviews were retrieved through an additional search in the described databases. We searched in reference lists of identified studies. Gray literature including dissertations and theses, reports, clinical guidelines, books, evaluations published on websites, and conference contributions were examined to find additional peer-reviewed articles.

The first search was completed on May 1, 2020. The search was then updated before finalizing statistical analyzes to identify recently published studies. The current meta-analysis, therefore, includes all studies published up to January 31, 2021.

Screening

First, title and abstract of all studies were screened and studies clearly not fulfilling inclusion criteria were excluded at this stage. In the next step, all remaining articles were examined on a full text level. A second independent reviewer (HS) then reviewed the selected studies and verified the decisions that the first reviewer (VS) had made. Any discrepancy was resolved through close discussion between the first and second reviewer.

Data extraction

Two of the authors (VS and HS) independently conducted the data extraction, using the pre-determined extraction manual and extraction form designed for the current meta-analysis. If necessary, the authors of each eligible study were contacted for any unreported data that were needed for our planned analyses. The mean agreement rate across all variables was 94.3% (SD = 6.5%) and ranged between 78.6% and 100%. Any discrepancy was discussed together with the third member of the team (TE) until a consensus could be reached.

Following Swift and Greenberg (2012), we coded the dropout rate as well as categorial and continuous variables on the following four domains: study characteristics, sample characteristics, treatment-related variables, and therapist characteristics for each treatment condition (see Table 2.1). If necessary, the coding criteria were adapted to our specific context, i.e., refugees and asylum seekers.

Table 2.1

Variables included in the Moderator Analyses

	Domain of variable			
Type of variable	Study	Sample	Treatment	Therapist
Categorial	Country of study Study type Operationalization of dropout	Main diagnosis Country of Origin	Orientation Main Target Format Manualization Medication Cultural Adaption Setting	Experience level Interpreter
Continuous	Year of publication Sample Size	Age Gender Marital status Employment Education Asylum status Months in host country	Number of sessions Duration of sessions	

Note. Gender and asylum status were treated as a proportion (e.g., % of women) in a treatment group.

Dropout

To calculate the dropout rate, we extracted (a) the number of patients who started a psychological/psychosocial intervention but terminated prematurely (as a numerator); and (b) the number of participants who were randomized/allocated to that treatment condition (as a denominator). The dropout rate was also coded for any active comparators (e.g., treatment as usual) and other types of control conditions (e.g., wait list).

Study characteristics

The following study characteristics were coded: Year of publication, country in which the study was conducted (study origin country), study type (efficacy/effectiveness), sample size (N), as well as operationalization of dropout. The latter was coded according to Swift and Greenberg (2012) and Semmlinger and Ehring (2020) and included the following categories: dropout based on duration (less than a given number of sessions); dropout defined as non-completion of treatment protocol; dropout defined as missed appointments without rescheduling or coming to further sessions; dropout based on therapist judgment; dropout based on clinical significance (Hatchett & Park, 2003).

Sample characteristics

Furthermore, the variables related to the sample characteristics were coded on study level: i.e., age (average), gender (percent female), marital status (percent married or in committed relationships), employment status (percent in full-time or part time employment), education (percent with college-level education), asylum status (percent with insecure status – applied for asylum and awaiting decision on application for refugee status (United Nation High Commissioner for Refugees, 2011), months since arrival in host country (average), most frequent main diagnosis per sample[4] (PTSD/depression/anxiety/no clinical diagnosis), and main country of origin. Countries or regions of origin were grouped according to the specifications of the United Nation Statistics Division: Sub-Saharan Africa, Northern Africa

[4] We coded the most frequent main diagnosis per study. Comorbid disorders were not coded.

and Western Asia, Central and Southern Asia, Eastern and South-Eastern Asia, Latin America and the Caribbean, Australia and New Zealand, Oceania, Europe and Northern America (United Nations, 2020).

Treatment-related variables

The following treatment-related variables were coded: treatment orientation of the manual (CBT/Eye Movement Desensitization and Reprocessing [EMDR]/Narrative Exposure Therapy [NET]/other), main treatment target (trauma-focused/depression/anxiety/other), treatment format (individual/group/combination), number of sessions (number; per treatment condition), duration of each session (in minutes; per treatment condition), manualization (yes/no), concurrent medication allowed (yes/no), cultural adaption of the manual (yes/no) as well as treatment setting (% of patients in outpatient treatment/inpatient treatment/university-affiliated institution [inpatient or outpatient]/psychosocial care institution/refugee health care institution [e.g. refugee accommodation]/online intervention/other).

Therapist characteristics

We coded the therapists' age (average), gender (percent female), race, therapists' level of experience per treatment condition (trainee/experienced/mixed/no therapists) as well as whether the use an interpreter was permitted (yes/no, per treatment condition).

Quality Assessment

We used the revised Cochrane Risk of bias assessment tool (RoB 2.0 tool) to assess the risk of bias for all included studies (Sterne et al., 2019). In the present meta-analysis, the risk of bias assessment serves to indicate the study quality and thus potential threats to the internal validity of the findings, e.g. regarding OR of dropout between conditions. The assessment of bias was achieved by rating each included study on the associated signaling questions within following domains: randomization process, deviation from intended intervention, missing outcome data, measurement of the outcome, selection of the reported results, using the ratings *yes, probably yes, probably no, no.* Following an algorithm (Higgins et al., 2019), the risk of

the bias for each category could be evaluated as *low, some concerns* or *high*. As the assessment of possible researcher allegiance is not part of the Cochrane tool, the existence of this bias was assessed separately and reported where applicable.

Additionally, the quality of assessing, reporting and handling dropout was rated for each study using a pre-determined manual designed for the current meta-analyses. The manual consisted of signaling questions on four domains: the precision of the definition of dropout, the operationalization method used, the quality of reporting dropout as well as any analyses used to handle dropout. Each question was rated as *yes, no information, no;* resulting in an evaluation of each domain as *low quality, satisfactory, high quality*. Moreover, the overall quality was rated using the same classification (for details see Appendix A7.).

The risk of bias assessment was conducted by the same independent reviewers (VS; HS) who conducted the data extraction. Any discrepancy was discussed together with a third member of the team (TE) until a consensus was reached.

Statistical analysis

Effect sizes

Our primary outcomes were the dropout rate and the *OR*. The dropout rate was defined as the proportion of the patients who dropped out to the total number of patients who started treatment. Some studies had one or two treatment conditions in addition to the main treatment condition. In this case, the dropout rate was computed separately for the different conditions. The *OR* was given as the relative dropout rate of a treatment condition to a control condition. If a study had multiple active treatment conditions, *OR*s were calculated for each treatment condition compared to a respective control condition. The *OR* was not calculated for studies that only had an active treatment condition as the comparator (but not a no-intervention or wait-list control). These studies were therefore excluded from the *OR* analysis.

Multilevel Models

We calculated the weighted average dropout rate across all eligible studies and treatment conditions. Due to the variability among included studies, which may be caused by the diverse characteristics of the inclusion criteria, we assumed that the true effect size varies across studies. Therefore, we used a multilevel model to estimate the average dropout rate and *OR* (in a form of log-transformed proportion or ratio).

Furthermore, as our data had an extra nested structure (i.e., active treatment conditions nested within a study), we used three-level multilevel models. We confirmed that the three-level formulation fit the data better than the two-level model (without the in-between "study" level); The Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) were lower for the three-level than the two-level model: for the dropout rate, AIC = 101.95 vs. 110.19; BIC = 106.86 vs. 113.46. All multilevel models (including subgroup analyses and meta-regressions) were estimated using the R *metafor* package (Viechtbauer, 2010) with the restricted maximum likelihood (REML) estimation.

Test for Homogeneity

To examine the heterogeneity in the dropout rate and *OR*, we used Cochran's *Q* and I^2 (Higgins et al., 2003) statistics. The I^2 statistic was interpreted by using the guide provided by Higgins et al. (2021). According to the authors, an I^2 in the range of 0% – 40% *is potentially not important,* an I^2 in the range of 30 – 60% is rated as *moderate*, in the range of 50 – 90 % as *substantial*, and as *considerable* when reaching 75 – 100%. Note that Higgins et al. (2021) proposed these overlapping ranges as a rough guide for interpretation. In our meta-analysis, we used labels indicating the overlap when applicable (i.e., < 75% = substantial; 75% - 90 % = substantial to considerable; > 90% = considerable).

Subgroup and Meta-regression Analyses

Subsequent to the primary analyses, we performed subgroup and meta-regression analyses in the framework of the three-level multilevel model (i.e., active treatment conditions

nested within a study) using restricted maximum likelihood (REML) estimation. These analyses targeted the dropout rate only (but not *OR*s), as we were specifically interested in the moderators that are predictive of dropout in treatment conditions. Also, a smaller number of studies were available for *OR* as some studies had non-active treatment controls.

The subgroup analyses were performed on the following 14 categorial variables as potential moderators (Table 2.1). Because of the high heterogeneity of the eligible studies and the considerable amount of missing data in the variables of interest, we calculated the subgroup analyses separately for each moderator. *Q*-statistics were inspected as an omnibus test that informs whether each group variable is a significant predictor of dropout.

Similarly, meta-regression analyses were conducted separately for the following 11 continuous measures (Table 2.1). Given the number of tests that we performed for the subgroup (14) and meta-regression (11) analyses, we corrected the α-level using Benjamini-Hochberg approach (Benjamini & Hochberg, 1995).

Results

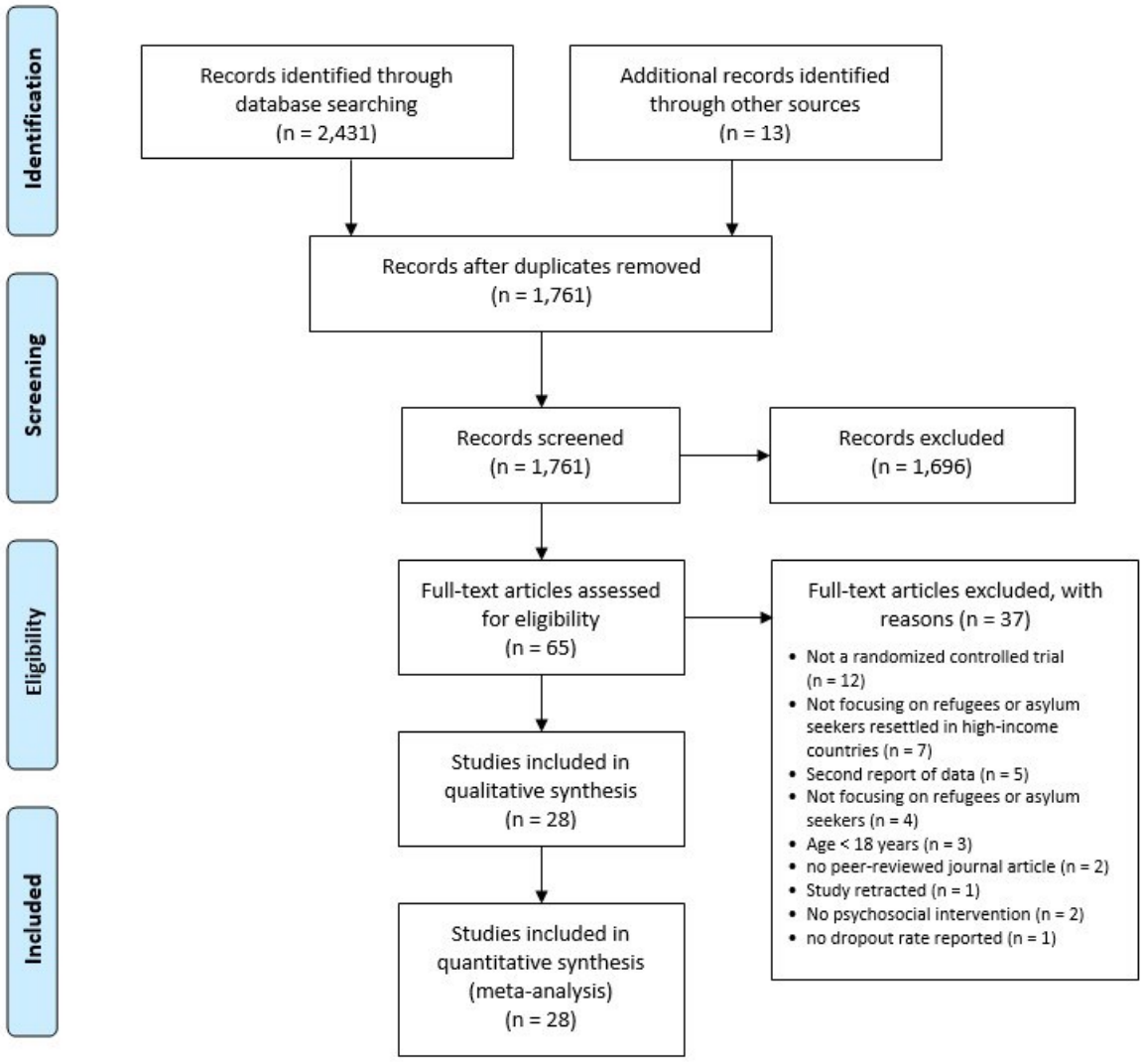
Study Characteristics

A total of 28 studies (k_s) (including 2,691 participants) were included in the meta-analysis, reporting the results of 39 active treatment conditions (k_t). See Figure 2.1 for a PRISMA flow diagram of the study selection process (see Appendix A3. for a list of excluded studies). One quarter of the studies were from Germany ($k_s = 7$) and USA ($k_s = 7$). A completion-based definition of dropout (failure to comply the treatment protocol) was the most frequently used definition among the studies ($k_s = 19$). Half of the studies were coded as efficacy-type studies ($k_s = 14$) and the other half were effectiveness-type studies ($k_s = 14$) (see Appendix A4). The majority of treatment conditions can be characterized as trauma-focused treatment ($k_t = 28$), and a cognitive-behavioral intervention ($k_t = 17$); most of the treatment was provided in an individual format ($k_t = 33$). Treatment were mostly delivered in an outpatient setting ($k_t = 16$).

The weighted mean number of sessions was 26.1 (*SD* = 15.0, range = 2 – 78 sessions), and the mean duration of each session was 70.6 minutes (*SD* = 19.8, range = 53 – 120 min). Furthermore, most treatments were manualized (k_t = 33) and culturally adapted (k_t = 18). Most of the therapists had an elevated experience level (k_t = 22). The weighted mean age of participants in treatment conditions was 40.4 years (*SD* = 7.0, range = 21 – 51 years), and 45.70% were women (*SD* = 17.0, range = 0 – 82%). Around one-third of (27.22%) participants had an insecure asylum status (*SD* = 36.5, range = 0 – 100%), and the mean duration of stay in the country of resettlement was 113.6 months (i.e., 9.5 years; *SD* = 68.3, range = 3 – 203 months). In k_t = 13 samples, participants mainly came from the countries that can be grouped as Northern Africa and Western Asia. PTSD was the most common main diagnosis (k_t = 29). On average, 13.63 % (SD = 19.2) of participants were employed, 59.39% (*SD* = 25.7) had college level education and 55.58% (*SD* = 22.0) were in committed relationships; however, note that for these variables data was available for only less than one third of included studies.

Figure 2.1

PRISMA Flow Diagram



Note. n = number of studies. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analysis.

Dropout rate

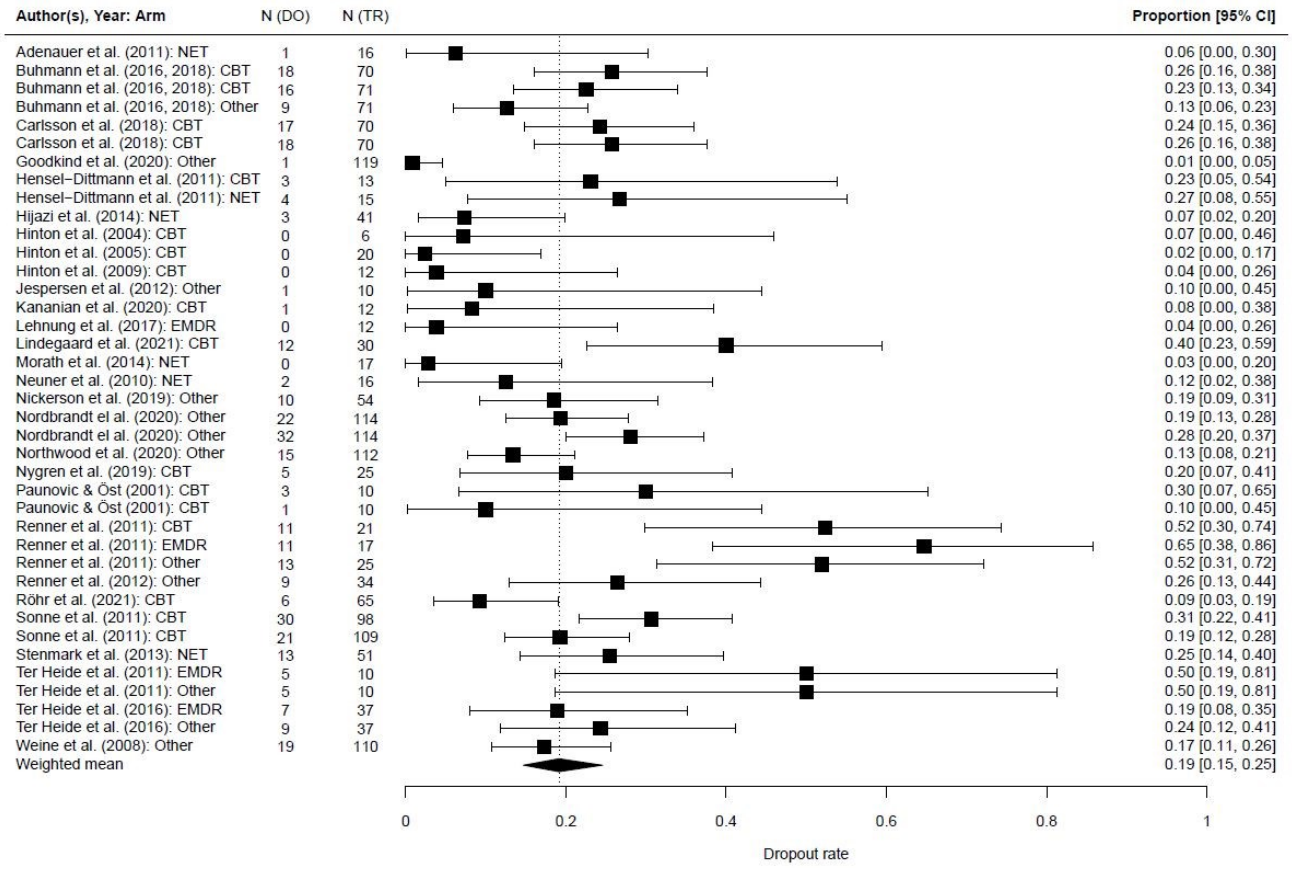
The weighted average dropout rate across all studies and active treatment conditions was 19.14%, 95%CI [14.66%, 24.60%], ranging from 0% to 64.7%. There was high heterogeneity between studies, $Q(38) = 105.26$, $p < .0001$, $I^2 = 74.76$, 95% CI[67.79, 79.66]. Following the criteria of Higgins et al. (2021) this heterogeneity is regarded *substantial.* The between-study effect explained 69.55% of the total variance, whereas 5.21% was attributed to

the within-study heterogeneity. The dropout rate for individual studies and treatment conditions are displayed in the forest plot (Figure 2.2).

The pooled OR was OR = 0.52, 95% CI [0.46, 0.59] (see Appendix A5, Figure A5.1 for a Forest Plot of log OR), which suggests that dropout was less frequent in the treatment condition compared to the control condition. The heterogeneity was not statistically significant, Q(26) = 27.22, p = .40, I2 = 15.23, 95% CI [-52.79, 46.19]; here, 15.23% of the total variance was explained by the between-study effect and the remaining (84.77%) was attributed to the sampling variance. This observation implies that the heterogeneity is potentially not important for OR, according to the criteria of Higgins et al. (2021).

Figure 2.2

Forest Plot of Dropout rate



Note. N = number of participants, DO = Dropout, TR = Treatment, CI = Confidence Interval, CBT = Cognitive-Behavioral Therapy, NET = Narrative Exposure Therapy, EMDR = Eye

Movement Desensitization and Reprocessing. Zero frequency was trimmed by adding up a small constant for the computation purpose.

Subgroup Analyses

Study Characteristics

The analyses of study characteristics as potential moderators revealed significant differences in the dropout rate between the countries in which the studies were conducted, $Q(7) = 24.03$, $p < .01$, with the highest reported dropout rates in studies coming from Austria. In contrast, the dropout rate was not moderated by study type or the method used to operationalize dropout (see Table 2.2).

Sample Characteristics

The main diagnosis of participants and their main country of origin did not significantly predict the dropout rate (see Table 2.2).

Treatment-Related Variables

There were no significant differences in the dropout rate between the treatment-related variables after α-adjustment for multiple testing. However, there was a non-significant trend (after correction for multiple testing) for the different treatment formats, $Q(2) = 8.43$, $p = .01$, with higher dropout rates in individual and group treatment compared to combined treatment. Note however, that our database had only one study that tested a combined treatment approach (Table 2.2). The dropout rate did not differ significantly between treatment orientation groups, main treatment target, manualization, whether or not medication was allowed, cultural adaption, or treatment setting.

Therapist Characteristics

Only two moderators, specifically, the experience level of therapists and the attendance of an interpreter, were submitted to the subgroup analyses. This is because other moderators concerning the therapist characteristics (age, gender, race) had a large number of missing

values, which prevented us from forming interpretable analyses. There was no significant influence of the therapist characteristics on the dropout rate (see Table 2.2).

Table 2.2

Results from Subgroup Analysis on the Dropout Rate

Moderator (k_l)	Dropout rate (%)	95% CI (%)	*Q*	*p*	*adj. α*
Study Characteristics					
Country of study (39)			24.03	.001*	.004
Denmark (10)	22.7	15.6 – 31.8			
Germany (8)	11.4	6.2 – 20.1			
USA (7)	9.5	5.4 – 16.0			
Austria (4)	42.8	25.7 – 61.7			
Sweden (4)	27.9	15.4 – 45.2			
Netherlands (4)	32.0	17.5 – 51.2			
Norway (1)	25.5	10.1 – 51.1			
Australia (1)	18.5	6.7 – 41.8			
Study Type (39)			0.0003	.99	.05
Efficacy (18)	19.0	12.4 – 28.0			
Effectiveness (21)	18.9	13.1 – 26.6			
Operationalization of Dropout (39)			2.1	.55	.036
Duration-based (4)	24.9	11.0 – 47.1			
Completion-based (23)	16.6	11.6 – 23.2			
Missing appointment (11)	24.2	14.0 – 38.3			
Therapist judgement (1)	12.5	1.9 – 51.9			
Sample Characteristics					
Main diagnosis (33)			0.25	.88	.046
PTSD (29)	19.2	14.9 – 24.4			
Depression (3)	22.3	12.5 – 36.6			
No diagnosis (1)	18.5	6.6 – 42.4			
Country of Origin (29)			6.67	.25	.018
Sub-Saharan Africa (1)	24.3	5.9 – 62.2			
Northern Africa and Western Asia (13)	17.7	11.2 – 26.7			
Central and Southern Asia (5)	10.3	4.0 – 24.0			
Eastern and South-Eastern Asia (4)	8.3	2.7 – 22.7			
Europe and Northern America (5)	31.5	15.7 – 53.1			
ambiguous (2 regions same nr.) (1)	18.9	4.2 – 55.3			
Treatment-Related Variables					
Treatment orientation (39)			2.09	.55	.039
CBT (17)	21.7	15.3 – 29.8			
NET (6)	14.6	7.5 – 26.6			
EMDR (4)	23.3	12.5 – 39.3			
Other (12)	18.2	12.5 – 25.6			
Main Treatment Target (38)			0.72	.70	.043
Trauma-focused (28)	19.2	13.6 – 26.5			
Depression (3)	22.6	10.2 – 42.6			
Other (7)	15.6	8.8 – 26.3			
Treatment format (39)			8.43	.01	.007
Individual (33)	20.7	16.0 – 26.2			
Group (5)	19.6	10.5 – 33.5			
Combination (1)	0.8	0.1 – 7.7			

Manualization (39)			0.51	.47	.032
No (6)	16.8	10.6 – 25.6			
Yes (33)	19.6	14.8 – 25.4			
Medication allowed (27)			2.81	.09	.011
No (2)	34.8	20.6 – 52.3			
Yes (25)	22.1	19.1 – 25.3			
Cultural adaption (27)			0.74	.39	.029
No (11)	24.5	16.7 – 34.6			
Yes (18)	20.0	15.1 – 26.1			
Treatment setting (38)			4.60	.33	.025
Outpatient treatment (16)	22.5	14.4 – 33.4			
University-affiliated institution (9)	13.6	6.7 – 25.9			
Refugee health care institution (4)	31.3	14.2 – 55.6			
Online intervention (6)	13.8	7.5 – 24.2			
Other (3)	22.6	11.0 – 40.7			
Therapist Characteristics					
Therapist experience level (38)			6.28	.09	.014
Trainee (3)	27.3	15.2 – 44.1			
Experienced (22)	22.0	15.9 – 29.6			
Mixed (6)	21.3	12.2 – 34.5			
No therapist (7)	12.7	7.9 – 19.8			
Interpreter (37)			1.21	.27	.021
No (14)	18.1	12.6 – 25.7			
Yes (23)	22.9	17.1 – 30.0			

Note. k_t = number of treatment condition, Q = Cochrane's Q, CI = Confidence Interval, adj. α= Adjusted alpha-level after Benjamini-Hochberg approach, PTSD = Posttraumatic Stress Disorder, CBT = Cognitive-Behavioral Therapy, NET = Narrative Exposure Therapy, EMDR = Eye Movement Desensitization and Reprocessing.

Meta-regression analyses

Study Characteristics

No relation was found for the year of study publication and the sample size on the reported dropout rate (see Table 2.3).

Sample Characteristics

There were no significant differences in the dropout rate between the sample characteristics after α-adjustment for multiple testing. However, there was a non-significant trend (after correction for multiple testing) for the duration of stay in the country of resettlement, $p = .03$, as well as the asylum status, $p = .02$. This trend indicated higher dropout rates in studies

with longer mean duration of stay in the host country and a lower proportion of insecure asylum cases in the studies. The dropout rate was unrelated with distributions of age, gender, marital status, employment status or education level (see Table 2.3).

Treatment-Related Variables

There was no significant moderation of the dropout rate by the number and duration of treatment session in the included treatment conditions (see Table 2.3).

Table 2.3

Results from Meta-regression Analyses on the Dropout Rate (Log-transformed)

Moderator (k_t)	Beta	95% CI	*p*	*adj.α*
Study characteristics				
Year of Study Publication (39)	-0.01	-0.08, 0.05	.68	.032
Sample Size (39)	-0.00	-0.00, 0.00	.74	.036
Sample characteristics				
Age (25)	0.05	-0.01, 0.11	.08	.014
Gender (30): % female	-0.01	-0.03, 0.02	.61	.023
Marital (12): % committed relationship	-0.00	-0.03, 0.02	.90	.045
Employment (13): % employed	0.00	-0.02, 0.02	.85	.036
Education (11): % college-level	0.01	-0.01, 0.03	.35	.018
Asylum Status (14): % insecure	-0.01	-0.03, -0.00	.02	.005
Month since arrival in host country (19)	0.01	0.00, 0.01	.03	.009
Treatment characteristics				
Number of Treatment Session (34)	-0.00	-0.02,0.02	.97	.05
Duration of Treatment Session (23)	-0.00	-0.02, 0.02	.68	.027

Note. k_t = number of treatment conditions, CI = Confidence Interval, adh. α = Benjamini-Hochberg corrected alpha level, Regression models were estimated separately for each predictor

Risk of Bias

Overall, two studies (7.1%) were rated as low risk of bias, 18 studies (64.3%) showed some concerns and 8 studies (28.6%) had a high risk of bias (for details see Appendix A6., Figure A6.2). The majority of studies did not show indications for performance bias (deviation from the intended intervention) (82.1%), and provided complete outcome data or appropriate methods to correct for missingness in the outcome data (attrition bias) (64.3%). Exactly half of

the studies were judged as low risk for selection bias, i.e., the risk of bias arising from the randomization process, and for reporting bias. The detection bias, as the risk arising from inappropriate measures for and the nonexistent blinding of the outcome assessment was at low risk for 46.4% of the studies. No study showed a high risk of bias on this domain. In addition, some concerns for the risk of bias due to researcher allegiance was found in 10 studies (35.7%). These concerns were caused by researchers that were involved in the development of the treatment manuals also being (co -) authors of the trial (see Appendix A6 for a detailed evaluation).

Overall, the quality of assessing, reporting and handling dropout was rated as low quality for the majority of studies (k_s = 20; 71.4 %), as satisfactory for k_s = 5 studies (17.9%), and as high quality for k_s = 3 studies (10.7%). The low quality in the overall assessment resulted mostly from a lack of a definition of dropout, this being the case for k_s = 20 studies (71.4%) (see Table A7.1 and Table A7.2 for details).

Discussion

Prevalence of Dropout in Refugees

The first aim of this meta-analysis was to investigate the prevalence of dropout from psychological and psychosocial interventions in refugees and asylum seekers. Across 39 psychological and psychosocial interventions, we found an average weighted dropout rate of 19.14%, 95% CI [14.66%, 24.60%]. The *OR* comparing active treatment conditions with control conditions was 0.52, 95% CI [0.46, 0.59], implying that patients in the treatment condition are less likely to dropout compared to the control condition.

It has been widely believed that the cultural differences in the perception of mental health and psychological treatment might lead to enhanced dropout rates among refugees and asylum seekers (e.g. Barrett et al., 2008). Similarly, Slobodin and de Jong (2015) suggested that language barriers and communication difficulties as well as a high frequency in changing

residence and contact details may increase the likelihood of dropout. However, in contrast to this view, our meta-analysis indicates that the average dropout rate is comparable to those reported in previous meta-analyses on Western populations (e.g., 19.7% in Swift & Greenberg, 2012). This observation raises an important question: Why is the average dropout rate of 20% found so universally in psychological treatments with different populations? A number of possible explanations are conceivable. First, dropout rates can be expected to be dependent on a multitude of factors, some of which increase the likelihood of dropout whereas others increase the likelihood of staying in treatment. The hypothesis that dropout should be higher in refugee populations than in Western populations is usually based on the existence of specific barriers and challenges as well as ongoing post-migration stressors (Bhatia & Wallace, 2007; Böttche et al., 2016; Liedl et al., 2016; Porter & Haslam, 2005; Priebe et al., 2016; van Loon et al., 2011) that are expected to increase the likelihood of dropout. However, this view is mainly focused on only one part of the equation. On the other side, high symptom severities and associated burden in refugees and asylum seekers make them urgently in need of therapeutic support, which may partly compensate the negative effects of treatment barriers, decreasing the average dropout rate to a level that is similar to the one found in Western populations. This reasoning is also in line with our finding that dropout was quite substantial in the control conditions of the different RCTs, whereas it was significantly lower in the active treatment conditions where support was offered for patients' mental health problems. Second, the hypothesis on prevalence and predictors of dropout in refugees are based on commonly held beliefs in Western professionals. It is conceivable that these assumptions are less relevant for acceptability and retention to treatment or even not true at all. Third, previous studies have highlighted the role of therapist's experience level (Roos & Werbart, 2013; Swift & Greenberg, 2012), and the strength of the therapeutic alliance (Roos & Werbart, 2013; Sharf et al., 2010), as well as specific perceptions (Liedl et al., 2016) and expectations (Barrett et al., 2008; Priebe et al., 2016; Zimmermann et al., 2017) patients perceive about mental health treatment. Notably,

most of the interventions included in this meta-analysis were manualized (k_t = 33), specifically adapted to overcome barriers and challenges in treatments provided for refugees and asylum seekers (k_t = 18), and were offered by therapists with a high level of experience (k_t = 22 on an elaborate level), which may have boosted the retention rate in these studies, leading to less dropout than would be expected in this population under different circumstances. Fourth, psychotherapeutic processes might be more universal than typically assumed and therefore might go beyond the influence of cultural differences on the dropout rate. Finally, frequently documented challenges, such as language barriers, cultural differences, or ongoing post-migration stressors (Bhatia & Wallace, 2007; Böttche et al., 2016; Liedl et al., 2016; Porter & Haslam, 2005; Priebe et al., 2016; van Loon et al., 2011), may have a higher impact on access to treatment when compared to retention in treatment, at least when this treatment is delivered by experienced therapists and tailored to the specific needs in this population.

Predictors of Dropout

Importantly, with dropout rates ranging from 0 to 65% there was considerable heterogeneity between studies. The second aim of the meta-analysis was, therefore, to identify moderators for dropout in refugees and asylum seekers. Although we were aware that some moderator variables had missing values, we believe that these exploratory analyses are informative if an appropriate caution was used when interpreting the results.

Subgroup analyses and meta-regressions did not reveal any significant predictors for dropout after correction for multiple testing. The only significant predictor was study origin country, whereby dropout rates were significantly higher in studies from Austria than in all other countries. Note, however, that there was only a small number of studies from Austria, which render this finding very preliminary. If systematic differences between countries are replicated in future research, it would be important to investigate systematic differences between patient characteristics, post-migration stressors or the organization and content of treatments delivered that may underlie these effects.

It is worth noting that none of the other study, sample, treatment or therapist characteristics included in the analyses had a significant impact on the dropout rate. Thus, previous findings on predictors of dropout in Western samples cannot be immediately generalized into refugee populations. For example, there is strong evidence in Western samples for the influence of patients' diagnosis (personality and eating disorders) on dropout rates (McMurran et al., 2010; Swift & Greenberg, 2012; Zimmermann et al., 2017). Note that the present meta-analysis mainly covered PTSD and depression. Therefore, it remains unclear whether particular disorders such as personality and eating disorders are predictive of dropout in a refugee sample. Given that these disorders are known to be associated with dropout in Western samples, future research should investigate a wider range of disorders to clarify the disorder-specific effects in refugee populations. Studies further suggest an association with participants' age (Barrett et al., 2008; Swift & Greenberg, 2012; Winkler, 2018), gender (Swift & Greenberg, 2012; Zimmermann et al., 2017) and education level (Zimmermann et al., 2017). In addition, Swift and Greenberg (2012) showed a moderation by treatment-related variables such as time limitation, manualization and setting.

How can the overall lack of replication of potential moderators in refugee populations be accounted for? First, the variance on many of these potential moderators was only limited in our analysis. For example, in the majority of studies trauma-focused interventions were used and provided by therapists with a high level of experience, leading to a reduction of variability on this predictor variable. Second, several candidate variables were not reported in all studies. These missing values reduced the statistical power, which might be critical for the multiple tests with the adjusted false discovery rate. An alternative explanation, however, may be that findings on predictors for dropout in Western samples may not similarly apply to treatment of refugees. In the current literature, there are no studies primarily focusing dropout in treatment of refugees. Therefore, future studies are needed that are carefully designed to specifically investigate

dropout, testing a large set of potential predictors, including valid predictors that we know from studies on Western samples as well as novel, more refugee-specific variables.

In addition to potential moderators identified in studies with Western populations, the meta-analysis also included refugee-specific variables as potential moderators. In contrast to suggestions put forward in the existing literature and despite considerable variability, none of these variables emerged as a significant moderator of dropout. Although the effects did not reach statistical significance, we found preliminary indication that duration of stay as well as asylum status may be predictive of dropout, there being a trend for higher dropout rates in samples with longer mean duration of stay in the country of resettlement and lower dropout for participants with insecure asylum status. Although the non-significant nature of the findings prevents us from drawing any conclusions yet, this suggests that the role of these population-specific variables for treatment retention vs. dropout may warrant more attention in future research. Resettling in a new country can provoke various post-migration stressors (Porter & Haslam, 2005; Priebe et al., 2016) that might affect the mental health of refugees and asylum seekers (Alemi et al., 2016; Aragona et al., 2012). It can be expected that the burden of these post-migration stressors is particularly high at the beginning of a resettlement process. The psychological strain the refugees and asylum seekers experience might prevent the occurrence of premature termination of treatment. In addition, an insecure asylum status is usually perceived as a severe burden that affects the mental health of refugees and asylum seekers (Liedl et al., 2016; Priebe et al., 2016). Asylum seekers in an ongoing asylum procedure are facing fear of deportation, helplessness and uncertainty. This may increase the need for psychological support in this challenging situation. Further research is needed to examine the influence of these potential predictors on dropout rates.

Limitations

A number of limitations are noteworthy. First, although complex search strategies were used, including a comprehensive search in the gray literature, the number of eligible trials was

limited. This limits the interpretation of subgroup analysis, as for some variables, only small numbers of studies were representative, formed by basis for the different subgroups. In addition, it cannot be ruled out that a different search strategy (e.g., different databases) could have led to different results. Second, insufficient completeness of reported data for some variables of interest should be noted. Regarding the variables employment status, education and marital status for example, less than one third of the studies reported data. An incomplete dataset might influence the validity of subgroup analysis. This forced us to test variables separately as entering multiple predictors simultaneously into a meta-regression model reduced the number of studies in the analysis drastically. Third, available data did not allow comparing sample characteristics for completers and dropouts, as for the latter hardly any data was reported. Further, as reliable data on comorbid disorders was not available for most studies, it was not possible to include comorbidity in the moderator analysis. Therefore, studies should focus on providing an exhaustive report of data. Fourth, this meta-analysis focused on a set of variables based on Swift and Greenberg's (2012) meta-analysis. Although the variable set was adapted to the specific context and additional variables of interest were included, there might be other variables that influence dropout rates in treatment of refugees and asylum seekers. Important factors could be culturally specific assumptions about treatment and therapists (Barrett et al., 2008), cultural competencies of the therapist (Liedl et al., 2016) and the strength of the therapeutic alliance (Sharf et al., 2010). Fifth, the methodological quality of studies included in our meta-analysis varied. Eight studies were rated as having a high risk of bias and the majority of studies (k_s = 20; 71.4%) were rated as low quality for assessing, reporting and handling dropout. Note that the risk of bias assessment in the present meta-analysis was mainly concerned about the internal validity of findings from the meta-analyzed studies, and does not address the issues related to external validity. Therefore, the generalizability of findings to routine clinical settings needs to be addressed separately in further research.

Conclusions and Future Directions

Despite these limitations, this meta-analysis provides the first systematic review and quantitative synthesis of the prevalence of dropout and its predictors in treatments offered to refugees and asylum seekers. Results show that, reassuringly, dropout does not appear to be more prevalent in refugees and asylum seekers than in Western populations. However, this finding needs to be interpreted by keeping in mind the fact that mostly manualized and culturally-adapted interventions offered by therapists with a high level of experience were included. Clearly much more research is needed to understand moderators of dropout, which will ultimately help develop preventive strategies to reduce dropout and its adverse consequences in this population that is in urgent need of mental health treatment. Further research is also needed to investigate dropout outside the research context as well as in different conditions (i.e., low- and middle-income countries).

Preventing dropout appears highly relevant as premature termination of treatment has crucial effects for patients (Bjork et al., 2009) and therapists (Farber, 1983; Ogrodniczuk et al., 2005; Piselli et al., 2011). Current suggestions for interventions aiming to reduce dropout rates include the development and promotion of cultural competencies in service providers, enabling them to acquire a skill set to deal with deviating expectations and goals (Barrett et al., 2008; Liedl et al., 2016; Maramba & Nagayama Hall, 2002). The use of case managers (Ogrodniczuk et al., 2005) is further discussed to adapt treatment to post-migration stressors. There is initial evidence that case management in addition to CBT reduced dropout rates by 50% compared to CBT alone (Miranda et al., 2003). Although these interventions appear promising, rigorous studies testing their efficacy in reducing dropout are needed (Semmlinger & Ehring, 2020; van Loon et al., 2011).

In conclusion, the results of the current meta-analysis show that there is considerable variability regarding the handling of dropout in clinical research and treatment with refugees and asylum seekers. This variability makes it challenging to synthesize findings, and thus, we

would like to emphasize the need to develop common standards for assessment, reporting, and management of dropout in this population, while allowing for some flexibility in the choice of the method, depending on the purpose and context of assessment. In clinical practice, therapist's judgement appears to be a suitable method that can be complemented by objective outcome monitoring (clinically significant symptom change). In contrast, clinical research would benefit from higher comparability of findings across studies. Therefore, a duration- or dose-based operationalization method should be used here. Further, we recommend providing comprehensive information on the dropout cases (i.e., sociodemographic data, reasons for dropout, time point).

References Publication II

Alemi, Q., Stempel, C., Baek, K., Lares, L., Villa, P., Danis, D., & Montgomery, S. (2016). Impact of Postmigration Living Difficulties on the Mental Health of Afghan Migrants Residing in Istanbul. *International Journal of Population Research*, *2016*(2). https://doi.org/f94g

Aragona, M., Pucci, D., Mazzetti, M., & Geraci, S. (2012). Post-migration living difficulties as a significant risk factor for PTSD in immigrants: A primary care study. *Italian Journal of Public Health*, *9*(3), e7525–e7528. https://doi.org/10.2427/7525

Barrett, M. S., Chua, W. J., Crits-Christoph, P., Gibbons, M. B., Casiano, D., & Thompson, D. (2008). Early Withdrawal from mental health treatment: Implications for Psychotherapy Practice. *Psychotherapy*, *45*(2), 247–267. https://doi.org/fnv2dh

Benjamini, Y., & Hochberg, Y. (1995). Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society. Series B (Methodological)*, *57*(1), 289–300. http://www.jstor.org/stable/2346101

Bhatia, R., & Wallace, P. (2007). Experiences of refugees and asylum seekers in general practice: a qualitative study. *BMC Family Practice*, *8*(1), 48. https://doi.org/dh82fh

Bjork, T., Bjorck, C., Clinton, D., Sohlberg, S., & Norring, C. (2009). What happened to the ones who dropped out? Outcome in eating disorder patients who complete or prematurely terminate treatment. *European Eating Disorders Review : The Journal of the Eating Disorders Association*, *17*(2), 109–119. https://doi.org/10.1002/erv.911

Bogic, M., Ajdukovic, D., Bremner, S., Franciskovic, T., Galeazzi, G. M., Kucukalic, A., Lecic-Tosevski, D., Morina, N., Popovski, M., Schutzwohl, M., Wang, D., & Priebe, S. (2012). Factors associated with mental disorders in long-settled war refugees: refugees from the former Yugoslavia in Germany, Italy and the UK. *The British Journal of Psychiatry : The Journal of Mental Science*, *200*(3), 216–223. https://doi.org/fzcwwq

Böttche, M., Heeke, C., & Knaevelsrud, C. (2016). Sequenzielle Traumatisierungen, Traumafolgestörungen und psychotherapeutische Behandlungsansätze bei kriegstraumatisierten erwachsenen Flüchtlingen in Deutschland. [Sequential traumatizations, trauma sequelae and psychological treatment approaches for war-traumatized adult refugees in Germany]. *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, *59*(5), 621–626

Cinkaya, F. (2016). Die Vielfalt von Abbrüchen in der Psychotherapie. Eine Metaanalyse. *[The Multiplicity of Dropouts in Psychotherapy: A Meta-Analysis]*. *Kovac*

Crumlish, N., & O'Rourke, K. (2010). A systematic review of treatments for post-traumatic stress disorder among refugees and asylum-seekers. *The Journal of Nervous and Mental Disease*, *198*(4), 237–251. https://doi.org/cjb8kq

Farber, B. A. (1983). Psychotherapists' perceptions of stressful patient behavior. *Professional Psychology: Research and Practice*, *14*(5), 697–705. https://doi.org/dq4jn8

Fernandez, E., Salem, D., Swift, J. K., & Ramtahal, N. (2015). Meta-analysis of dropout from cognitive behavioral therapy: Magnitude, timing, and moderators. *Journal of Consulting and Clinical Psychology*, *83*(6), 1108–1122. https://doi.org/10.1037/ccp0000044

Garfield, S. L. (1986). Research on client variables in psychotherapy. In S. L. Garfield & A. E. Bergin (Eds.), *Hand Book of Psychotherapy and Behavior Change* (3rd. ed., pp. 213–256). New York: Wiley.

Garfield, S. L. (1994). Research on client variables in psychotherapy. In S. L. Garfield & A. E. Bergin (Eds.), *Handbook of psychotherapy and behavior change.* (4th. ed., pp. 190–228). New York: Wiley.

Hargreaves, S. (2002). A body of evidence: torture among asylum seekers to the West. *Lancet*, *359*(9308), 793–794. https://doi.org/dxbgsd

Hatchett, G. T., & Park, H. L. (2003). Comparison of Four Operational Definitions of Premature Termination. *Psychotherapy: Theory, Research, Practice, Training*, *40*(3), 226–231. https://doi.org/d9m44j

Higgins, J. P., Savović, J., Page, M. J., & Sterne, J. A. C. (2019). *Revised Cochrane risk-of-bias tool for randomized trials (RoB 2). Short Version (Cribsheet)* https://methods.cochrane.org/risk-bias-2

Higgins, J. P. T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (2021). *Cochrane Handbook for Systematic Reviews of Interventions. Version 6.2*. Cochrane, 2021. Availabe from www.training.cochrane.org/handbook.

Higgins, J. P. T., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ (Clinical Research Ed.)*, *327*(7414), 557–560. https://doi.org/dhbjj6

Imel, Z. E., Laska, K., Jakupcak, M., & Simpson, T. L. (2013). Meta-Analysis of Dropout in Treatments for Posttraumatic Stress Disorder. *Journal of Consulting and Clinical Psychology*, *81*(3), 394–404. https://doi.org/10.1037/a0031474

Kalt, A., Hossain, M., Kiss, L., & Zimmerman, C. (2013). Asylum seekers, violence and health: a systematic review of research in high-income host countries. *American Journal of Public Health*, *103*(3), e30-42. https://doi.org/10.2105/AJPH.2012.301136

Kip, A., Priebe, S., Holling, H., & Morina, N. (2020). Psychological interventions for posttraumatic stress disorder and depression in refugees: A meta-analysis of randomized controlled trials. *Clinical Psychology&Psychotherapy*. *27*,489-503. https://doi.org/ghxzrj

Lambert, M. J. (2007). Presidential address: What we have learned from a decade of research aimed at improving psychotherapy outcome in routine care. *Psychotherapy Research*, *17*(1), 1–14.

Lewis, C., Roberts, N. P., Gibson, S., & Bisson, J. I. (2020). Dropout from psychological therapies for post-traumatic stress disorder (PTSD) in adults: systematic review and meta-analysis. *European Journal of Psychotraumatology*, *11*(1), 1709709. https://doi.org/ggw2wb

Liedl, A., Böttche, M., Abdallah-Steinkopff, B., & Knaevelsrud, C. (2016). *Psychotherapie mit Flüchtlingen-neue Herausforderungen, spezifische Bedürfnisse: Das Praxisbuch für Psychotherapeuten und Ärzte*. *[Psychotherapy with refugees- new challenges, specific needs: The practice book for psychotherapists and doctors]*. Schattauer Verlag.

Maramba, G. G., & Nagayama Hall, G. C. (2002). Meta-analyses of ethnic match as a predictor of dropout, utilization, and level of functioning. *Cultural Diversity and Ethnic Minority Psychology*, *8*(3), 290–297. https://doi.org/10.1037/1099-9809.8.3.290

McMurran, M., Huband, N., & Overton, E. (2010). Non-completion of personality disorder treatments: A systematic review of correlates, consequences, and interventions. *Clinical Psychology Review*, *30*, 277–287. https://doi.org/10.1016/j.cpr.2009.12.002

Miranda, J., Azocar, F., Organista, K. C., Dwyer, E., & Areane, P. (2003). Treatment of Depression Among Impoverished Primary Care Patients From Ethnic Minority Groups. *Psychiatric Services*, *54*(2), 219–225. https://doi.org/10.1176/appi.ps.54.2.219

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., Altman, D., Antes, G., Atkins, D., Barbour, V., Barrowman, N., & Berlin, J. A. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement (Chinese edition). *Journal of Chinese Integrative Medicine*, *7*(9), 889–896.

Nickerson, A., Bryant, R. A., Silove, D., & Steel, Z. (2011). A critical review of psychological treatments of posttraumatic stress disorder in refugees. *Clinical Psychology Review, 31*(3), 399–417. https://doi.org/fxd6wm

Nose, M., Ballette, F., Bighelli, I., Turrini, G., Purgato, M., Tol, W., Priebe, S., & Barbui, C. (2017). Psychosocial interventions for post-traumatic stress disorder in refugees and asylum seekers resettled in high-income countries: Systematic review and meta-analysis. *PLOS ONE*, *12*(2). https://doi.org/gg2rxk

Ogrodniczuk, J. S., Joyce, A. S., & Piper, W. E. (2005). Strategies for Reducing Patient-Initiated Premature Termination of Psychotherapy. *Harvard Review of Psychiatry*, *13*(2), 57–70. https://doi.org/d93267

Piselli, A., Halgin, R., & MacEwan, G. (2011). What went wrong? Therapists' reflections on their role in premature termination. *Psychotherapy Research*, *21*(4), 400–415. https://doi.org/bvtwrt

Porter, M., & Haslam, N. (2005). Predisplacement and postdisplacement factors associated with mental health of refugees and internally displaced persons: a meta-analysis. *JAMA*, *294*(5), 602–612. https://doi.org/10.1001/jama.294.5.602

Priebe, S., Giacco, D., & El-Nagib, R. (2016). *Public health aspects of mental health among migrants and refugees: a review of the evidence on mental health care for refugees, asylum seekers and irregular migrants in the WHO European Region*. World Health Organization. Regional Office for Europe.

Roos, J., & Werbart, A. (2013). Therapist and relationship factors influencing dropout from individual psychotherapy: a literature review. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, *23*(4), 394–418. https://doi.org/f23svd

Ryan, D., Dooley, B., & Benson, C. (2008). Theoretical Perspectives on Post-Migration Adaptation and Psychological Well-Being among Refugees: Towards a Resource-Based Model. *Journal of Refugee Studies*, *21*(1). https://doi.org/10.1093/jrs/fem047

Sandhu, S., Bjerre, N. V, Dauvrin, M., Dias, S., Gaddini, A., Greacen, T., Ioannidis, E., Kluge, U., Jensen, N. K., Lamkaddem, M., Puigpinós i Riera, R., Kósa, Z., Wihlman, U., Stankunas, M., Straßmayr, C., Wahlbeck, K., Welbel, M., & Priebe, S. (2013). Experiences with treating immigrants: a qualitative study in mental health services across 16 European countries. *Social Psychiatry and Psychiatric Epidemiology*, *48*(1), 105–116. https://doi.org/f24v2v

Semmlinger, V. & Ehring, T. (2020). *Predicting and Preventing Dropout in Research, Assessment and Treatment with Refugees* [Manuscript submitted for publication]. Department of Psychology, Ludwig-Maximilians-University, Munich.

Sharf, J., Primavera, L. H., & Diener, M. J. (2010). Dropout and therapeutic alliance: A meta-analysis of adult individual psychotherapy. *Psychotherapy: Theory, Research, Practice, Training*, *47(4)*, 637–645. https://doi.org/10.1037/a0021175

Silove, D., Brooks, R., Bateman Steel, C. R., Steel, Z., Hewage, K., Rodger, J., & Soosay, I. (2009). Explosive anger as a response to human rights violations in post-conflict Timor-Leste. *Social Science & Medicine (1982)*, *69*(5), 670–677. https://doi.org/c3tcdb

Slobodin, O., & de Jong, J. T. V. M. (2015). Mental health interventions for traumatized asylum seekers and refugees: What do we know about their efficacy? *International Journal of social psychiatry, 61*(1), 17–26. https://doi.org/f6z2qz

Sterne, J. A. C., Savović, J., Page, M. J., Elbers, R. G., Blencowe, N. S., Boutron, I., Cates, C. J., Cheng, H. Y., Corbett, M. S., Eldridge, S. M., Hernán, M. A., Hopewell, S., Hróbjartsson, A., Junqueira, D. R., Jüni, P., Kirkham, J. J., Lasserson, T., Li, T., McAleenan, A., … Higgins, J. P. T. (2019). RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ (Clinical Research Ed.)*, *366*. https://doi.org/ggmfc5

Swift, J. K., Callahan, J., & Levine, J. C. (2009). Using clinically significant change to identify premature termination. *Psychotherapy*, *46*(3), 328–335. https://doi.org/cqhwfv

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *Journal of Consulting and Clinical Psychology*, *80*(4), 547–559. https://doi.org/f38mgc

Thompson, C. T., Vidgen, A., & Roberts, N. P. (2018). Psychological interventions for post-traumatic stress disorder in refugees and asylum seekers: A systematic review and meta-analysis. *Clinical Psychology Review, 63*, 66–79. https://doi.org/gd2xp7

Tol, W. A., Purgato, M., Bass, J. K., Galappatti, A., & Eaton, W. (2015). Mental health and psychosocial support in humanitarian settings: a public mental health perspective. *Epidemiology and Psychiatric Sciences*, *24*(6), 484–494. https://doi.org/f7x9db

Turrini, G, Purgato, M., Acarturk, C., Anttila, M., Au, T., Ballette, F., Bird, M., Carswell, K., Churchill, R., Cuijpers, P., Hall, J., Hansen, L. J., Kösters, M., Lantta, T., Nosè, M., Ostuzzi, G., Sijbrandij, M., Tedeschi, F., Valimaki, M., … Barbui, C. (2019). Efficacy and acceptability of psychosocial interventions in asylum seekers and refugees: Systematic review and meta-analysis. *Epidemiology and Psychiatric Sciences*, *28*(4), 376–388. https://doi.org/gg2rxf

Turrini, G. , Purgato, M., Ballette, F., Nose, M., Ostuzzi, G., & Barbui, C. (2017). Common mental disorders in asylum seekers and refugees: umbrella review of prevalence and intervention studies. *International Journal of Mental Health Systems*, *11*, 51. https://doi.org/gg2rxj

United Nation High Commissioner for Refugees, UNHCR (2011). *UNHCR Resettlement Handbook. Division of International Protection*. https://www.unhcr.org/4a2ccf4c6.html

United Nation High Commissioner for Refugees, UNHCR (2020). *Global Trends. Forced Displacement in 2019*. https://www.unhcr.org/5ee200e37.pdf

United Nations. (2020). *SDG Indicators. Regional groupings used in Report and Statistical*

Annex. Department of Economic and Social Affairs. https://unstats.un.org/sdgs/indicators/regional-groups/

Van Loon, A., van Schaik, D. J. F., Dekker, J. J., & Beekman, A. T. F. (2011). Effectiveness of an intercultural module added to the treatment guidelines for Moroccan and Turkish patients with depressive and anxiety disorders. *BMC Psychiatry*, *11*, 13. https://doi.org/cv8ffz

Varker, T., Jones, K. A., Arjmand, H.-A., Hinton, M., Hiles, S. A., Freijah, I., Forbes, D., Kartal, D., Phelps, A., Bryant, R. A., McFarlane, A., Hopwood, M., & O'Donnell, M. (2021). Dropout from guideline-recommended psychological treatments for posttraumatic stress disorder: A systematic review and meta-analysis. *Journal of Affective Disorders Reports*, *4*, 100093. https://doi.org/f94s

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, *36*(3), 1–48. https://www.jstatsoft.org/v36/i03/

Wierzbicki, M., & Pekarik, G. (1993). A meta-analysis of psychotherapy dropout. *Professional Psychology: Research and Practice*, *24(*2), 190–195. https://doi.org/c588d2

Winkler, R. (2018). *Dropout in Psychotherapien. LBI-HTA Projektbericht. [Dropout in psychotherapy. LBI-HTA Project report]*. Ludwig Blotzmann Institut für Health Technology Assessment. https://eprints.aihta.at/1157/1/HTA-Projektbericht_Nr.100.pdf.

Zimmermann, D., Rubel, J., Page, A. C., & Lutz, W. (2017). Therapist effects on and predictors of non-consensual dropout in psychotherapy. *Clinical Psychology & Psychotherapy*, *24*(2), 312–321.

Publication III:

Dropout from trauma-focused treatment for PTSD in a naturalistic setting

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Dropout from trauma-focused treatment for PTSD in a naturalistic setting

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Abstract

Background: Although evidence-based interventions for posttraumatic stress disorder (PTSD) are highly effective, on average about 20% of patients drop out of treatment. Despite considerable research investigating PTSD treatment dropout in randomized controlled trials (RCTs), findings in naturalistic settings remain sparse. ***Objective:*** Therefore, the present study investigated the frequency and predictors of dropout in trauma-focused interventions for PTSD in routine clinical care. ***Method:*** The sample included n = 195 adults with diagnosed PTSD, receiving trauma-focused, cognitive behavioral therapy in routine clinical care in three outpatient centers. We conducted a multiple logistic regression analysis with the following candidate predictors of dropout: patient variables (e.g., basic sociodemographic status and specific clinical variables) as well as therapist's experience level and gender match between therapist and patient. ***Results:*** Results showed a dropout rate of 15.38%. Age (higher dropout probability in younger patients) and living situation (living with parents predicted lower dropout probability compared to living alone) were significant predictors of dropout. Dropout was not significantly associated with the therapist's experience level and gender match. ***Conclusions:*** In conclusion, routinely assessed baseline patient variables are associated with dropout. Ultimately, this may help to identify patients who need additional attention to keep them in therapy.

Keywords: Treatment Dropouts, Posttraumatic Stress Disorder, Prediction, Psychotherapy, Clinical Practice, Naturalistic Setting

Highlights

- About 15% of patients receiving PTSD treatment in routine clinical care dropped out
- This rate is lower than found in previous studies
- Age and living situation were the only variables related to dropout

1-Sentence-Teaser

Approximately 15% of patients terminate PTSD treatment in routine clinical care prematurely, with baseline patient variables, namely age and living situation, being associated with dropout.

Introduction

Evidence-based interventions for posttraumatic stress disorder (PTSD) have been shown to be highly effective (e.g., Mavranezouli et al., 2020). However, about 20% of patients receiving an intervention for PTSD drop out of treatment (e.g., Varker et al., 2021). As treatment dropout can lead to lower treatment effectiveness and reduced probability of improvement (e.g., Varker et al., 2021), PTSD treatment dropout is an important clinical challenge.

Previous research has focused on estimating the prevalence of dropout from psychological treatment in randomized controlled trials (RCTs). Varker et al. (2021) reported an average dropout rate of 20.9%, 95% CI [17.2, 24.9] from guideline-recommended psychological treatments for PTSD in RCTs. Similar dropout rates have been estimated by other previous meta-analyses that focus on a wider range of treatment orientations and settings (e.g., Lewis et al. (2020): 16%, 95% CI [14, 18]). While there is a vast body of research investigating dropout in RCTs, less is known about dropout rates from treatment for PTSD in routine clinical care. Goetter et al. (2015) estimated a dropout rate of 36%, 95% CI [26.2, 43.9] from outpatient treatment. It is important to consider, that this dropout rate was collected in a sample of veterans with combat-related PTSD. A recent meta-analysis including both RCTs and non-RCTs reported a weighted average dropout rate of 41.5% from trauma-focused CBT for PTSD (Mitchell et al., 2022).

For dropout from PTSD treatment a number of predictors have been discussed. First, baseline PTSD symptom severity might influence dropout, evidence however is mixed. While Varker et al. (2021) did not finding a significant effect, Mitchell et al. (2022) showed higher clinician-rated baseline PTSD symptom severity scores in patients dropping out of treatment compared to completers (Hedge's $g = .50$, 95% CI [-.95, -.04], $p<.05$). It is worth noting that this effect applied only to clinician-rated but not to self-rated PTSD severity. Second, comorbidity is often discussed as a possible predictor, especially comorbid depression,

generalized anxiety disorder (GAD), alcohol disorder, and borderline personality disorder (BPD) (e.g. Steindl et al., 2003). However, recent large-scale meta-analyses did not find a significant relationship between comorbidity and dropout from PTSD treatment (Mitchell et al., 2022; Snoek et al., 2021; Varker et al., 2021). Third, other pretreatment clinical variables might be associated with dropout in PTSD treatments, including difficulties in emotional regulation (Shnaider et al., 2022), childhood trauma (Miles & Thompson, 2016), and catastrophic cognitions and avoidance (Bryant et al., 2007). Note that results to date are inconsistent and findings only rely on few studies. Concerning sociodemographic variables, only for the variable age is there a reasonable indication that younger age might be predictive for dropout in PTSD treatment (Goetter et al., 2015). However, in two recent meta-analyses, none of the sociodemographic variables (including age) was found to be a consistent predictor across studies (Lewis et al., 2020; Varker et al., 2021).

The majority of studies investigating dropout in PTSD treatment have used an RCT design. Therefore, much less is known about dropout in naturalistic settings. To our knowledge, there is only one review with a veterans sample (Goetter et al., 2015) and few studies (van Minnen et al., 2002) specifically investigating dropout in routine clinical care. Transferring results from efficacy studies (RCTs) to naturalistic therapeutic settings might be problematic (Leichsenring, 2004). Despite the well-known strength of RCTs it has been discussed whether randomization in RCTs and the strict use of diagnosis specific treatment manuals impose artificial conditions that do not reflect the complexities of clinical practice. Therefore, naturalistic studies are required (Leichsenring, 2004).

The aim of the present study was to investigate the frequency and predictors of dropout in trauma-focused, guideline-recommended interventions for PTSD in routine clinical care. Due to the lack of research on the prevalence and predictors from PTSD treatment in naturalistic settings, our analyses followed an exploratory approach.

Method

Participants

Data was assessed at three university-based outpatient centers providing treatment for PTSD in Germany, located at LMU Munich (dataset 1) as well as the University of Münster and the Otto Selz Institute at the University of Mannheim (dataset 2). The sample consisted of 195 adult patients receiving treatment for PTSD. All data was collected as part of effectiveness studies evaluating trauma-focused cognitive behavioral therapy (TF-CBT) for PTSD in routine clinical care (previous, different analysis only on dataset 2: Krüger-Gottschalk et al., in preparation, Schumm et al., 2022, 2023). At pretreatment, all patients met DSM-5 diagnostic criteria for PTSD assessed via the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) (Weathers, Blake et al., 2013), and were between 18 and 65 years old. Only participants who had already terminated their treatment at the respective institution and had attended at least one treatment session were included in the study. Exclusion criteria included current psychotic disorder, current substance dependence, or current suicidal intent (First, Williams, Karg, et al., 2016). Sociodemographic and clinical characteristics of the sample are presented in Table 3.1.

Treatment

Treatment in all outpatient centers consisted of trauma-focused cognitive behavioral therapy roughly following the same treatment manual. Due to the naturalistic setting of the study, no randomization took place and there was no control condition. The treatment manual is based on empirically tested therapy concepts and follows a modularized phase-based approach. Phase 1 can be summarized as preparation for trauma-focused therapy, while Phase 2 consisted of the trauma-focused treatment itself. Phase 3 was the final phase of treatment and focused on improving quality of life, resuming activities, and relapse prevention. The treatment plan was intended to take each patient through all three phases, with the number of sessions required for each phase and the selection of modules within each phase varying from patient to

patient. Depending on the current symptomology, deviations from this phase structure had to be made in individual cases.

Treatment sessions were usually provided on a weekly basis, with a regular duration of 50 minutes. The overall average treatment length was M = 36.6 sessions (SD = 23.4), and on average patients underwent M = 5.0 (SD = 1.3) preparatory sessions. The treatments were conducted by either licensed CBT therapists (39.2%) or psychotherapists in training (60.8%) employed at the outpatient centers. Supervision by a CBT therapist with expertise in PTSD treatment was regularly provided, on average at every second session. The majority of the therapists were female (86.4%).

Measures

The baseline assessment included sociodemographic data, namely age, gender, marital status, living situation, and education. Clinical variables were assessed using clinical interviews and psychometric questionnaires. In addition, two therapist variables, i.e., experience level and gender match, were coded as potential predictors of dropout. Dropout was assessed using therapist judgment and patient-initiated termination. For each patient, we revised the patient files, analyzing the therapeutic session protocols.

Dropout

Dropout was operationalized using the therapist's judgement, and the termination had to be initiated by the patient, without a mutual agreement that termination was the best choice. Therapists routinely document this information in patient files on a treatment termination form. In exceptional cases, where no information was provided, we used an elaborate file analysis, i.e., analyzing the three last session protocols for each respective patient, to retrieve the information needed. If no or only ambiguous information could be obtained, the patient was excluded from the study.

Clinician-Administered PTSD scale for DSM-5 (CAPS-5)

The CAPS-5 (Weathers, Blake, et al., 2013) was used to assess the presence of a PTSD diagnosis. The CAPS-5 is a gold-standard clinical interview that assesses posttraumatic stress symptoms in the past month.

Structured Clinical Interview for DSM (SCID)

The SCID (First, Williams, Karg, et al., 2016) was used to assess the presence of comorbid disorders. The SCID for personality disorders (First, Williams, Smith Benjamin, et al., 2016) was administered to assess the presence of comorbid personality disorders. The SCID is a gold-standard clinical interview to assess diagnostic criteria according to the DSM.

PTSD-checklist for DSM-5 (PCL-5)

The PCL-5 (Weathers et al., 2013) was used to assess posttraumatic symptom severity. The assessment consists of 20 items, corresponding to the DSM-5 PTSD criteria. Distress caused by each symptom is rated on a five-point Likert scale ranging from 0 = *not at all* to 4 = *extremely*. Symptom severity was obtained as a sum score of all 20 items (range 0 to 80). In the current study, internal consistency was high ($\alpha = .87$). Please note that Cronbach's alpha for all analyzed questionnaires was calculated on the non-imputed dataset.

Childhood Trauma Questionnaire (CTQ-28)

Exposure to traumatic childhood experiences was assessed with the CTQ-28 (Bernstein et al., 2003). The CTQ-28 is a self-report questionnaire consisting of 28 items, rated on a five-point Likert scale ranging from 1 = *never true* to 5 = *very often true*. A sum score for all items (range 25 to 128) was calculated. In the current study, internal consistency was good ($\alpha = .95$) for the total CTQ score.

Inventory of Interpersonal Problems (IIP-32)

The IIP-32 was used to assess interpersonal problems (Horowitz et al., 2000). The self-report questionnaire contains 32 items, assessing interpersonal behavior that the participant either finds difficult or shows in excess. The items are rated on a five-point Likert scale ranging

from 0 = *not at all* to 4 = *extremely*. In the parent studies, different item versions of the questionnaire were used (IIP-127, IIP-64, IIP-32). For the main analyses, we used the IIP-32 version and narrowed the long versions down to the IIP-32. We calculated the IIP-32 total score as the mean of the eight scale scores (Horowitz et al., 2000). In the current study the internal consistency for the total IIP-32 was high (α =.90).

Dissociative Experience Scale (DES)

Dissociative symptoms were assessed with the Dissociative Experience Scale (DES) (Bernstein & Putnam, 1986). The DES is a 20-item self-report questionnaire. Items are rated on a scale ranging from 0% (*never*) to 100% (*all the time*). We used the total mean score to determine the overall dissociation. In the current study internal consistency was high α =.93.

Posttraumatic Cognitions Inventory (PTCI) and Interpretation of Symptoms Inventory (IPSI)

Posttraumatic cognitions were assessed using a combined version of the PTCI (Foa et al., 1999) and the IPSI (Dunmore et al., 1999). The self-report questionnaire assesses negative cognitions and beliefs in response to a traumatic experience (PTCI) and to posttraumatic symptoms (IPSI). The 48 items are rated on a seven-point Likert scale ranging from 1 = *totally disagree* to 7 = *totally agree.* We used the total sum score for PTCI and the IPSI mean (Ehlers, 1999). In the current study internal consistency was high for PTCI (α =.92) and IPSI (α =.92).

Difficulties in Emotion Regulation Scale (DERS)

Emotional dysregulation was assessed with the self-report questionnaire DERS (Gratz & Roemer, 2004). The 36 items are rated on a five-point Likert scale ranging from 1 = *almost never* to 5 = *almost always*. We used the DERS sum score (range 36 to 180) to determine possible difficulties in emotion regulation. In the current study, internal consistency was excellent, α =.94.

Procedure

The studies were approved by the local ethics committees at the LMU Munich, University of Münster, and the University of Mannheim. All three outpatient centers are specialized in the treatment of patients with trauma-related disorders. Participants referred to these centers were screened for eligibility. If eligible, participants received detailed information about the respective study, and written informed consent was obtained. Due to the naturalistic setting, participants were not randomized to different conditions but received standard care (see treatment). After the baseline assessment had taken place, the treatment was initiated at the next possible date.

All candidate predictor variables were assessed at baseline. The baseline assessment session consisted of clinical interviews (CAPS-5; SCID) as well as sociodemographic and clinical questionnaires. As treatment was delivered in a naturalistic setting, a substantial effort was made to prevent premature termination of treatment as part of the standard procedure.

Statistical Analyses

All statistical analyses were conducted using R (Version 4.2.0). Datasets from two parent studies were merged for the current analyses. The dropout rate was calculated as the proportion of the patients who dropped out to the total number of patients who had started the treatment. There was a notable amount of missing data in some questionnaires (M = 7%, SD = 4%, max = 27%). The missing data was assumed to be missing at random (MAR) (Bhaskaran & Smeeth, 2014), and was imputed using the iterative procedure of conditional multiple imputation technique on an item level, i.e., before calculating the respective sum score. Conditional multiple imputation was realized by the five-step procedure proposed by Rubin (1976) and Kropko et al. (2014), using the R *Multivariate Imputation by Chained Equations (mice)* package (van Buuren & Groothuis-Oudshoorn, 2011). The number of multiple imputations as well as the number of iterations were set to five (m=5, maxit=5), and we used predictive mean matching (pmm) as the imputation method for continuous variables and the

logistic regression (logreg) as the imputation method for dichotomous variables. We conducted a sensitivity analysis to ensure that the results were not affected by multicollinearity due to highly correlated items in the dataset or by the use of the multiple imputed dataset for our main analysis. Further, we conducted a sensitivity analysis to ensure that the results were not critically influenced by the multiple imputation.

First, we tested the differences in demographics and baseline symptom levels between patients who dropped out and those who did not. Next, zero-order associations were examined between dropout and the predictors of interest using point-biserial correlation on the imputed data. We then conducted a multiple logistic regression analysis (maximum likelihood estimation; imputed data) to investigate the unique effects of the variables on dropout after controlling for the effect of the other variables in the model. The level of significance was set as $\alpha = .05$. We included the following variables as potential predictors of dropout (all assessed at the beginning of treatment): age, gender, marital status, living situation, education, posttraumatic symptom severity (PCL), exposure to traumatic childhood experiences (CTQ), interpersonal problems (IIP), overall dissociation (DES), posttraumatic cognitions in response to the traumatic experience (PTCI) and to posttraumatic symptoms (IPSI), emotional dysregulation (DERS), number of previous treatments (outpatient and inpatient), number of comorbid disorders (all comorbid disorder), comorbid personality disorder, therapist's experience level (registered vs. in training), and gender match.

Although our primary focus was on the effects of each predictor on dropout, we were interested in how well the logistic regression model would predict dropout. We evaluated the prediction performance using leave-one-out cross-validation on the imputed datasets. The following three performance measures were computed (as medians across imputed datasets): accuracy (i.e., the number of patients who were correctly identified by the model as dropouts or non-dropouts divided by the total number of patients), sensitivity (i.e., the number of dropouts correctly identified as dropouts by the model divided by the number of dropouts), and

specificity (i.e., the number of non-dropouts correctly identified as non-dropouts divided by the number of non-dropouts). In addition, Receiver Operating Characteristic (ROC) analysis was performed to evaluate the discriminatory power of the logistic regression model. The area under the ROC curve (AUC) was calculated to summarize the overall performance of the model, again as median AUC across the multiple imputed datasets. The AUC typically ranges from 0 to 1, with 1 indicating the perfect separation and with 0.5 meaning random separation (or poor prediction performance).

Results

Descriptives and demographics

The sample consisted of 195 patients, with a mean age of 36.14 years (*SD* = 13.02 years). The majority of patients were female (75.9%). Ninety-six patients (56.8%) had at least one comorbid disorder. The mean baseline PTSD symptom severity (PCL) was *M* = 46.2 (*SD* = 14.5), indicating a high severity of PTSD symptoms. There was a significant association between dropout and age (see Table 3.1), but not with respect to the other variables studied. The descriptive statistics for all demographic and clinical measures of the sample are presented in Table 3.1.

Table 3.1

Descriptive Statistics of the Sample, of Dropouts, and of No Dropout at Baseline

Variable	Total n(%) / *M (SD)*	Dropout n(%) / *M (SD)*	No Dropout n(%) / *M (SD)*	*t* or χ^2 (p value)
Gender[1]				0.35 (.56)
Female	148 (75.9%)	21 (70.0%)	127 (77.0%)	
Male	47 (24.1%)	9 (30.0%)	38 (23.0%)	
Age in years[2]	36.1 (13.02)	29.97 (10.11)	37.28 (13.21)	3.40 (.001)
Marital status[3]				0.73 (.70)
Single	112 (59,6%)	19 (65.5%)	93 (58.5%)	
Married	58 (30.8%)	7 (24.1%)	51 (32.1%)	
Divorced/widowed	18 (9.6%)	3 (10.4%)	15 (9.4%)	
Living situation[2]				3.90 (.27)
Alone	41 (21.9%)	7 (24.1%)	34 (21.4%)	
With partner	106 (56.7%)	14 (48.3%)	92 (57.9%)	
With parents	23 (12.3%)	2 (10.3%)	21 (13.2%)	
Other	17 (9.1%)	5 (17.2%)	12 (7.5%)	
Highest education level[4]				4.15 (.25)
University degree	35 (18.5%)	3 (10.0%)	32 (20.1%)	
High school[a]	35 (18.5%)	9 (30.0%)	26 (16.4%)	
Secondary school[b]	102 (54.0%)	16 (53.3%)	86 (54.1%)	
Other	17 (9.0%)	2 (6.7%)	15 (9.4%)	
Previous treatment[5]				0.63 (.43)
yes	106 (58.6%)	14 (50.0%)	92 (60.1%)	
no	75 (41.4%)	14 (50.0%)	61 (39.9%)	
Comorbid PD[6]				<.001 (1.0)
yes	15 (8.6%)	2 (6.9%)	13 (8.9%)	
no	160 (91.4%)	27 (93.1%)	133 (91.1%)	
Number of CD[7]	0.98 (1.1)	0.89 (0.91)	0.99 (1.13)	0.54 (.60)
Gender match[8]				0.02 (.89)
Match	107 (73.3%)	19 (70.4%)	88 (73.9%)	
No match	39 (26.7%)	8 (29.6%)	31 (26.1%)	
Approval therapist[9]				0.02 (.89)
Licensed	56 (39.2%)	11 (42.3%)	45 (38.5%)	
Non-licensed	87 (60.8%)	15 (57.7%)	72 (61.5%)	
Clinical measures[1]				
PCL-5	46.2 (14.5)	47.0 (12.2)	46.1 (15.1)	-0.33(.74)
CTQ-28	55.2 (22.9)	49.6 (15.9)	56.2 (24.2)	1.46 (.15)
IIP-32	1.6 (0.6)	1.6 (0.5)	1.7 (0.7)	0.54 (.59)
DES	2.0 (1.8)	2.2 (1.5)	2.0 (1.9)	-0.55 (.58)
PTCI	131.7 (36.3)	135.3 (33.2)	131.0 (37.6)	-0.59 (.55)
IPSI	3.5 (1.5)	4.0 (1.2)	3.5 (1.5)	-1.77 (.08)
DERS	103.8 (27.4)	103.3 (23.9)	103.9 (28.1)	0.11 (.91)

Note. [a]High school: 12-13 years of schooling, according to the German school system; [b]Secondary school: 9-10 years of schooling, according to the German school system; with partner = with partner and/or child(ren) in own apartment; with parents = with parents/one parent; previous treatment = previous psychological treatment (inpatient and/or outpatient);

comorbid PD = comorbid personality disorder; number of CD = number of comorbid disorders; *M, SD,* and *t* values for the clinical measures were calculated on the imputed dataset, [1]*n* = 195, [2]*n* = 187, [3]*n* = 188, [4]*n* = 189, [5]*n* = 181, [6]*n* = 175, [7]*n* = 167, [8]*n* = 146, [9]*n* = 143

Dropout in trauma focused-treatment for PTSD

A total of 30 out of 195 patients (15.38%) were classified as dropouts according to our criteria.

Analysis of dropout prediction

Association between dropout and predictor variables

Point-biserial correlations were calculated on the imputed dataset to examine the zero-order associations between dropout and the predictor variables. Results revealed a significant positive correlation between dropout and age (r = -.19, p = .02) but not between dropout and any other variable. See Appendix Table B1.1 for a complete correlation matrix of all variables studied.

Prediction of dropout

To examine the unique influence of the variables of interest on dropout (0 = no dropout, 1 = dropout), a multiple logistic regression was performed on the imputed data. The results indicated that age (β = - 0.07, p = .04) and living situation (β = -2.16, p = .04) were significant predictors of dropout (see Table 3.2). Results showed that younger individuals were more likely to drop out of treatment, with an *OR* of 0.94. Patients who lived with their parents were at lower risk of dropout compared to those who lived alone (*OR* = 0.12).

Table 3.2

Results of the Logistic Regression Analysis

Variable	β	SE	t	OR	lower CI	upper CI	p
Intercept	-0.46	2.13	-0.22	0.63	0.01	47.3	.82
Gender (Ref. = female)	0.87	0.65	1.34	2.39	0.67	8.59	.18
Age	-0.07	0.03	-2.12	0.94	0.88	1.00	.04
Marital status							
(Ref. = single)							
Married	-0.33	0.67	-0.49	0.72	0.19	2.73	.63
Divorced/widowed	0.35	0.91	0.39	1.42	0.23	8.79	.70
Living situation							
(Ref. = alone)							
With partner	-0.11	0.68	-0.17	0.89	0.23	3.42	.87
With parents	-2.16	1.02	-2.11	0.12	0.02	0.88	.04
Other	0.05	0.83	0.06	1.05	0.20	5.41	.95
Highest education level							
(Ref. = uni. degree)							
High school	1.12	0.83	1.35	3.07	0.59	15.90	.18
Secondary school	0.45	0.79	0.57	1.57	0.33	7.43	.57
Other	0.99	1.10	0.90	2.68	0.31	23.41	.37
Previous treatment	-0.39	0.54	-0.73	0.68	0.23	1.97	.47
(Ref. = no)							
Comorbid PD	0.92	0.93	0.99	2.52	0.39	16.30	.33
(Ref. = yes)							
Number of CD	0.03	0.31	0.08	1.03	0.52	2.02	.93
Gender match	-0.20	0.62	-0.33	0.82	0.24	2.80	.74
(Ref. = match)							
Approval therapist	-0.02	0.51	-0.05	0.98	0.36	2.66	.96
(Ref. = licensed)							
PCL-5	-0.01	0.02	-0.34	0.99	0.95	1.04	.73
CTQ-28	-0.01	0.01.	-0.81	0.99	0.96	1.02	.41
IIP-32	0.02	0.58	0.04	1.02	0.32	3.26	.97
DES	-0.04	0.19	-0.22	0.96	0.66	1.40	.83
PTCI	0.01	0.01	0.66	1.01	0.99	1.03	.51
IPSI	0.47	0.27	1.72	1.60	0.93	2.76	.09
DERS	-0.02	0.02	-1.12	0.98	0.95	1.01	.26

Note. Ref. = reference category; with partner = with partner and/or child(ren) in own apartment; with parents = with parents/one parent; uni. degree = university degree; previous treatment = previous psychological treatment (inpatient and/or outpatient); comorbid PD = comorbid personality disorder; number of CD = number of comorbid disorders; OR = Odds ratio; lower and upper CI refer to the corresponding 95% confidence intervals of the OR

Prediction performance

Using leave-one-out cross-validation on the imputed datasets, we evaluated the prediction performance of the logistic regression model in distinguishing between people who dropped out vs. those who did not dropout from the treatment. The model showed an accuracy of 80.5%. This accuracy score should be interpreted carefully as the data was not balanced between dropout (15.38%) and no dropout (84.62%). Indeed, the specificity was excellent (95.2%) although the sensitivity was poor (3.3%), meaning that the model is not good at identifying dropouts. ROC analysis showed an AUC value of 0.58, indicating the marginal discriminatory power of the logistic regression model.

Discussion

The first aim of the present study was to investigate the frequency of dropout in trauma-focused, guideline-recommended interventions for PTSD in routine clinical care. 15.38% of patients unilaterally decided to prematurely terminate a started PTSD treatment. The dropout rate found in our study was considerably lower than previous estimates in routine clinical care. This applies for a sample of veterans (e.g., 36%, Goetter et al., 2015), as well as for a joint consideration of trauma-focused treatments for PTSD in RCTs and non-RCTs (e.g., 41.5%, Mitchell et al., 2022). The present findings are further accentuated by the fact that the estimated dropout rate is comparable or even slightly lower than mean dropout rates reported in meta-analysis of highly standardized RCTs, e.g., 16% for a wide range of PTSD treatments (Lewis et al., 2020) and 20.9% from guideline-recommended PTSD treatment (Varker et al., 2021). This finding on the low dropout rate is of particular importance as in clinical practice it is a major therapeutic goal to develop not only effective but also acceptable and feasible treatments. A number of possible explanations for the low dropout rate in our study are conceivable. First treatment was delivered in a university-based outpatient centers which provide a well-structured treatment approach along with close supervision, while also allowing for some flexibility in treatment provision. Thus, it could be argued that the present setting combines the strengths of

both, RCTs and a naturalistic setting. Note, however, that in RCTs across disorders higher dropout rates were found in university-based institutions (Swift & Greenberg, 2012). Second, therapists in training might invest more time and effort to tailor treatment to their patients' needs than it is usually observed in regular care. Third, the TF-CBT provided as treatment might be especially feasible for the studied sample. Forth, we used well defined criteria to operationalize dropout (therapist decision combined with patient-initiated dropout).

The second aim of the study was to investigate predictors of dropout in trauma-focused, guideline-recommended interventions for PTSD in routine clinical care. A multiple logistic regression revealed age and living situation to be significant predictors, with higher risk of dropout in younger individuals and lower risk of dropout in patients who lived with their parents as opposed to living alone. The finding of younger age being predictive for dropout adds to previous findings on predictors of dropout in the general and PTSD-specific literature (Goetter et al., 2015; Swift & Greenberg, 2012), with only few studies not replicating these findings (e.g., Varker et al., 2021). Note, that all patients in the study were adults (between 18 and 65 years). Possible explanations include the fact that young patients may have more competing time demands (Goetter et al., 2015), treatment may not sufficiently match their needs, or young patients may face a lack of stability in their living environments (de Soet et al., 2023). In addition, it is conceivable that young adults have not yet experienced that PTSD symptoms in most cases do not simply disappear on their own over time (Morina et al., 2014).

To our knowledge, no previous study has investigated the influence of living situation on premature termination of treatment. Note that although patients living with their parents probably tend to be younger, the significant findings on lower risk of dropout in patients who lived with their parents compared to living alone had a unique effect, i.e., when controlling for the influence of age. To explain our findings, it appears important to address the influence of parental support on treatment outcomes. In their review of dropout in adolescents, de Soet et al. (2023) showed that parental approval, participation, and support were associated with lower

risk of dropout. Therefore, young patients living with their parents might perceive more parental support and thus dropout becomes less likely than if these patients were living alone. However, more research is needed to understand the influence of living situation on premature termination of treatment.

We also examined the possible role of several clinical variables as predictors of dropout. Results showed that baseline symptom levels and associated clinical variables were overall not predictive of dropout. This is in line with earlier findings (mostly based on data collected using RCT designs) showing that e.g., symptom severity (Varker et al., 2021) or comorbidity (Mitchell et al., 2022; Snoek et al., 2021; Varker et al., 2021) were not predictive of dropout. A notable exception is a study by Mitchell et al. (2022), which did find higher PTSD symptom severity at baseline predicted dropout; however, this was only the case for clinician-rated PTSD severity and not for self-rated PTSD scores. Thus, the role of baseline PTSD symptom severity on dropout needs to be examined in further research focused on a possible role of methodological variables.

Although it was not the primary focus of the current study, we additionally tested how well the logistic regression model would predict dropout. Taking the given imbalance between dropout and no dropout into account, the model comprising different pretreatment variables was not successful in predicting whether a patient who just started treatment would dropout during the course of treatment. Our results are in line with Vöhringer et al. (2020) who reported poor results on the discriminative power of pretreatment variables to distinguish between dropouts and completers.

In sum, only very few variables assessed in the current study were significant predictors of dropout, and the overall model could not predict dropout to a practically useful level. This is broadly in line with the majority of earlier findings. Thus, therapists and researchers should be cautious about making confident predictions about retention based on baseline data.

Limitations

This study has a number of important strengths. One major strength is the naturalistic setting of the study, which allows for flexibility and variance in the trauma-focused, guideline-recommended treatment provided. In addition, the naturalistic setting contributes significantly to an increase in external validity and generalizability of the results to clinical practice. Nevertheless, there are a number of noteworthy limitations. First, the number of participants included in the analysis was limited, potentially leading to reduced statistical power. Second, treatments were not standardized but allowed for some flexibility based on a manual delineating key treatment principles. This can be regarded as a strength of the study. However, we cannot rule out the possibility that the variability in the composition and timing of the use of different treatment modules may have obscured effects of certain variables in predicting dropout, as therapists may have counter-acted these variables in treatment. Third, results could be limited by the method used to operationalize dropout. Last, the uncontrolled study design again is both a strength and a limitation, as it prevents drawing clear conclusions from the results. It remains unclear whether confounding variables that cannot be controlled have an influence on the occurrence of dropout.

Conclusion and Future Directions

In conclusion, this study provides important knowledge about the dropout rate and predictors of dropout in trauma-focused, guideline-recommended interventions for PTSD in routine clinical care. Results show that the dropout rate in this naturalistic study was comparable to dropout rates found in RCTs. In addition, two baseline predictors of dropout were identified, suggesting that young adults with PTSD may need close, supportive care, especially when they are no longer living with their parents. Therapists can act as supportive guides, build and strengthen hope (Swift & Greenberg, 2012), and be aware of urgent crises and the social needs of their young patients.

Possibly most importantly, however, our findings replicate earlier results showing that identifying patients at risk of dropping out of treatment early-on by baseline variables is challenging and currently not possible at a practically useful level. A number of implications can be drawn from this finding. First, from an applied perspective, these findings contradict widespread clinical beliefs about trauma-focused interventions being less acceptable to patients with high symptom severities, high comorbidity, or complex symptom presentations (e.g., emotion dysregulation, dissociation, interpersonal difficulties). Neither earlier research nor our current findings suggest that patients with these particularly severe and/or complex presentations are more likely to drop out of treatment. However, larger samples may provide more power and enable us to examine even a broader scope of potential predictor variables with modern machine learning approaches (see Taubitz et al., 2022). Second, the cumulated findings may suggest that it is necessary to look beyond pretreatment factors when predicting dropout and to additionally include variables investigating processes occurring in the course of treatment. For example, Zandberg et al. (2016) found that the rates of symptom change had a significant influence on dropout in patients with comorbid PTSD and alcohol dependence. Patients with low baseline symptom severity showed low risk for dropout in slow improvement and higher risk in fast improvement. When baseline symptom severity was high, the effect was u-shaped, with high risk of dropout in both slow and fast improvement (Zandberg et al., 2016). Finally, in order to understand reasons for dropout, it appears recommendable to systematically assess these subjective reasons from the patients' perspective (Vöhringer et al., 2020).

Expanding research into dropout from PTSD treatment in these ways appears highly relevant since dropout continues to be an important clinical challenge preventing a considerable subgroup of treatment-seeking PTSD sufferers from receiving effective treatment. A better understanding of predictors of – and ultimately causal factors involved in – dropout may ultimately help to develop preventive strategies to reduce dropout and keep patients with severe symptoms in effective treatment.

Disclosure statement

The authors report there are no competing interests to declare.

Data availability statement

The authors have no permission to share the data. The code is available upon reasonable request.

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References Publication III

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Stokes, J., Handelsman, L., Medrano, M., Desmond, D., & Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect*, *27*(2), 169–190. https://doi.org/10.1016/s0145-2134(02)00541-0

Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *The Journal of Nervous and Mental Disease*, *174*(12), 727–735. https://doi.org/10.1097/00005053-198612000-00004

Bhaskaran, K., & Smeeth, L. (2014). What is the difference between missing completely at random and missing at random? *International Journal of Epidemiology*, *43*(4), 1336–1339. https://doi.org/10.1093/ije/dyu080

Bryant, R. A., Moulds, M. L., Mastrodomenico, J., Hopwood, S., Felmingham, K., & Nixon, R. D. V. (2007). Who drops out of treatment for post-traumatic stress disorder? *Clinical Psychologist*, *11*, 13–15. https://doi.org/10.1080/13284200601178128

De Soet, R., Vermeiren, R. R. J. M., Bansema, C. H., van Ewijk, H., Nijland, L., & Nooteboom, L. A. (2023). Drop-out and ineffective treatment in youth with severe and enduring mental health problems: a systematic review. *European Child & Adolescent Psychiatry*. https://doi.org/10.1007/s00787-023-02182-z

Dunmore, E., Clark, D. M., & Ehlers, A. (1999). Cognitive factors involved in the onset and maintenance of posttraumatic stress disorder (PTSD) after physical or sexual assault. *Behaviour Research and Therapy*, *37*(9), 809–829. https://doi.org/10.1016/s0005-7967(98)00181-8

Ehlers, A. (1999). *Posttraumatische Belastungsstörung* [Posttraumatic Stress Disorder]. Hogrefe.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319–345. https://doi.org/10.1016/s0005-7967(99)00123-0

First, M. B., Williams, J. B. W., Karg, R. S., & Spitzer, R. L. (2016). *Structured Clinical Interview for DSM-5 Disorders-Clinician Version*. Hogrefe.

First, M. B., Williams, J. B. W., Smith Benjamin, L., & Spitzer, R. L. (2016). *Structured Clinical Interview for DSM-5 - Personality Disorders*. Hogrefe.

Foa, E. B., Ehlers, A., Clark, D. M., Tolin, D. F., & Orsillo, S. M. (1999). The Posttraumatic Cognitions Inventory (PTCI): Development and validation. *Psychological Assessment*, *11*(3), 303–314. https://doi.org/10.1037/1040-3590.11.3.303

Goetter, E. M., Bui, E., Ojserkis, R. A., Zakarian, R. J., Brendel, R. W., & Simon, N. M. (2015). A Systematic Review of Dropout From Psychotherapy for Posttraumatic Stress Disorder Among Iraq and Afghanistan Combat Veterans. *Journal of Traumatic Stress*, *28*(5), 401–409. https://doi.org/10.1002/jts.22038

Gratz, K. L., & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment*, *26*(1), 41–54. https://doi.org/10.1023/B:JOBA.0000007455.08539.94

Horowitz, L., Alden, L., Wiggins, J., & Pincus, A. (2000). Inventory of interpersonal problems (IIP-32/IIP-64). *London: Psychological Corporation*.

Kropko, J., Goodrich, B., Gelman, A., & Hill, J. (2014). Multiple Imputation for Continuous and Categorical Data: Comparing Joint Multivariate Normal and Conditional Approaches. *Political Analysis*, *22*(4), 497–519. http://www.jstor.org/stable/24573085

Krüger-Gottschalk, A., Alpers, G., Pittig, A., Kuck, S., Dyer, A., & Ehring, T. (in preparation): Effectiveness of phase-based trauma-focused cognitive behavioural therapy in a routine clinical setting [Unpublished manuscript]. Institute of Psychology, University of Muenster.

Leichsenring, F. (2004). Randomized controlled versus naturalistic studies: A new research agenda. *Bulletin of the Menninger Clinic*, *68*(2), 137–151. https://doi.org/10.1521/bumc.68.2.137.35952

Lewis, C., Roberts, N. P., Gibson, S., & Bisson, J. I. (2020). Dropout from psychological therapies for post-traumatic stress disorder (PTSD) in adults: systematic review and meta-analysis. *European Journal of Psychotraumatology*, *11*(1), 1709709. https://doi.org/10.1080/20008198.2019.1709709

Mavranezouli, I., Megnin-Viggars, O., Daly, C., Dias, S., Welton, N. J., Stockton, S., Bhutani, G., Grey, N., Leach, J., Greenberg, N., Katona, C., El-Leithy, S., & Pilling, S. (2020). Psychological treatments for post-traumatic stress disorder in adults: a network meta-analysis. *Psychological Medicine*, *50*(4), 542–555. https://doi.org/10.1017/S0033291720000070

Miles, S. R., & Thompson, K. E. (2016). Childhood trauma and posttraumatic stress disorder in a real-world Veterans Affairs clinic: Examining treatment preferences and dropout. *Psychological Trauma : Theory, Research, Practice and Policy*, *8*(4), 464–467. https://doi.org/10.1037/tra0000132

Mitchell, S., Mitchell, R., Shannon, C., Dorahy, M., & Hanna, D. (2022). Effects of baseline

psychological symptom severity on dropout from trauma-focused cognitive behavior therapy for posttraumatic stress disorder: A meta-analysis. *Traumatology*. *29*(2), 112–124. https://doi.org/10.1037/trm0000404

Morina, N., Wicherts, J. M., Lobbrecht, J., & Priebe, S. (2014). Remission from post-traumatic stress disorder in adults: A systematic review and meta-analysis of long term outcome studies. *Clinical Psychology Review*, *34*(3), 249–255. https://doi.org/10.1016/j.cpr.2014.03.002

Rubin, D. B. (1976). Inference and missing data. *Biometrika*, *63*(3), 581–592.

Schumm, H., Krüger-Gottschalk, A., Dyer, A., Pittig, A., Cludius, B., Takano, K., Alpers, G. W., & Ehring, T. (2022). Mechanisms of Change in Trauma-Focused Treatment for PTSD: The Role of Rumination. *Behaviour Research and Therapy*, *148*, 104009. https://doi.org/10.1016/j.brat.2021.104009

Schumm H., Krüger-Gottschalk A., Ehring T., Dyer A., Pittig A., Takano K., Alpers G.W., Cludius B. (2023). Do changes in dysfunctional posttraumatic cognitions differentially predict PTSD symptom clusters? *Journal of Consulting and Clinical Psychology*, *91*(7):438-444. https://doi.org/10.1037/ccp0000817

Shnaider, P., Boyd, J. E., Cameron, D. H., & McCabe, R. E. (2022). The relationship between emotion regulation difficulties and PTSD outcomes during group cognitive processing therapy for PTSD. *Psychological Services*, *19*(4), 751–759. https://doi.org/10.1037/ser0000546

Snoek, A., Nederstigt, J., Ciharova, M., Sijbrandij, M., Lok, A., Cuijpers, P., & Thomaes, K. (2021). Impact of comorbid personality disorders on psychotherapy for post-traumatic stress disorder: systematic review and meta-analysis. *European Journal of Psychotraumatology*, *12*(1), 1929753. https://doi.org/10.1080/20008198.2021.1929753

Steindl, S. R., Young, R. M., Creamer, M., & Crompton, D. (2003). Hazardous alcohol use and treatment outcome in male combat veterans with posttraumatic stress disorder. *Journal of Traumatic Stress*, *16*(1), 27–34. https://doi.org/10.1023/A:1022055110238

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *Journal of Consulting and Clinical Psychology*, *80*(4), 547–559. https://doi.org/10.1037/a0028226

Taubitz, F.-S., Büdenbender, B., & Alpers, G. W. (2022). What the future holds: Machine learning to predict success in psychotherapy. *Behaviour Research and Therapy*, *156*, 104116. https://doi.org/10.1016/j.brat.2022.104116

Van Buuren, S., & Groothuis-Oudshoorn, K. (2011). mice: Multivariate Imputation by Chained Equations in R. *Journal of Statistical Software*, *45*(3), 1–67. https://doi.org/gbw279

Van Minnen, A., Arntz, A., & Keijsers, G. P. J. (2002). Prolonged exposure in patients with chronic PTSD: predictors of treatment outcome and dropout. *Behaviour Research and Therapy*, *40*(4), 439–457. https://doi.org/10.1016/s0005-7967(01)00024-9

Varker, T., Jones, K. A., Arjmand, H.-A., Hinton, M., Hiles, S. A., Freijah, I., Forbes, D., Kartal, D., Phelps, A., Bryant, R. A., McFarlane, A., Hopwood, M., & O'Donnell, M. (2021). Dropout from guideline-recommended psychological treatments for posttraumatic stress disorder: A systematic review and meta-analysis. *Journal of Affective Disorders Reports*, *4*, 100093. https://doi.org/https://doi.org/10.1016/j.jadr.2021.100093

Vöhringer, M., Knaevelsrud, C., Wagner, B., Slotta, M., Schmidt, A., Stammel, N., & Böttche, M. (2020). Should I stay or must I go? Predictors of dropout in an internet-based psychotherapy programme for posttraumatic stress disorder in Arabic. *European Journal of Psychotraumatology*, *11*(1), 1706297. https://doi.org/10.1080/20008198.2019.1706297

Weathers, F. W., Blake, D., Schnurr, P., Kaloupek, D., Marx, B., & Keane, T. (2013). *The clinician-administered PTSD scale for DSM-5 (CAPS-5).* Retrieved from https://www.ptsd.va.gov/professional/assessment/adult-int/caps.asp

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). *The PTSD checklist for DSM-5 (PCL-5).* Scale available from the National Center for PTSD at www.ptsd.va.gov.

Zandberg, L. J., Rosenfield, D., Alpert, E., McLean, C. P., & Foa, E. B. (2016). Predictors of dropout in concurrent treatment of posttraumatic stress disorder and alcohol dependence: Rate of improvement matters. *Behaviour Research and Therapy*, *80*, 1–9. https://doi.org/10.1016/j.brat.2016.02.005

Publication IV:

Prevalence and Predictors of Non-Response to Psychological Treatment for PTSD: A Meta-Analysis

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Depression and Anxiety

Prevalence and Predictors of Non-Response to Psychological Treatment for PTSD: A Meta-Analysis

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This study was registered in the International Prospective Register of Systematic Reviews (PROSPERO) (registration number: CRD42020179964). The data and R code can be found on OSF: https://osf.io/kvxbw/?view_only=9fb34187caff4c8a81549fc9ac197625

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Abstract

Background: Although highly efficacious psychological treatments for posttraumatic stress disorder (PTSD) exist, there is evidence that first-line psychological treatment approaches leave a substantial subgroup of patients still suffering from clinically relevant PTSD symptoms posttreatment.

Aims: We aimed to meta-analytically establish the prevalence and predictors of non-response to first-line guideline-recommended psychological treatments for PTSD.

Method: This meta-analysis was pre-registered (CRD42023368766). We searched the PTSD Trials Standardized Data Repository, Embase, Medline, PsychINFO, and PTSDpubs. We included randomized controlled trials (RCT), reporting data on non-response operationalized by (lack of) symptom reduction in PTSD symptoms at posttreatment of first-line guideline-recommended PTSD treatments for adult patients meeting criteria for a PTSD diagnosis. All studies published by October 10, 2023, were included. Data were extracted by two independent reviewers. We estimated the pooled average non-response rates and *OR*s. Subgroup and meta-regression analyses targeting the non-response rates served to identify significant predictors. All analyses were conducted using three-level multilevel models. Study quality was assessed using Cochrane's RoB 2 tool.

Results: 86 studies with 117 active treatment conditions, and 7,894 participants were included in the meta-analysis. The weighted average non-response rate was 39.23%, 95% CI [35.08%, 43.53%]. Non-response was less frequent in the treatment condition compared to the control condition (*OR* = 0.22). Subgroup analyses and meta-regression revealed type of analysis, population, type of intervention, treatment format, year of publication, age, gender, PTSD symptom severity, comorbid depression, and baseline depression score as significant

predictors. The heterogeneity between studies was substantial to considerable (I^2 = 83.12%). Half of the studies had a high risk of bias.

Conclusions: This meta-analysis found that a substantial subgroup of patients suffering from PTSD still showed clinically significant symptoms after having received treatment. Treatment modifications should be considered for specific subgroups of PTSD patients based on predictors found to be associated with non-response.

Keywords. PTSD; Meta-analysis; Non-Response, Treatment Outcome, Effectiveness

Introduction

In recent decades, highly efficacious psychological treatments for posttraumatic stress disorder (PTSD) have been developed, with trauma-focused interventions as first-line guideline-recommended treatments for PTSD.[1,2] However, researchers have recently raised serious concerns about methodological issues as well as reporting standards of PTSD trials.[3,4] Importantly, as effect sizes were typically reported on the group level, the number of trial participants not responding to treatment or even showing symptom worsening have been left largely unreported.[5,6] For instance, between 2010 and 2020, operational definitions for treatment non-response were provided in only in 60% of PTSD trials.[6] In addition, there is a lack of established guidelines in defining and documenting non-response and treatment failures in general.[6,7]

The treatment of PTSD presents unique challenges that can lead to negative treatment outcomes, such as non-response. In particular, complex post-traumatic symptom patterns, comorbid disorders, or various treatment-related or social factors can impede treatment success and lead to non-response to trauma-focused treatments.[8,9] Treatment non-response can lead to several severe consequences for the patients, the therapists, and the health care system in general. It has been associated with persistent functional impairment and a risk of future relapse for patients,[10] and a sense of uncertainty, rejection, and failure for therapists.[11,12] Non-response to treatment can also be a significant financial burden due to prolonged loss of productivity and ongoing healthcare costs.[13,14]

Despite the prevalence of non-response and its far-reaching consequences, there are currently no meta-analyses examining the prevalence and predictors of non-response to PTSD treatment. Current research suggests that evidence-based first-line psychological treatment approaches leave a substantial subgroup of PTSD patient still suffering from clinically relevant PTSD symptoms posttreatment.[6,15] Bradley et al[5] meta-analyzed 26 studies investigating

cognitive behavioral therapy (CBT) or eye movement desensitization and reprocessing (EMDR) and found that, across all treatments, 44% of included patients still met criteria for PTSD at posttreatment. Similarly, Schottenbauer et al[7] found a non-response rate of 50% across 55 reviewed studies, whereas Steenkamp et al[16] revealed even higher rates in military populations, ranging from 50 to 72%. Finally, a more recent meta-analysis across 28 studies on manualized first-line psychological treatment for PTSD found that 41% of participants still met criteria for PTSD at posttreatment, with military populations having higher rates of non-response (50%) than civilian populations (35%).[17].

Several variables have been discussed as predictors of non-response to PTSD treatment. Regarding demographic variables, older age and male gender have been associated with non-response, however findings remain inconsistent.[11,18,19] In addition, PTSD-specific variables, such as PTSD symptom severity, trauma type, and the presence of comorbid disorders, in particular depression, anxiety disorder, and substance use disorders, may influence treatment response. Besides patient variables, certain treatment characteristics may predict treatment non-response. Concerning the tolerability of trauma-focused treatment, Dewar et al.[18] reported higher non-response rates in studies investigating exposure therapy. However, comparative evidence on the influence of different types of trauma-focused treatment on non-response is still lacking. In addition, recent meta-analyses have found no effect of the number of treatment sessions on treatment outcome.[19,20] Further, current evidence suggests higher efficacy in individual treatment formats and emphasizes the importance of homework adherence for treatment outcomes in trauma-focused treatments.[21]

Comprehensive knowledge on the prevalence and predictors of non-response is crucial for clinicians' decisions on when to increase the treatment dose[22] or switch to a different treatment approach[23] as well as the development of add-on interventions that could be applied at earlier stages of the treatment.[8] However, there is a significant lack of research investigating

non-response from trauma-focused, guideline-recommended psychological treatments for PTSD.

Therefore, the first aim of this study was to determine the prevalence of non-response from first-line guideline-recommended psychological treatments for PTSD, while considering different operational definitions of the phenomenon. Our second aim was to identify treatment non-response predictors across studies, focusing on study-, patient-, outcome-, and therapist-related variables.

Method

The protocol was registered in PROSPERO (CRD42023368766), and the meta-analysis is reported according to Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA[24]) guideline (for PRISMA checklist, see Appendix C1., Table C1.1 and Table C1.2).

Identification and Selection of Studies

Inclusion criteria were (a) studies published in English; (b) studies published in a peer-reviewed journal; (c) randomized controlled trials (RCT); (d) studies with participants ≥ 16 years who (e) all met criteria for a PTSD diagnosis according to DSM-IV, DSM-5, or ICD-10 established with a structured clinical interview; (f) treatment under investigation was a first-line guideline-recommended PTSD treatment[25] and (g) consisted of at least two sessions; (h) data on (non-)response (either clinician- or self-report) in terms of change in PTSD symptoms were reported separately for each treatment condition, (i) post-assessments were conducted no later than 6 weeks after end of treatment. Studies focusing on patients with severe cognitive impairment, medication trials, placebo-controlled trials, and trials using virtual reality were excluded. These restrictions were applied to reduce the potential heterogeneity among the included studies. Samples with severe cognitive impairment were excluded due to their difficulties to meet the cognitive demands especially for trauma-focused guideline-recommended PTSD treatment, such as verbal memory or adapting maladaptive patterns.

Additionally, psychological treatments delivered exclusively in virtual reality were excluded due to the lack comparability to guideline-recommended treatments delivered in person. The literature search was conducted using the PTSD Trials Standardized Data Repository[26] (PTSD Repository) containing studies published before July 30, 2021.[27,28] The Repository was last updated[29] in the final phase of our work in September 2023, adding studies published before March 3, 2023. In addition, we conducted a database search in Embase, Medline, PsychINFO, and PTSDpubs, using an adapted version of the search string from the PTSD-Repository.[28] This was done in order to retrieve all studies published after July 30, 2021, respectively after March 3, 2023, as well as additional studies not reported in the Repository (see Appendix C2. for details on both search strategies). The current meta-analysis therefore includes all studies published to October 10, 2023.

To determine eligibility, studies were initially examined by two independent reviewers on a title and abstract level (L.K., C.L.), and then on a full text level (M.S., L.R.). Any discrepancies were resolved in the whole team.

Data Extraction

Data extraction was independently performed by two researchers (L.K., C.L.) using a pre-defined coding manual. Data extraction was started on January 15, 2023. The mean agreement rate was 99.04% (SD =1.1%; range: 94.00%-100%). The interrater reliability was calculated as the mean agreement rate across all study agreement scores. The agreement score per study represents the percentage of agreement across all coded items. Any discrepancies were discussed with all members of the team (L.K., C.L., M.S., L.R., T.E., V.S.) until a consensus could be reached. First, we extracted data on the number of non-responders at post-assessment for each condition. When results of multiple operationalizations of non-response were reported within a study, the operationalization with the highest rank in the following hierarchy was selected: (1) retention of PTSD diagnosis; (2) failure to achieve a predefined

symptom reduction (e.g., 10-points or a 30% reduction on the CAPS); (3) non-significant change according to a statistical formula (e.g., Jacobson and Truax´s[30] RCI or clinically significant change); (4) failure to achieve a predefined cut-off score (e.g., a total score of 20 or less on the CAPS) (for details, see Appendix C3). Secondly, we coded available data on study, sample, treatment, and therapist characteristics (see Appendix C3, Table C3.1 for a detailed list of moderators).

Quality Assessment

The risk of bias (RoB) was assessed using Cochrane's RoB 2 tool (for details see Appendix C10.).[31] The RoB rating was based on the rating provided in the PTSD Repository or, for studies not included in the Repository, an additional rating was performed. The assessment included an evaluation of different biases represented by five different domains: randomization process, deviation from intended intervention, missing outcome data, measurement of outcome, and selection of reported results. The overall RoB rating was derived from the ratings within each domain.

Statistical Analysis

Effect Sizes

The primary outcomes were the non-response rate and the *OR*. The non-response rate was defined as the proportion of the number of patients who did not respond in a condition out of the total number of patients in that condition. The non-response rate was computed separately for each included treatment condition. The *OR* was calculated as the relative non-response rate of a treatment condition compared to a control condition.

We used the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach to evaluate the quality of evidence.[32] The *summary of findings* table, generated by using the GRADEpro GDT software[33], provides an overview of the main findings,

including an assessment of their quality (see Appendix C9. for summary of findings). Note that the GRADE approach was developed to assess the quality of evidence regarding effect sizes derived from a comparison between treatments or against a control condition. Due to the specific research question of the current meta-analysis, some GRADE criteria could only be answered with limitations.[34]

Multilevel Model

We used multilevel models to estimate average non-response rates and *OR*s as log-transformed proportions or ratios. This was based on the assumption that the true effect size would vary between studies due to the variability between studies. In addition, three-level multilevel models were used due to the nested structure of the data (i.e., several active treatment conditions within a study). The three-level model provided a better fit, i.e., lower AIC and BIC, in comparison to the two-level model (without the study level), AIC = 290.24 versus 304.95, BIC = 298.50 versus 310.46. The R *metafor* package[35] was used to estimate all multilevel models using the restricted maximum likelihood (REML) estimation. Given the heterogeneity in operationalizations of non-response, we conducted an exploratory meta-analysis on a subgroup of studies that operationalized non-response as retention of PTSD diagnosis (see Appendix C4., with Table C4.1, Table C4.2, Figure C4.1, Figure C4.2).

Test of Homogeneity

Cochran's Q and I^2 statistics were used to examine heterogeneity in non-response rates and *OR*s. I^2 between 0%-40% was interpreted as *potentially not important*, 30-60% as *moderate*, 50%-75% as *substantial*, 75%-90% as *substantial to considerable*, and >90% as *considerable*.[36,37]

Subgroup and Meta-Regression Analyses

The subgroup and meta-regression analyses targeted only non-response rates, not *OR*s, as we aimed to identify specific predictors of non-response in the treatment conditions. For subgroup analyses, Q-statistics served as an omnibus test to identify significant categorical

predictors of non-response. Meta-regression analyses were conducted on continuous predictors (see Appendix C3, Table C3.1). Given the high heterogeneity in included studies, we conducted subgroup and meta-regression analyses separately for each predictor. We applied α-level corrections using the Benjamini-Hochberg procedure[38] to control for multiple statistical tests.

Results

Study Characteristics

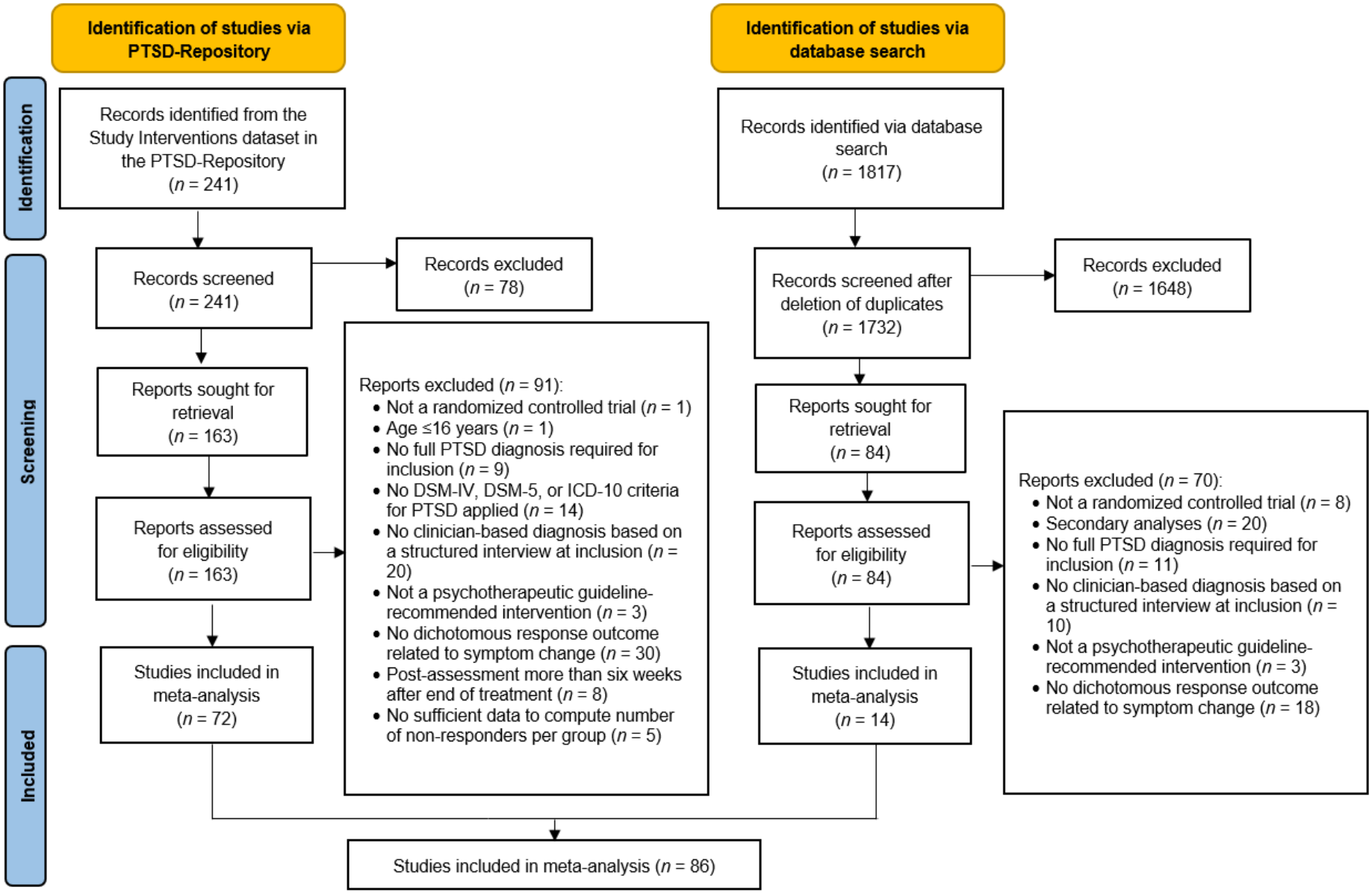
A total of 86 studies (k_s) reporting data of 117 active treatment conditions (k_t), and 7,894 participants were included in the meta-analysis (see Figure 4.1 for the PRISMA flow diagram and Appendix C5. and Appendix C6. for included and excluded studies). The majority of studies included were conducted in the US (k_s = 48) and used retention of PTSD diagnosis to operationalize non-response (k_s = 66). Treatment was mostly provided in an individual format (k_t = 104), and comprised on average 11.3 sessions (*SD* = 4.6), with k_t = 48 treatments delivered by trainee therapists. The weighted mean age of participants was 41.02 years (*SD* = 6.28) and on average 42.4% (*SD* = 34.0) of them were female. Most studies used the CAPS (CAPS-IV k_s = 44; CAPS-5 k_s = 13) for PTSD assessment. Comorbidity was reported in k_t = 67 studies, and 61.0% (*SD* = 15.8%) of participants suffered from comorbid depression (for characteristics of all included studies see Appendix C7.).

Non-Response Rate

The weighted average non-response rate across all studies in active treatment conditions was 39.23%, 95% CI [35.08%, 43.53%], ranging from 0%-85.71%. The heterogeneity between studies was rated as *substantial to considerable*, $Q(116) = 623.30$, $p < .0001$, $I^2 = 83.12\%$, 95% CI [81.17, 84.78] (see Figure 4.2). The pooled *OR* was 0.22, 95% CI [0.17, 0.26], indicating that non-response was less frequent in the treatment condition compared to the control condition. The heterogeneity was *substantial*[36], $Q(77) = 215.04$, $p < .0001$, $I^2 = 69.80\%$, 95% CI [63.74, 74.46] (see Appendix C8. for a forest plot).

Figure 4.1

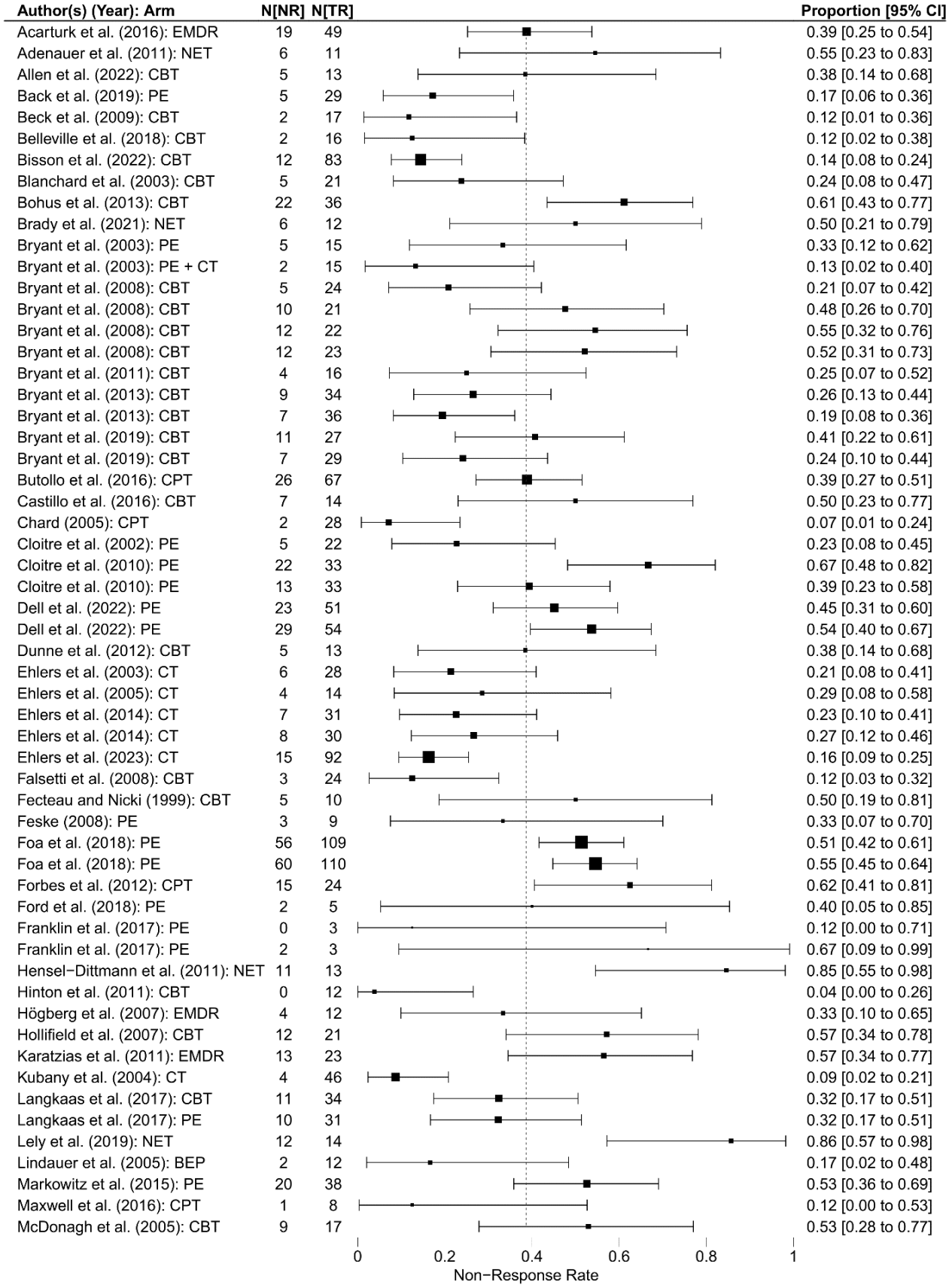
PRISMA Flow Diagram

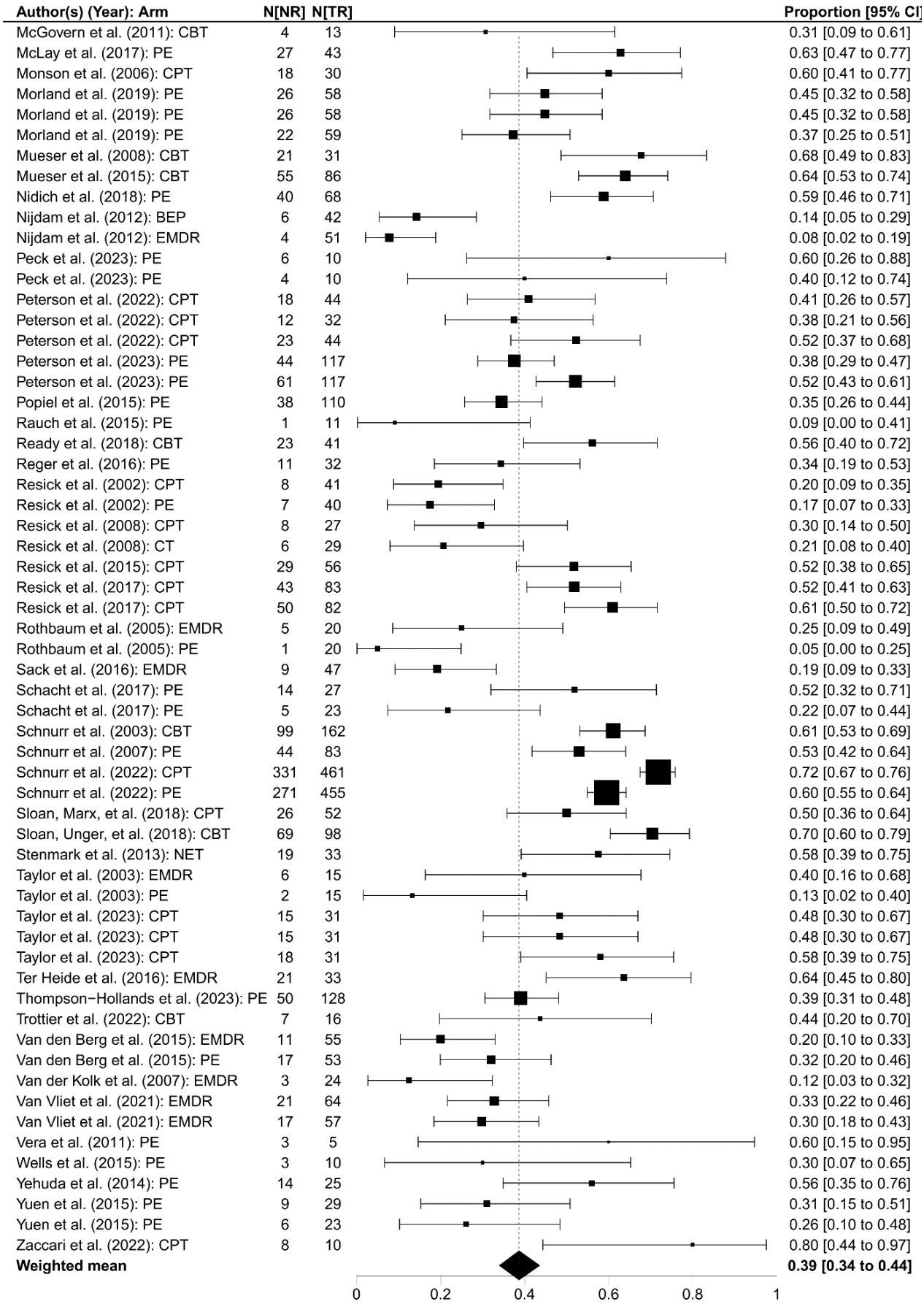


Note. *n* = number of studies; PTSD = posttraumatic stress disorder; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, fourth edition; DSM-5 = Diagnostic and Statistical Manual of Mental Disorders, fifth edition; ICD-10 = International Classification of Diseases, 10th revision. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analysis. Adapted from The PRISMA 2020 statement: an updated guideline for reporting systematic reviews, 2020.[24]

Figure 4.2

Forest Plot of Non-Response Rate




Author(s) (Year): Arm N[NR] N[TR] Proportion [95% CI]
McGovern et al. (2011): CBT 4 13 0.31 [0.09 to 0.61]
McLay et al. (2017): PE 27 43 0.63 [0.47 to 0.77]
Monson et al. (2006): CPT 18 30 0.60 [0.41 to 0.77]
Morland et al. (2019): PE 26 58 0.45 [0.32 to 0.58]
Morland et al. (2019): PE 26 58 0.45 [0.32 to 0.58]
Morland et al. (2019): PE 22 59 0.37 [0.25 to 0.51]
Mueser et al. (2008): CBT 21 31 0.68 [0.49 to 0.83]
Mueser et al. (2015): CBT 55 86 0.64 [0.53 to 0.74]
Nidich et al. (2018): PE 40 68 0.59 [0.46 to 0.71]
Nijdam et al. (2012): BEP 6 42 0.14 [0.05 to 0.29]
Nijdam et al. (2012): EMDR 4 51 0.08 [0.02 to 0.19]
Peck et al. (2023): PE 6 10 0.60 [0.26 to 0.88]
Peck et al. (2023): PE 4 10 0.40 [0.12 to 0.74]
Peterson et al. (2022): CPT 18 44 0.41 [0.26 to 0.57]
Peterson et al. (2022): CPT 12 32 0.38 [0.21 to 0.56]
Peterson et al. (2022): CPT 23 44 0.52 [0.37 to 0.68]
Peterson et al. (2023): PE 44 117 0.38 [0.29 to 0.47]
Peterson et al. (2023): PE 61 117 0.52 [0.43 to 0.61]
Popiel et al. (2015): PE 38 110 0.35 [0.26 to 0.44]
Rauch et al. (2015): PE 1 11 0.09 [0.00 to 0.41]
Ready et al. (2018): CBT 23 41 0.56 [0.40 to 0.72]
Reger et al. (2016): PE 11 32 0.34 [0.19 to 0.53]
Resick et al. (2002): CPT 8 41 0.20 [0.09 to 0.35]
Resick et al. (2002): PE 7 40 0.17 [0.07 to 0.33]
Resick et al. (2008): CPT 8 27 0.30 [0.14 to 0.50]
Resick et al. (2008): CT 6 29 0.21 [0.08 to 0.40]
Resick et al. (2015): CPT 29 56 0.52 [0.38 to 0.65]
Resick et al. (2017): CPT 43 83 0.52 [0.41 to 0.63]
Resick et al. (2017): CPT 50 82 0.61 [0.50 to 0.72]
Rothbaum et al. (2005): EMDR 5 20 0.25 [0.09 to 0.49]
Rothbaum et al. (2005): PE 1 20 0.05 [0.00 to 0.25]
Sack et al. (2016): EMDR 9 47 0.19 [0.09 to 0.33]
Schacht et al. (2017): PE 14 27 0.52 [0.32 to 0.71]
Schacht et al. (2017): PE 5 23 0.22 [0.07 to 0.44]
Schnurr et al. (2003): CBT 99 162 0.61 [0.53 to 0.69]
Schnurr et al. (2007): PE 44 83 0.53 [0.42 to 0.64]
Schnurr et al. (2022): CPT 331 461 0.72 [0.67 to 0.76]
Schnurr et al. (2022): PE 271 455 0.60 [0.55 to 0.64]
Sloan, Marx, et al. (2018): CPT 26 52 0.50 [0.36 to 0.64]
Sloan, Unger, et al. (2018): CBT 69 98 0.70 [0.60 to 0.79]
Stenmark et al. (2013): NET 19 33 0.58 [0.39 to 0.75]
Taylor et al. (2003): EMDR 6 15 0.40 [0.16 to 0.68]
Taylor et al. (2003): PE 2 15 0.13 [0.02 to 0.40]
Taylor et al. (2023): CPT 15 31 0.48 [0.30 to 0.67]
Taylor et al. (2023): CPT 15 31 0.48 [0.30 to 0.67]
Taylor et al. (2023): CPT 18 31 0.58 [0.39 to 0.75]
Ter Heide et al. (2016): EMDR 21 33 0.64 [0.45 to 0.80]
Thompson−Hollands et al. (2023): PE 50 128 0.39 [0.31 to 0.48]
Trottier et al. (2022): CBT 7 16 0.44 [0.20 to 0.70]
Van den Berg et al. (2015): EMDR 11 55 0.20 [0.10 to 0.33]
Van den Berg et al. (2015): PE 17 53 0.32 [0.20 to 0.46]
Van der Kolk et al. (2007): EMDR 3 24 0.12 [0.03 to 0.32]
Van Vliet et al. (2021): EMDR 21 64 0.33 [0.22 to 0.46]
Van Vliet et al. (2021): EMDR 17 57 0.30 [0.18 to 0.43]
Vera et al. (2011): PE 3 5 0.60 [0.15 to 0.95]
Wells et al. (2015): PE 3 10 0.30 [0.07 to 0.65]
Yehuda et al. (2014): PE 14 25 0.56 [0.35 to 0.76]
Yuen et al. (2015): PE 9 29 0.31 [0.15 to 0.51]
Yuen et al. (2015): PE 6 23 0.26 [0.10 to 0.48]
Zaccari et al. (2022): CPT 8 10 0.80 [0.44 to 0.97]
Weighted mean 0.39 [0.34 to 0.44]
0 0.2 0.4 0.6 0.8 1

Note. N[NR] = number of non-responders; N[TR] = number in treatment group; CI = confidence interval; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy. Square size indicates study weight. The zero frequency has been trimmed by adding a small constant for computation purposes.

Subgroup Analyses

The non-response rate was significantly predicted by the type of analysis, $Q(1) = 11.21$, $p < .001$, with lower non-response rates in studies reporting PP analysis (see Table 4.1). The study population also proved to be a significant predictor, $Q(3) = 29.73$, $p < .001$, with the lowest non-response rates coming from civilian samples. For treatment-related variables, we found the type of intervention to be predictive influence, $Q(7) = 28.54$, $p < .001$, with the lowest non-response rate for a combination of PE and CT and the highest rate for NET. Treatment format was a further predictor of non-response, $Q(2) = 7.90$, $p = .019$, with the lowest non-response for treatments combining individual and group treatment (see Table 4.1). Non-response rates were not related to country, in which the study was conducted, method used to operationalize non-response, time limit of treatment, homework, and therapist experience.

Table 4.1

Results from Subgroup Analyses on the Non-Response Rate

Moderator (k_t)	NR (%)	95% CI	*Q*	*p*	Adj. α
Study characteristics					
Country of study (117)			9.36	.589	.044
USA (66)	41.81	[36.21, 47.63]			
Australia (15)	38.54	[26.47, 52.20]			
Netherlands (9)	34.00	[20.95, 50.02]			
Germany (5)	48.09	[30.44, 66.23]			
Canada (5)	32.67	[16.49, 54.38]			
England (8)	23.94	[14.36, 37.14]			
Norway (4)	41.02	[21.53, 63.81]			
Poland (1)	34.55	[10.84, 69.61]			
Puerto Rico (1)	60.00	[13.29, 93.62]			
Scotland (1)	56.52	[20.19, 86.98]			
Thailand (1)	25.00	[5.17, 67.10]			
Turkey (1)	38.78	[12.10, 74.46]			
Type of analysis (117)			11.21	< .001**	.017
Per protocol (49)	31.06	[25.55, 37.16]			
Intention to treat (68)	44.90	[39.65, 50.26]			
Operationalisation of NR (117)			2.81	.422	.039
Retention of diagnosis (93)	37.45	[32.89, 42.24]			
Symptom reduction (12)	47.77	[35.41, 60.40]			
Non-significant change (9)	41.59	[27.52, 57.18]			
Non-achievement of cut-off (3)	46.85	[24.97, 70.01]			
Sample characteristics					
Population (117)			29.73	< .001**	.006
Civil (71)	31.42	[27.28, 35.87]			
Veterans & Military Personnel (40)	50.66	[44.35, 56.94]			
Refugee (5)	57.84	[41.60, 72.54]			
Mixed (1)	50.00	[21.76, 78.24]			
Treatment characteristics					
Type of intervention (117)			28.54	< .001**	.011
PE (41)	39.60	[33.88, 47.95]			
CBT (30)	40.73	[33.54, 47.99]			
CPT (19)	47.52	[39.50, 55.67]			
EMDR (12)	31.71	[23.48, 41.27]			
CT (7)	20.99	[13.01, 32.06]			
NET (5)	65.85	[47.68, 80.31]			
BEP (2)	24.82	[10.37, 48.52]			
PE + CT (1)	14.98	[3.00, 50.06]			
Treatment format (116)			7.90	.019*	.022
Individual (104)	38.28	[34.11, 42.63]			
Group (11)	49.13	[38.12, 60.23]			
Combined (1)	7.14	[1.06, 35.65]			
Time limit (115)			1.34	.247	.033
Low (≤ 12 sessions) (76)	37.94	[33.00, 43.14]			
High (> 12 sessions) (39)	42.99	[36.00, 50.27]			

Moderator (k_t)	NR (%)	95% CI	Q	p	Adj. α
Homework given (117)			0.07	.795	.05
Yes (77)	39.60	[34.58, 44.84]			
No (40)	38.47	[31.75 ,45.67]			
Therapist characteristics					
Therapist experience level (92)			6.05	.109	.028
Trainee (48)	37.29	[31.24, 43.77]			
Experienced (16)	27.42	[18.81, 38.11]			
Mixed (18)	43.18	[32.73, 54.27]			
No therapist (10)	46.47	[32.60, 60.90]			

Note. k_t = number of treatment conditions;

Q = Cochrane's Q;

CI = confidence interval; adj. α = adjusted α level after Benjamini–Hochberg approach; NR = non-response rate; symptom reduction = Non-achievement of predefined symptom reduction; Non-significant change = Non-significant change per statistical formula; Non-achievement of cut-off = Non-achievement of predefined cut-off score; PTSD = posttraumatic stress disorder; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy.

*Benjamini–Hochberg corrected $p < .05$. **Benjamini–Hochberg corrected $p < .01$.

Meta-Regression Analyses

Meta-regression analyses revealed a significant effect for the year of publication (p = .022), with higher non-response rates in more recently published studies (see Table 4.2). Furthermore, higher non-response rates were found in older samples (p = .002) and in samples with low percentage of female participants (p = .002). In addition, non-response was related to PTSD symptom severity (p = .012), such that higher non-response rates were associated with higher PTSD symptom severity at baseline. Further, the non-response rate was higher in studies with samples where a higher percentage of comorbid depression (p = .005) and higher baseline depression scores ($p < .001$). No association with non-response was found for marital status,

employment status, education level, anxiety score, number of sessions, duration of sessions or duration of treatment (see Table 4.2).

Table 4.2

Results from Meta-Regression Analyses on the Non-Response Rate (Log-Transformed)

Moderator (k_t)	β	95% CI	*p*	Adj. α
Study characteristics				
Year of study publication (117)	0.03	[0.01, 06]	.022*	.023
Sample characteristics				
Age (80)	0.05	[0.02, 0.07]	.002**	.008
Gender (85): % female	-0.87	[-1.43, -0.31]	.002**	.012
Marital (53): % committed relationship	0.97	[-0.12, 2.06]	.080	.027
Employment (42): % employed	-0.36	[-1.40, 0.67]	.492	.042
Education (40): % college-level	0.42	[-0.76, 1.60]	.485	.046
PTSD symptom severity score (88) [a]	0.24	[0.05, 0.43]	.012*	.019
Comorbid depression (40): % diagnosis	2.87	[0.88, 4.86]	.005**	.015
Depression score (87) [a]	0.39	[0.19, 0.59]	< .001**	.004
Anxiety score (48) [a]	0.21	[-0.07, 0.48]	.145	.031
Treatment characteristics				
Number of sessions (116)	0.02	[-0.01, 0.05]	.238	.035
Duration of session in minutes (103)	0.00	[-0.01, 0.01]	.438	.038
Duration of treatment in weeks (102)	0.01	[-0.02, 0.04]	.573	.05

Note. k_t = number of treatment conditions

CI = confidence interval, adj. α = adjusted α level after Benjamini–Hochberg approach, regression models were estimated separately for each predictor;

[a] *z*-standardized

*Benjamini-Hochberg corrected $p < .05$. **Benjamini-Hochberg corrected $p < .01$.

Risk of Bias

The overall risk of bias was rated as low for 11 studies (12.8%), 32 studies showed some concerns (37.2%), and the rating was high for 43 studies (50.0%) (for details see Appendix C10.).

Discussion

This is, to the best of our knowledge, the first comprehensive meta-analysis on the prevalence and predictors of non-response to the psychological treatment of PTSD. Across 86 studies investigating first-line guideline-recommended psychological PTSD interventions in a total of 117 active treatment arms, approximately 40% of patients were classified as non-responders, with a large range from 0% to 85.7%. The *OR* comparing active treatments with control conditions showed that active interventions considerably reduced the risk for non-response compared to control conditions. The prevalence of non-response to PTSD treatment found in our meta-analysis is comparable with previous meta-analytic results.[5,17] These findings show that although trauma-focused interventions in PTSD are highly efficacious, there is still considerable room for improvement as a substantial subgroup of patients does not respond to treatment.

We identified four groups of significant predictors of treatment non-response. First, some demographic and sample characteristics, namely male gender, older age, and being a refugee or a veteran, were found to be associated with higher non-response rates. These findings are in line with previous research, however, note that previous findings have been inconsistent in this regard.[11,18,39] Possible explanations for the associations with non-response include underlying mechanisms, such as reduced cognitive flexibility in older patients,[18] but could also partly be due to confounding variables, such as type of trauma.[5,40] In particular, combat-related trauma, which is more prevalent among men and refugees and veterans, has been associated with higher non-response rates in previous studies.[11] Therefore, future research is needed to examine underlying mechanisms and the unique effect of trauma type on non-response.

Second, two aspects of baseline psychopathology were found to be significant predictors of non-response, including high PTSD symptom severity. Further research is needed to replicate our findings regarding the potential impact of high PTSD symptom severity on treatment outcomes, as previous findings have been inconsistent.[18] Within these new approaches, it is

important to consider the potential underlying interference of reduced engagement due to high avoidance tendencies in patients with severe PTSD.[19,41]

In addition to PTSD severity, having a comorbid depressive disorder or elevated depressive symptoms at baseline was also found to be predictive of treatment non-response. It is conceivable that the reduced emotional activation prevalent in patients with depression may interfere with traumatic memory modification in trauma-focused PTSD treatment.[42,43] In addition, other possible mechanisms, such as rumination, avoidance, numbing, anhedonia, or diminished reward processing, may explain the interference of comorbid depression with trauma processing.[44–46] Therefore, more research is needed to identify possible mechanisms.

Third, certain treatment characteristics were predictive of non-response. Treatment type significantly predicted non-response, with the most frequently studied psychological interventions for PTSD, such as CBT, CPT, and PE all showing comparable non-response rates (CBT: 40.73%, CPT: 47.52%, PE: 39.60%), with slightly lower rates reported in EMDR studies (31.71%). The lowest non-response was found in studies combining PE and CT (14.98%) and the highest in studies evaluating NET (65.85%). These findings need to be treated with caution since we were able to include only one study with PE+CT and only five investigating NET. Furthermore, possible confounding variables (e.g., sample characteristics) cannot be ruled out, requiring closer investigation with a larger number of studies. It is important to note that our study focused on trauma-focused treatments. Therefore, besides replicating our findings on treatment type in a larger sample, future research should focus on comparing trauma-focused treatment with non-trauma focused approaches. In addition, we found the combination of individual and group therapy to have a considerably lower rate (7.14%) of non-response when compared to individual (38.28%) or group therapy (49.13%) alone. However, only one study investigated the combined treatment category. Therefore, future research is needed to determine, whether the findings can be replicated in a larger sample.

Fourth, we found that non-response was significantly higher in studies reporting ITT (44.90%) than PP (31.06%).[5] This was to be expected as higher rates of non-response are more likely to occur with patients who do not complete the whole course of treatment. Interestingly, the prevalence of non-response was not associated with the type of operationalizing non-response. This implies that the classification of a patient as (non-) responder was unlikely to change when applying different operationalizations. Nevertheless, future research is needed to more systematically compare different operationalization methods of non-response, e.g., using an individual patient data meta-analytic strategy. For future research, a combination of different criteria appears most informative. For example, when non-response is operationalized as retaining the diagnosis, patients with higher baseline symptom severities are more likely to be classified as non-responders at posttreatment, even in cases where they show the largest symptom reduction. Therefore, combining retention of diagnosis with indicators for magnitude of the treatment effect appears informative. Relatedly, it appears recommendable to include not only indicators of non-response regarding PTSD symptomology, but additionally functional outcomes and individual patient goals. Patients often perceive quality of life and functioning as more crucial and meaningful than symptom relief.[47] Recent research has shown that the best improvement of functional outcomes and quality of life can in fact be reached when patients are treated to remission.[48]

In addition to the implications for further research that can be derived directly from the findings of our study, it is important to consider additional factors that could influence treatment response in future research. In addition to cognitive factors, verbal memory could be investigated as a means of expanding the understanding of underlying mechanisms.[49] Additional variables of interest include social support,[50] physical health,[51] and other comorbid disorders such as sleep disorders,[52] alcohol and substance use disorder,[53,54] and borderline personality disorder.[55]

Our findings have potentially important implications for clinical practice. To increase treatment efficacy, it seems necessary to modify first-line guideline-recommended treatment approaches for different subgroups of PTSD patients, characterized by one or more of the identified baseline predictor variables.[25,56] Extending treatment for a longer period of time has previously been discussed as a promising approach for patients being at higher risk for non-response due to the high PTSD symptom severity.[57,58] This approach is often implemented in routine clinical practice.[25] However, our analysis did not find therapy dose (e.g., number of sessions, treatment duration, session duration) to be a significant predictor of non-response. Therefore, additional measures should be considered, including starting treatment immediately without considerable waiting time,[59] or offering a higher session frequency early-on.[60,61] In addition, our findings suggest the importance of considering comorbidity, particularly comorbid depression, in PTSD treatment. Although evidence shows that depressive symptoms improve with successful PTSD treatment[62], our results suggest that high levels of depressive symptoms may need more attention in treatment planning. Specifically, targeting excessively high depressive symptoms before engaging in trauma-focused interventions may be recommendable.[56] Further, adjuvant and second-line therapies may offer an alternative for patients at high risk of non-response.[8] These include novel psychotherapeutic approaches, such as Imaginal Rehearsal Therapy, as well as pharmacological interventions or neuromodulatory approaches.[8,63]

Strengths and Limitations

Our meta-analysis had several strengths. We applied strict inclusion criteria, e.g., exclusively focusing on RCTs investigating first-line evidence-based guideline-recommended psychological interventions. Furthermore, patients were diagnosed with PTSD using structured clinician-administrated interviews to minimize sample heterogeneity. In addition, a large number of studies were included, enhancing the reliability and generalizability of our findings.

Finally, the inter-rater reliability was very high at all stages of study selection and coding. A number of limitations are noteworthy. Firstly, the operationalization of predictors varied widely between studies. This forced us to test variables separately, as simultaneously entering multiple predictors into a meta-regression model would have reduced the number of studies in the analysis. Secondly, some potentially important predictors, such as number of trauma-focused sessions,[64] duration of exposure periods,[8] and therapeutic alliance,[65] could not be coded due to lack of data in these categories. Thirdly, none of the studies investigated complex PTSD (cPTSD) as defined by ICD-11.[66] Since it is estimated that around 30 to 50% of PTSD patients fulfill criteria for cPTSD,[67,68] the samples included in the current analysis most likely also included certain numbers of cPTSD patients. Future research should focus on non-response with respect to cPTSD since childhood-onset of trauma has been found to be reliably associated with both cPTSD and poorer treatment outcomes.[69]

Conclusions

In this comprehensive meta-analysis, we found that a substantial subgroup of patients suffering from PTSD still showed clinically significant symptoms after having received a first-line guideline-recommended treatment for PTSD. Thus, although these interventions are very efficacious on the group level, a considerable number of patients do not sufficiently benefit. Investigating predictors of non-response may help to understand and prevent these high rates. In our meta-analysis, males, older individuals, veterans and refugees were at greater risk of treatment non-response. Furthermore, symptom severity at baseline, specifically higher PTSD symptom severity as well as comorbid depression, was associated with non-response. In addition, certain treatment characteristics were found to be predictive of non-response, namely treatment type and treatment format. Future research is needed to replicate our findings, identify underlying mechanisms and potential confounding variables, and examine the influence of additional predictor variables on non-response. In conclusion, our findings have important

implications for clinical practice. To reduce non-response, it seems necessary to modify guideline-recommended treatment approaches for patients at high risk of non-response based on identified baseline predictors. Additionally, second-line treatment options may be advisable for this specific subgroup of patients.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Appendix

Additional information can be found in the Appendix.

Contributors

VS, TE, and MS conceived the study. VS, TE, and MS designed the project and preregistered the study. LK, CL conducted the literature search in the PTSD Repository. VS conducted the database search. LK and CL independently examined studies for inclusion on a title and abstract level and LR and MS examined studies on a full text level. LK and CL independently performed the data extraction. Discrepancies were discussed among VS, CL, LK, LR, TE, MS. VS performed the analysis. CL assisted in the analysis. CL performed the analysis of the risk of bias assessment. VS and MS wrote the draft of the manuscript. All authors (VS, CL, LK, LR, TE, MS) critically revised the manuscript. All authors had full access to all the data in the study. All authors approved the final version of the manuscript. All authors had final responsibility for the decision to submit the manuscript for publication.

Data and Analytic Code Availability

All presented data are publicly accessible. The data and analytic code that support the findings of this study are openly available on OSF: https://osf.io/kvxbw/?view_only=9fb34187caff4c8a81549fc9ac197625. Data will be made available immediately following publication with no end date. There are no access limits.

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References Publication IV

1. Courtois CA, Sonis JH, Brown LS, et al. Summary of the clinical practice guideline for the treatment of posttraumatic stress disorder (PTSD) in adults. *Am Psychol*. 2019;**74**(5):596-607. Available from: https://doi.org/10.1037/amp0000473
2. Martin A, Naunton M, Kosari S, Peterson G, Thomas J, Christenson JK. Treatment Guidelines for PTSD: A Systematic Review. *J Clin Med*. 2021;**10**(18). Available from: https://doi.org/10.3390/jcm10184175
3. Yehuda R, Hoge CW. The Meaning of Evidence-Based Treatments for Veterans With Posttraumatic Stress Disorder. *JAMA psychiatry*. 2016;**73**(5):433-434. Available from: https://doi.org/10.1001/jamapsychiatry.2015.2878
4. Scott J, Young AH. Psychotherapies should be assessed for both benefit and harm. *Br J Psychiatry* 2016; **208**: 208– 209. Available from: https://doi.org/10.1192/bjp.bp.115.169060.
5. Bradley R, Greene J, Russ E, Dutra L, Westen D. A Multidimensional Meta-Analysis of Psychotherapy for PTSD. *Am J Psychiatry*. 2005;**162**(2):214-227. Available from: https://doi.org/10.1176/appi.ajp.162.2.214.
6. Varker T, Kartal D, Watson L, et al. Defining response and nonresponse to posttraumatic stress disorder treatments: A systematic review. *Clin Psychol Sci Pract*. 2020;**27**(4). Available from: https://doi.org/10.1037/H0101781
7. Schottenbauer MA, Glass CR, Arnkoff DB, Tendick V, Gray SH. Nonresponse and dropout rates in outcome studies on PTSD: review and methodological considerations. *Psychiatry*. 2008;**71**(2):134-168. Available from: https://doi.org/10.1521/PSYC.2008.71.2.134
8. Burback L, Brémault-Phillips S, Nijdam MJ, McFarlane A, Vermetten E. Treatment of Posttraumatic Stress Disorder: a State-of-the-art Review. *Curr Neuropharmacol*. Published online April 2023. Available from: https://doi.org/10.2174/1570159X21666230428091433
9. Roberts NP, Lotzin A, Schäfer I. A systematic review and meta-analysis of psychological interventions for comorbid post-traumatic stress disorder and substance use disorder. *Eur J Psychotraumatol*. 2022;**13**(1):2041831. Available from: https://doi.org/10.1080/20008198.2022.2041831
10. Sutherland ME. Identifying treatment-resistant PTSD. *Nat Hum Behav*. 2019;**3**(6):549. Available from: https://doi.org/10.1038/s41562-019-0627-1
11. Fonzo GA, Federchenco V, Lara A. Predicting and Managing Treatment Non-

Response in Posttraumatic Stress Disorder. *Curr Treat options psychiatry*. 2020;**7**(2):70-87. Available from: https://doi.org/10.1007/s40501-020-00203-1

12. Ogrodniczuk JS, Joyce AS, Piper WE. Strategies for Reducing Patient-Initiated Premature Termination of Psychotherapy. *Harv Rev Psychiatry*. 2005;**13**(2):57-70. Available from: https://doi.org/10.1080/10673220590956429
13. Bonfils KA, Tennity CL, Congedo BA, Dolowich BA, Hammer LA, Haas GL. Functional outcomes from psychotherapy for people with posttraumatic stress disorder: A meta-analysis. *J Anxiety Disord*. 2022;**89**:102576. Available from: https://doi.org/10.1016/j.janxdis.2022.102576
14. Smith-Apeldoorn SY, Veraart JKE, Schoevers RA. Definition and Epidemiology of Treatment Resistance in Psychiatry BT - Treatment Resistance in Psychiatry: Risk Factors, Biology, and Management. In: Kim YK, ed. Springer Singapore; 2019:3-24. Available from: https://doi.org/10.1007/978-981-10-4358-1_1
15. Larsen SE, Fleming CJE, Resick PA. Residual symptoms following empirically supported treatment for PTSD. *Psychol Trauma*. 2019;**11**(2):207-215. Available from: https://doi.org/10.1037/tra0000384
16. Steenkamp MM, Litz BT, Hoge CW, Marmar CR. Psychotherapy for Military-Related PTSD: A Review of Randomized Clinical Trials. *JAMA*. 2015;**314**(5):489-500. Available from: https://doi.org/10.1001/jama.2015.8370
17. Straud CL, Siev J, Messer S, Zalta AK. Examining military population and trauma type as moderators of treatment outcome for first-line psychotherapies for PTSD: A meta-analysis. *J Anxiety Disord*. 2019;**67**:102133. Available from: https://doi.org/10.1016/j.janxdis.2019.102133
18. Dewar M, Paradis A, Fortin CA. Identifying Trajectories and Predictors of Response to Psychotherapy for Post-Traumatic Stress Disorder in Adults: A Systematic Review of Literature. *Can J Psychiatry*. 2020;**65**(2):71-86. Available from: https://doi.org/10.1177/0706743719875602
19. Barawi KS, Lewis C, Simon N, Bisson JI. A systematic review of factors associated with outcome of psychological treatments for post-traumatic stress disorder. *Eur J Psychotraumatol*. 2020;**11**(1):1774240. Available from: https://doi.org/10.1080/20008198.2020.1774240
20. McLean CP, Levy HC, Miller ML, Tolin DF. Exposure therapy for PTSD in military populations: A systematic review and meta-analysis of randomized clinical trials. *J Anxiety Disord*. 2022;**90**:102607. Available from:

https://doi.org/10.1016/j.janxdis.2022.102607

21. Cooper AA, Kline AC, Graham B, et al. Homework "Dose," Type, and Helpfulness as Predictors of Clinical Outcomes in Prolonged Exposure for PTSD. *Behav Ther*. 2017;**48**(2):182-194. Available from: https://doi.org/10.1016/j.beth.2016.02.013
22. Holder N, Shiner B, Li Y, et al. Determining the median effective dose of prolonged exposure therapy for veterans with posttraumatic stress disorder. *Behav Res Ther*. 2020;**135**:103756. Available from: https://doi.org/10.1016/j.brat.2020.103756
23. Sripada RK, Ready DJ, Ganoczy D, Astin MC, Rauch SAM. When to Change the Treatment Plan: An Analysis of Diminishing Returns in VA Patients Undergoing Prolonged Exposure and Cognitive Processing Therapy. *Behav Ther*. 2020;**51**(1):85-98. Available from: https://doi.org/10.1016/j.beth.2019.05.003
24. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;**372**:n71. Available from: https://doi.org/10.1136/bmj.n71
25. American Psychological Association. Clinical practice guideline for the treatment of posttraumatic stress disorder (PTSD) in adults. Published online 2017. Available from: https://www.apa.org/ptsd-guideline/ptsd.pdf
26. O'Neil ME, Harik JM, McDonagh MS, et al. Development of the PTSD-Repository: A Publicly Available Repository of Randomized Controlled Trials for Posttraumatic Stress Disorder. *J Trauma Stress*. 2020;**33**(4):410-419. Available from: https://doi.org/10.1002/jts.22520
27. O'Neil ME , Cheney TP, Hsu FC, Carlson KF, Hart EL, Holmes RS, et al. *Pharmacologic and Nonpharmacologic Treatments for Posttraumatic Stress Disorder: An Update of the PTSD-Repository Evidence Base*. Comparative Effectiveness Review No. 235. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 290-2015-00009-I.) AHRQ Publication No. 20(21)-EHC029. Rockville, MD: Agency for Healthcare Research and Quality; November 2020. Available from: https://doi.org/10.23970/AHRQEPCCER235.
28. O'Neil ME, Cheney TP, Yu Y, Hart EL, Holmes RS, Blazina I, et al. *Pharmacologic and Nonpharmacologic Treatments for Posttraumatic Stress Disorder: 2022 Update of the PTSD-Repository Evidence Base.* Systematic Review. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 75Q80120D00006.) AHRQ Publication No. 22(23)-EHC040. Rockville, MD: Agency for Healthcare Research and Quality; October 2022. Available from: https://

doi.org/10.23970/AHRQEPCPTSD2022

29. O'Neil ME, Cheney T, Yu Y, Hart EL, Holmes RS, Blazina I, et al. *Pharmacologic and Nonpharmacologic Treatments for Posttraumatic Stress Disorder: 2023 Update of the Evidence Base for the PTSD Trials Standardized Data Repository.* Systematic Review. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 75Q80120D00006.) AHRQ Publication No. 23-EHC028. Rockville, MD: Agency for Healthcare Research and Quality; September 2023. Available from: https://doi.org/10.23970/AHRQEPCPTSD2023.
30. Jacobson NS, Truax P. Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *J Consult Clin Psychol*. 1991;**59**(1):12-19. Available from: https://doi.org/10.1037/0022-006X.59.1.12
31. Sterne JAC, Savović J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ* 2019; **366**:14898. Available from: https://doi.org/10.1136/bmj.l4898.
32. Guyatt GH, Oxman AD, Vist GE, et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008;**336**(7650):924-926. Available from: https://doi.org/10.1136/bmj.39489.470347.AD
33. GRADE Working Group. McMaster University GRADEpro GDT (accessed 15 May 2017). Hamilton (ON): GRADE Work Group, McMaster University, 2015
34. Guyatt G, Oxman AD, Akl EA, et al. GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. *J Clin Epidemiol*. 2011;**64**(4):383-394. Available from: https://doi.org/10.1016/j.jclinepi.2010.04.026
35. Viechtbauer W. Conducting meta-analyses in R with the metafor package. *J Stat Softw* 2010; **36**: 1– 48. Available from: https://www.jstatsoft.org/v36/i03/.
36. Higgins JPT, Thomas J, Chandler J, et al. *Cochrane Handbook for Systematic Reviews of Interventions Version 6.2*. Cochrane, 2021.; 2021. (www.training.cochrane.org/handbook)
37. Semmlinger V, Takano K, Schumm H, Ehring T. Dropout from psychological interventions for refugees and asylum seekers: A meta-analysis. *J Consult Clin Psychol*. 2021;**89**(9):717-730. Available from: https://doi.org/10.1037/ccp0000681
38. Benjamini Y, Hochberg Y. Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *J R Stat Soc Ser B*. 1995;**57**(1):289-300. Available from: http://www.jstor.org/stable/2346101
39. Paiva J, Melani M, Gonçalves RM, et al. Predictors of response to cognitive-behavioral

therapy in patients with posttraumatic stress disorder: A systematic review. *J Bras Psiquiatr*. 2022;**71**(2):149-160. Available from: https://doi.org/10.1590/0047-2085000000375

40. Tolin DF, Foa EB. Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research. *Psychol Bull*. 2006;**132**(6):959-992. Available from: https://doi.org/10.1037/0033-2909.132.6.959
41. Pineles SL, Mostoufi SM, Ready CB, Street AE, Griffin MG, Resick PA. Trauma reactivity, avoidant coping, and PTSD symptoms: A moderating relationship? *J Abnorm Psychol*. 2011;**120**(1):240-246. Available from: https://doi.org/10.1037/a0022123
42. Angelakis S, Nixon RD V. The Comorbidity of PTSD and MDD: Implications for Clinical Practice and Future Research. *Behav Chang*. 2015;**32**(1):1-25. Available from: https://doi.org/10.1017/bec.2014.26
43. Jaycox LH, Foa EB, Morral AR. Influence of emotional engagement and habituation on exposure therapy for PTSD. *J Consult Clin Psychol*. 1998;**66**(1):185-192. Available from: https://doi.org/10.1037//0022-006x.66.1.185
44. Ehring T, Watkins ER. Repetitive negative thinking as a transdiagnostic process. *Int J Cogn Ther* 2008; **1**: 192–205. Available from: https://doi.org/10.1680/ijct.2008.1.3.192.
45. Nawijn L, van Zuiden M, Frijling JL, Koch SBJ, Veltman DJ, Olff M. Reward functioning in PTSD: a systematic review exploring the mechanisms underlying anhedonia. *Neurosci Biobehav Rev*. 2015;**51**:189-204. Available from: https://doi.org/10.1016/j.neubiorev.2015.01.019
46. Zoellner LA, Pruitt LD, Farach FJ, Jun JJ. Understanding heterogeneity in PTSD: Fear, dysphoria, and distress. *Depress Anxiety* 2014; **31**: 97–106. Available from: https://doi.org/10.1002/da.22133
47. Cuijpers P. Targets and outcomes of psychotherapies for mental disorders: an overview. *World Psychiatry* 2019; **18**: 276–285. Available from: https://doi.org/10.1002/wps.20661.
48. Hamrick L, Larsen SE, Sippel LM, Sherman K, Resick P, Galovski T. Benchmarking quality of life to posttraumatic stress disorder symptom changes in cognitive processing therapy. *J Anxiety Disord*. 2023;**93**:102647. Available from: https://doi.org/10.1016/j.janxdis.2022.102647
49. Nijdam M, Vries GJ, Gersons B, Olff M. Response to Psychotherapy for Posttraumatic

Stress Disorder: The Role of Pretreatment Verbal Memory Performance. *J Clin Psychiatry*. 2015;**76**:e1023-e1028. Available from: https://doi.org/10.4088/JCP.14m09438

50. Fletcher S, Elklit A, Shevlin M, Armour C. Predictors of PTSD Treatment Response Trajectories in a Sample of Childhood Sexual Abuse Survivors: The Roles of Social Support, Coping, and PTSD Symptom Clusters. *J Interpers Violence*. 2017;**36**(3-4):1283-1307. Available from: https://doi.org/10.1177/0886260517741212
51. Currier JM, Holland JM, Drescher KD. Residential Treatment for Combat-Related Posttraumatic Stress Disorder: Identifying Trajectories of Change and Predictors of Treatment Response. *PLoS One*. 2014;**9**(7):e101741. Available from: https://doi.org/10.1371/journal.pone.0101741
52. Sripada RK, Pfeiffer PN, Rampton J, et al. Predictors of PTSD Symptom Change Among Outpatients in the U.S. Department of Veterans Affairs Health Care System. *J Trauma Stress*. 2017;**30**(1):45-53. Available from: https://doi.org/10.1002/jts.22156
53. Wilkinson ST, Stefanovics E, Rosenheck RA. Marijuana use is associated with worse outcomes in symptom severity and violent behavior in patients with posttraumatic stress disorder. *J Clin Psychiatry*. 2015;**76**(9):1174-1180. Available from: https://doi.org/10.4088/JCP.14m09475
54. Zang Y, Su YJ, McLean CP, Foa EB. Predictors for Excellent Versus Partial Response to Prolonged Exposure Therapy: Who Needs Additional Sessions? *J Trauma Stress*. 2019;**32**(4):577-585. Available from: https://doi.org/10.1002/jts.22412
55. Feeny NC, Zoellner LA, Foa EB. Treatment outcome for chronic PTSD among female assault victims with borderline personality characteristics: a preliminary examination. *J Pers Disord*. 2002;**16**(1):30-40. Available from: https://doi.org/10.1521/pedi.16.1.30.22555
56. National Institute for Health and Care Excellence. *Post-traumatic stress disorder [NG116]*. National Institute for Health and Care Excellence. 2018. (https://www.nice.org.uk/Guidance/NG116 [01 November 2023]).
57. Galovski TE, Blain LM, Mott JM, Elwood L, Houle T. Manualized therapy for PTSD: Flexing the structure of cognitive processing therapy. *J Consult Clin Psychol*. 2012;**80**(6):968-981. Available from: https://doi.org/10.1037/A0030600
58. Resick PA, Wachen JS, Dondanville KA, et al. Variable-length cognitive processing therapy for posttraumatic stress disorder in active duty military: Outcomes and predictors. *Behav Res Ther*. 2021;**141**. Available from:

https://doi.org/10.1016/j.brat.2021.103846

59. Van Dijk DA, Meijer RM, van den Boogaard TM, Spijker J, Ruhé HG, Peeters FPML. Worse off by waiting for treatment? The impact of waiting time on clinical course and treatment outcome for depression in routine care. *J Affect Disord*. 2023;**322**:205-211. Available from: https://doi.org/10.1016/j.jad.2022.11.011
60. Tiemens B, Kloos M, Spijker J, Ingenhoven T, Kampman M, Hendriks GJ. Lower versus higher frequency of sessions in starting outpatient mental health care and the risk of a chronic course; a naturalistic cohort study. *BMC Psychiatry*. 2019;**19**(1):228. Available from: https://doi.org/10.1186/s12888-019-2214-4
61. Reese RJ, Toland MD, Hopkins NB. Replicating and extending the good-enough level model of change: considering session frequency. *Psychother Res*. 2011;**21**(5):608-619. Available from: https://doi.org/10.1080/10503307.2011.598580
62. Ronconi JM, Shiner B, Watts B V. A Meta-Analysis of Depressive Symptom Outcomes in Randomized, Controlled Trials for PTSD. *J Nerv Ment Dis*. 2015;**203**(7):522-529. Available from: https://doi.org/10.1097/NMD.0000000000000322
63. Koek RJ, Schwartz HN, Scully S, et al. Treatment-refractory posttraumatic stress disorder (TRPTSD): a review and framework for the future. *Prog Neuro-Psychopharmacology Biol Psychiatry*. 2016;**70**:170-218. Available from: https://doi.org/10.1016/j.pnpbp.2016.01.015
64. Haagen JFG, Smid GE, Knipscheer JW, Kleber RJ. The efficacy of recommended treatments for veterans with PTSD: A metaregression analysis. *Clin Psychol Rev*. 2015;**40**:184-194. Available from: https://doi.org/10.1016/j.cpr.2015.06.008
65. Laska KM, Smith TL, Wislocki AP, Minami T, Wampold BE. Uniformity of evidence-based treatments in practice? Therapist effects in the delivery of cognitive processing therapy for PTSD. *J Couns Psychol*. 2013;**60**(1):31-41. Available from: https://doi.org/10.1037/a0031294
66. Brewin CR, Cloitre M, Hyland P, et al. A review of current evidence regarding the ICD-11 proposals for diagnosing PTSD and complex PTSD. *Clin Psychol Rev*. 2017;**58**:1-15. Available from: https://doi.org/10.1016/j.cpr.2017.09.001
67. Cloitre M, Hyland P, Bisson JI, et al. *ICD-11* Posttraumatic Stress Disorder and Complex Posttraumatic Stress Disorder in the United States: A Population-Based Study. *J Trauma Stress*. 2019;**32**(6):833-842. Available from: https://doi.org/10.1002/jts.22454

68. Maercker A, Hecker T, Augsburger M, Kliem S. ICD-11 Prevalence Rates of Posttraumatic Stress Disorder and Complex Posttraumatic Stress Disorder in a German Nationwide Sample. *J Nerv Ment Dis*. 2018;**206**(4):270-276. Available from: https://doi.org/10.1097/NMD.0000000000000790

69. Karatzias T, Murphy P, Cloitre M, et al. Psychological interventions for ICD-11 complex PTSD symptoms: systematic review and meta-analysis. *Psychol Med*. 2019;**49**(11):1761-1775. Available from: https://doi.org/10.1017/S0033291719000436

3 General Discussion

Despite extensive evidence supporting the efficacy and effectiveness of psychological treatments for traumatized patients, mostly suffering from PTSD, treatment failure remains a common phenomenon. Common types of treatment failure include dropout or non-response to treatment. Although treatment failure has far-reaching consequences, there is a lack of comprehensive research on dropout and non-response, particularly in specific populations or treatment settings. Therefore, the overarching aim of this thesis was to create a comprehensive understanding of the complexity of treatment failure by generating novel knowledge on the prevalence and predictors of dropout and non-response in the treatment of traumatized populations. The first aim was to investigate the prevalence and predictors of dropout in psychological treatment provided to refugees and asylum seekers (*Publication I & Publication II*) and in trauma-focused, guideline-recommended interventions for PTSD in routine clinical care (*Publication III*). Shifting the focus to non-response, the second aim was to examine the prevalence and predictors of non-response to first-line guideline-recommended interventions for PTSD (*Publication IV*).

With regard to the overarching aim of the thesis, in the following section, the main results of the four publications will be summarized, as well as interpreted and integrated in light of previous research. Further, implications of the findings and future directions in research and clinical practice will be discussed. General strength and limitations will be presented, before closing with a conclusive summary.

3.1 Summary of findings

Being the first review investigating dropout in the treatment of refugees and asylum seekers, *Publication I* aimed to provide first time practice-oriented knowledge on the prevalence, prediction, and prevention of dropout in the treatment provided to refugees and asylum seekers. Given the limited evidence, I synthesized refugee-specific findings but additionally reviewed findings on dropout from psychological treatment in general and discussed their implementations for the refugee sample. The results showed a considerable variability in reported dropout rates, ranging from 0% to 64.7%. Further, refugee specific predictors for dropout are conceivable. These included high initial impairment, deviating perceptions and expectations of mental health and psychological treatment, as well as external treatment barriers. Effective prevention measures should prioritize promoting cultural competencies, cultural adaptation of treatment, and preparation for treatment. Additionally, it is important to foster the therapeutic alliance and strengthen hope.

Building on the review, the aim of *Publication II* was to provide first comprehensive evidence on the prevalence and predictors of dropout in psychological or psychosocial interventions for refugees and asylum seekers. The results of 28 eligible RCTs, with 39 active treatment conditions and 2,691 participants were meta-analyzed, revealing a weighted average dropout rate of 19.14%, 95% CI [14.66, 24.60]. The meta-analysis found that patients in the treatment condition were less likely to drop out compared to those in the control condition ($OR = 0.52$). The only significant predictor for dropout was the country in which the study was conducted. None of the other investigated study, sample, treatment, or therapist characteristics had a significant impact on dropout in the treatment of refugees and asylum seekers. Overall, the results of the meta-analysis suggest that, in contrast to the widespread assumption, dropout rates found in the treatment of refugees are comparable to dropout rates reported in non-refugee populations. Further, the results on predictors indicate that findings on predictors of dropout in Western samples cannot be directly applied to the refugee population. Rather, future research

should focus on refugee-specific variables, such as duration of stay in the country of resettlement and asylum status.

When examining treatment failure in traumatized populations, it is important to note the lack of research on dropout rates in specific treatment settings, particularly routine clinical care. Therefore, *Publication III* aimed to investigate the frequency and predictors of dropout in trauma-focused treatment in routine clinical care. The study included 195 adults diagnosed with PTSD, receiving trauma-focused cognitive behavioral therapy in three specialized outpatient centers. A dropout rate of 15.38%, was found, and two significant predictors for dropout were identified: age and living situation. Dropout rates were higher in younger patients, and lower in patients who lived with their parents compared to living alone. The results of the prediction performance indicated that the overall model, comprising different pretreatment variables, could not predict dropout to a practically useful level.

An understanding of the complexity of treatment failure includes further aspects, in particular treatment non-response. Using a methodology similar to the meta-analysis in Publication II, *Publication IV* was the first meta-analysis to provide comprehensive evidence on the prevalence and predictors of non-response to first-line guideline-recommended psychological treatments for PTSD. The meta-analysis comprised 86 studies, with 117 active treatment conditions and 7,894 patients. The weighted average non-response rate was 39.23%, 95% CI [35.08, 43.53]. Non-response was less frequent in the treatment condition compared to the control condition (OR = 0.22). A number of specific pretreatment predictors of treatment non-response could be identified. Higher non-response rates were found to be associated with male gender, older age, and with being a refugee or veteran. Further, baseline psychopathology, that is higher PTSD symptom severity and the presence of comorbid depressive disorder or higher depressive symptoms, were significant predictors of non-response. Treatment type and treatment format were identified as significant treatment-related predictors. Lowest non-response rates were found in treatments combining PE and CT, and in a combination of

individual and group therapy. Finally, non-response was significantly higher in studies reporting ITT analysis compared to PP. Overall, these findings indicate that treatment modifications should be considered for patients at high risk of non-response.

3.2 Revealing the complexity of Treatment Failure: integration of results and implication for future research and practice

Understanding of the complexity of treatment failure to enable learning is crucial for improvement, progress, and development. As demonstrated by the case study of M. at the beginning of this thesis, there is an urgent need to evaluate treatment failure in traumatized populations and learn from it. The integrated results of this thesis represent an important initial step towards achieving the stated goal, as they provide extensive insight into the prevalence and predictors of dropout and non-response among traumatized populations. While the previous four chapters discussed the implications of the results for the respective research area and subgroup, the following chapter will integrate the results comprehensively and present implications for future research on treatment failure and for clinical practice.

3.2.1 The complexity of occurrence: acknowledging the importance of Treatment Failure

Highly efficacious psychological interventions exist for the treatment of traumatized populations, and their evidence has been widely demonstrated (American Psychological Association, 2017). However, unique treatment challenges can occur, that may be caused by complex symptom patterns of associated disorders, particularly PTSD, or specific patient groups. These challenges can lead to treatment failure, such as dropout (e.g., Lewis et al., 2020) and non-response (e.g., Varker et al., 2020).

Regarding the prevalence of dropout, the findings of this thesis indicate that the dropout rate for both, specific subgroups and specific treatment settings, is comparable to dropout rates found in research with more typical patient groups (western samples) and study designs (RCTs). The estimated dropout rate for the treatment of refugees and asylum seekers was 19.14%, which is comparable to previous large-scale meta-analyses in western samples (19.7% in Swift &

Greenberg, 2012). The frequency of dropout for guideline-recommended treatment for PTSD in naturalistic settings was 15.38%, which is comparable to recent meta-analytic findings of dropout in RCTs (16% in Lewis et al., 2020). Therefore, although being an important problem, dropout does not appear more prevalent in the treatment offered to refugees and asylum seekers and in PTSD treatment in naturalistic settings. This contradicts previous assumptions of increased dropout rates among refugees, which was attributed to cultural differences, stressors, and language barriers (Barrett et al., 2008; Slobodin & de Jong, 2015), as well as the few previous findings in naturalistic settings, reporting dropout rates of approximately 40% (Goetter et al., 2015; Mitchell et al., 2022). Several explanations for comparable dropout rates are conceivable. For refugees, it is conceivable that the high psychological distress (e.g., high symptom severity, post-migration stressors) found in refugee populations (e.g., Liedl et al., 2016; Priebe et al., 2016) may result in a strong need for psychological treatment, which acts as a protective factor against potential dropout-enhancing factors (e.g., language barriers). However, methodological characteristics of the meta-analysis, such as the restriction to manualized therapies and the presence of experienced therapists, might also lead to low dropout rates. It is further conceivable that the challenges faced by the refugee population affect access to treatment rather than dropout. The low dropout rates in the naturalistic setting might be explained by the well-structured treatment setting provided by the analyzed outpatient centers, the effort of therapists in training, or the trauma-focused CBT itself. In addition to attempts to understand the findings on the prevalence of dropout, there are important implications of these results for future research and clinical practice. Given the proven importance of dropout, more research is needed to replicate the current findings. Future research should expand to other conditions, such as treatment for refugees in low- and middle-income countries, and provide comprehensive meta-analytic evidence for dropout in naturalistic settings. In clinical practice, therapists should be aware of the frequent occurrence of dropout and implement measures to prevent dropout. Note, that the implications of the findings for deriving preventive measures

will be discussed in the context of dropout prediction. At the same time, therapist should keep in mind that trauma-focused interventions appear to be acceptable also for refugee patients.

Regarding the occurrence of non-response, this thesis comprises the first meta-analysis specifically evaluating the prevalence of non-response to guideline-recommended PTSD treatment. The non-response rate of 39.23% is comparable to previous estimates retrieved from studies with a wider research focus (e.g., Bradley et al., 2005; Straud et al., 2019). The findings of this thesis indicate that although effective treatments for PTSD exist, a significant number of patients do not respond to treatment. Future direction in research and practice should focus on reducing the non-response rate. This implies both, modifying first-line guideline-recommended psychological interventions and considering second-line treatment options (Burback et al., 2023). Second-line treatment for PTSD may comprise psychotherapeutic innovations, such as emerging trauma-focused treatments like Imaginal Rehearsal Therapy, or trauma-focused treatment delivered at a higher intensity. Further, various pharmacological interventions or neuromodulatory approaches are conceivable (Burback et al., 2023; Koek et al., 2016). Modifications to first-line guideline-recommended interventions are based on findings on predictors of non-response and will therefore be discussed in a later chapter.

3.2.2 The complexity of prediction: prediction as basis for understanding and prevention

This thesis demonstrated that treatment failure, in particular dropout and non-response, is prevalent in the treatment of traumatized populations. However, results showed a significant heterogeneity in the prevalence rates of dropout and non-response. Therefore, it is crucial to identify predictors of treatment failure. Also learning from M.'s case, it would have been helpful if the therapist had knowledge of the variables that could have influenced the premature termination of treatment.

3.2.2.1 Dropout prediction: integration of results and implications for future research

There are several candidate predictors of dropout in the treatment of traumatized populations. Focusing on the treatment of refugees, the review of the current literature suggests an influence of refugee-specific factors, such as initial impairment, deviant expectations, and treatment barriers, on dropout. The meta-analysis revealed that none of the analyzed predictors, expect study origin country, were significant predictors of dropout in the treatment of refugees. These results indicate that previous findings on predictors of dropout in Western samples (also synthesized in Publication I) cannot be directly applied to the refugee sample. However, I found preliminary evidence of an influence of refugee-specific factors on the dropout rate. In particular, duration of stay in the host country and asylum status. These findings reinforce the conclusions of the review in Publication I, which highlighted the important role of refugee-specific variables on treatment dropout.

In trauma-focused, guideline-recommended PTSD treatment provided in routine clinical care, patients age and living situation were identified as significant predictors for dropout. Young age has been found to be a reasonably stable predictor for dropout in general (e.g., Swift & Greenberg, 2012), with mixed findings for PTSD treatment (Goetter et al., 2015; Varker et al., 2021). It can be assumed that young individuals face competing time demands (Barrett et al., 2008) or a lack of stability in their daily lives (de Soet et al., 2023), putting them at higher risk of treatment dropout. In contrast to the findings on age, which replicate previous research, the findings on living situation are novel. Parental support appears to be significant in explaining the lower dropout rate among patients living with their parents compared to living alone (de Soet et al., 2023). Note that the effect of living situation is a unique effect, i.e., when controlling for the influence of age. Regarding PTSD-specific, clinical variables, no significant predictor of dropout could be identified. These findings align with a substantial body of previous research (Snoek et al., 2021; Varker et al., 2021). However, Mitchell et al. (2022) found a significant effect of clinician-rated PTSD severity on dropout. In addition, I found a

trend indicating that negative cognitions and beliefs about post-traumatic symptoms may influence treatment dropout. Although the non-significant nature of these findings precludes drawing firm conclusions, this finding supports the assumption that PTSD-specific clinical variables are important in predicting dropout.

Therefore, future research should examine the influence of PTSD-specific variables on dropout, in particular PTSD-symptom severity (Mitchell et al., 2022) and negative cognitions associated with PTSD symptomatology. It is conceivable that negative interpretations of symptoms (e.g., “My intrusions mean that I am going mad”; see Ehlers & Clark, 2000) may be related to catastrophizing as a more general factor and could lead to reduced appraisal of difficult situations in treatment being manageable (Bryant et al., 2007). Bryant et al. (2007) indeed found that catastrophic thinking was associated with a higher risk of dropout, even when controlling for PTSD severity. A consideration of underlying mechanisms, that is understanding the interaction between a tendency to catastrophize, negative interpretation of symptoms, and trauma-focused treatment, may be important in predicting dropout. In addition, future research on predictors of dropout should examine a wider range of potential predictors, in particular clinical variable relevant to PTSD, as discussed above, and refugee-specific factors. For refugee samples, these include an explicit examination of the influence of post-migration stressors, culturally specific perceptions of mental health and psychological treatment, as well as deviating treatment expectations. Note, however, that in line with previous studies (Vöhringer et al., 2020), although significant predictors of dropout in the treatment of traumatized populations have been identified, dropout could not be predicted to a practically useful level.

Therefore, the cumulative findings of this thesis indicate the need to also look beyond pretreatment variables when predicting dropout. Several novel research directions are conceivable. First, future research should examine the influence and moderating effect of process factors on dropout. On the one hand, process factors can relate to changes within the patient. These include patterns of symptom change during treatment, such as the rate of

improvement. Zandberg et al. (2016) showed that the slope of PTSD improvement significantly predicted dropout, with baseline PTSD severity moderating the effect of improvement on dropout. In addition, symptoms may exacerbate in the course of treatment and new symptoms, such as shame or self-blame, may arise (Berk & Parker, 2009; Lewis et al., 2020). Patients may also experience a change in therapeutic goals, motivation, or certain expectations, which may lead to dropout. On the other hand, process factors can relate to the therapist-patient interaction, that is changes in the therapeutic relationship. Roos and Werbart (2013) described an influence of the rate of development of the therapeutic alliance during treatment on dropout. Low early alliance predicted dropout, while a strong early alliance had a protective effect. It is important to note, that the development and maintenance of the therapeutic alliance may be influenced by underlying psychopathological patterns, such as interpersonal problems (Roos & Werbart, 2013). The fact that interpersonal problems play an important role in PTSD, in particular in cPTSD, emphasizes the need to consider underlying mechanisms of change, as already described for catastrophic thinking. Therefore, a second novel research approach could involve investigating the influence of underlying mechanisms on dropout. A third novel approach that emphasizes the importance of considering predictors beyond baseline variables is presented by Lutz et al. (2021). Ecological Momentary Assessment (EMA) collected over a specific period of time prior to treatment initiation may represent a novel form of pre-treatment assessment. In an initial pilot study, Lutz et al. (2018) found that pre-treatment EMA assessment explained an additional 26% of the variance in dropout, while baseline predictors explained 6% of the variance in dropout. Therefore, pre-treatment EMA assessment may be a promising predictor of dropout beyond baseline predictors. However, further research is needed to consolidate these findings. Last, future research should focus on a detailed consideration of the tolerability of trauma-focused treatments for PTSD in general and refugee populations in particular. As mentioned in the thesis introduction, despite the extensive empirical evidence supporting trauma-focused interventions for PTSD in general (Martin et al., 2021) and refugees in

particular (Thompson et al., 2018), there are concerns about the tolerability (Foa et al., 2002; Hembree et al., 2003), and previous refugee-specific research has raised concerns about the risk of re-traumatization due to exposure therapy (Neuner et al., 2004; Nickerson et al., 2011). Given the mixed evidence for an influence of trauma-focus on dropout in PTSD treatment (e.g., Imel et al., 2013; Varker et al., 2021) and the lack of findings specific for refugee populations, it is important to consider this issue in future research.

To conclude, besides future research directions regarding content-related considerations, there are also methodological considerations for further research. Individual participant data meta-analysis (IPD-MA) is a novel approach that is currently considered as gold standard in generating evidence (Veroniki et al., 2023). Examining dropout in traumatized populations with IPD-MA goes beyond aggravating data on a study level and allows analyzing a large set of predictors on a participant-level and specifically analyzing subgroups of patients. Further, by accounting for missing outcome data using specific imputation techniques, it is possible to run multiple prediction models that can be used to predict dropout at a practically useful level.

3.2.2.2 Non-Response prediction: integration of results and implications for future research

Examining non-response to guideline-recommended interventions for PTSD, a number of specific pretreatment predictors could be identified. Integrating the findings of the current thesis with previous research, it is important to note that this meta-analysis was the first comprehensive study to examine non-response to PTSD treatment. However, the findings reinforce previous research with a broader focus, primarily on treatment response. The findings on demographic characteristics predicting non-response, namely older age, male gender, and being a refugee or veteran, are consistent with previous findings suggesting similar associations (age: Dewar et al., 2020; gender: Fonzo et al., 2020). However, note that previous findings are

not consistent (Barawi et al., 2020; Fonzo et al., 2020; Paiva et al., 2022). According to Dewar et al. (2020), the association with older age may be explained by a decreased cognitive flexibility required to meet the high cognitive demands of psychological treatment, such as adapting maladaptive patterns. With regard to gender, it can be assumed that the findings may be confounded by other variables, particularly the type of trauma, e.g., men are more likely to experience combat-related trauma, whereas sexual assault is more common among women (Bradley et al., 2005; Tolin & Foa, 2006). The confounding of effects by trauma type, particularly combat-related trauma, and trauma severity are conceivable explanations for higher non-response in refugee and veteran populations as well (Dewar et al., 2020; Fonzo et al., 2020). As combat exposure has been found to be predictive of non-response in previous research, future studies need to identify the unique effect of the sample population on non-response. In addition, examining specific characteristics of traumatic events and understanding their unique influence on non-response may be important to understanding the complexity of non-response (Dewar et al., 2020). Besides trauma type, other veteran-specific variables, such as physical health burden or pain (Magruder et al., 2005), as well as refugee-specific cultural characteristics, such as post-migration stressors or deviating beliefs and expectations (e.g., Liedl et al., 2016), might influence treatment non-response.

Looking at baseline psychopathology, non-response was predicted by high PTSD symptom severity and comorbid depressive disorder, again adding to previous research approaches (Barawi et al., 2020; Fonzo et al., 2020). High PTSD symptom severity at baseline may interfere with treatment engagement due to high levels of avoidance (Barawi et al., 2020; Pineles et al., 2011). It is important to note, however, that findings regarding PTSD symptom severity predicting higher non-response have not been consistent (Dewar et al., 2020). Therefore, future research is needed to replicate these findings. There are several possible explanations for the association between non-response and comorbid depression. According to emotional processing theory, it is conceivable that the modification of the traumatic memories

is hindered by the reduced emotional activation caused by the comorbid depression (Angelakis & Nixon, 2015; Jaycox et al., 1998). However, other explanations are also conceivable, such as a more frequent use of avoidance strategies, rumination, overgeneralization, or the influence of sleep disturbances (Barawi et al., 2020; Dewar et al., 2020). As the exact mechanisms of the influence of comorbid depression on trauma processing are still unknown, future research should focus on identifying such mechanisms.

In addition, the results of this thesis showed that certain treatment characteristics were predictive for non-response. Treatment type significantly predicted non-response, with higher non-response rates in NET trials. From previous findings, there is no comprehensive evidence on the influence of different types of guideline-recommended treatments on non-response, and findings from efficacy studies are mixed (Watts et al., 2013). As the tolerability of trauma-focused treatments is often discussed, future research should focus on comparing non-response between trauma-focused and non-trauma-focused treatments. In addition, given the limitations discussed in the previous chapter, the findings on the influence of treatment type need to be more closely examined in a larger sample in future research. Besides treatment type, I found a significant influence of treatment format predicting non-response. A comprehensive integration and interpretation of these findings does not seem permissible due to the small sample size in the distinct category and the lack of previous evidence. Therefore, future research is needed to investigate whether the findings of low non-response rates in a combination of individual and group treatment can be replicated in a larger sample.

A cumulative integration of the results shows that several concrete directions for future research can be directly derived from the findings of this thesis, as described above. In addition, further research approaches are conceivable. Due to the described importance and the possible confounding with other variables, future research is needed that comprehensively investigates the influence of trauma type on non-response. It would also be interesting to evaluate the effect of specific cognitive factors on treatment non-response (Fonzo et al., 2020). In particular, verbal

memory is known to be central to the psychotherapeutic process, such as trauma memory retrieval in imaginal exposure, and therefore deserves attention (Nijdam et al., 2015). Other variables of interest may include social support (Fletcher et al., 2017), physical health (Currier et al., 2014), and other comorbid disorders common in PTSD, such as sleep disorders (Sripada et al., 2017), alcohol and substance use disorders (Wilkinson et al., 2015; Zang et al., 2019), and borderline personality disorder (Feeny et al., 2002). In addition to considering alternative baseline predictors, a promising novel approach is to go beyond baseline variables and consider pre-treatment EMA data. Husen et al. (2016) found a prediction of early treatment response by EMA (21.7% additional variance) beyond symptom impairment (16.1% variance). Although more research is needed, this new approach seems promising for predicting non-response.

Thinking big, a valid prediction of non-response requires, simultaneously to the methodological considerations described for dropout, large data sets. Fonzo et al. (2020) discussed machine learning as a possible approach to create useful predictive models consisting of multiple variables from different domains. Testing these models across different sites and populations would allow for generalization

3.2.2.3 Implications for clinical practice: preventing dropout and non-response

From a clinical perspective, understanding the complexity of treatment failure and its predictors provides important indications for reducing and preventing dropout and non-response. Considering the case of M., based on the results of this thesis, specific factors can be identified that have been shown to influence the risk of treatment failure. M. is a young patient with PTSD and comorbid depression whose symptom pattern is characterized by negative cognitions towards post-traumatic symptoms. How could M.'s therapist have used the knowledge about the presence of predictors of treatment failure? What preventive measures can be derived from the findings of this thesis?

A starting point for dropout prevention in traumatized populations may be to pay special attention to patients who, due to their demographic characteristics, are at higher risk of dropping out. When treating younger patients, therapists should be sensitive to competing time demands and to possible sudden crises, and pay particular attention to specific social needs (Coulter & Ellins, 2006). Therapists can also act as supportive guides, especially in the absence of parental support (Swift & Greenberg, 2012). However, the cumulative findings of this thesis show that it is still difficult to identify patients at risk of dropout based on pre-treatment predictors. The majority of the predictors examined in this thesis did not show a significant association with dropout. This needs to be considered when deriving preventive measures. An effective prevention strategy to reduce dropout appears to be adequate preparation for treatment through preparatory sessions. Patients should be informed about the expected duration of treatment, and unrealistic expectations about recovery should be reduced (Swift & Callahan, 2011). At the same time, role expectations should be clarified (Swift et al., 2012) and the patient's preferences and choices should be enhanced (Lewis et al., 2020). Due to cultural differences in perceptions and beliefs about mental health, treatment, and therapists, treatment preparation appears to be particularly important in the treatment of refugees and asylum seekers. In addition, it is important to promote cultural competencies for therapists, as these help to foster the therapeutic alliance, build trust, and create hope (Liedl et al., 2016). Furthermore, recent studies suggest that an effective strategy for preventing dropout in PTSD treatment is to modify treatment characteristics, particularly the frequency of sessions. Hoppen et al. (2023) demonstrated lower dropout rates in trauma-focused treatments delivered at high intensity. In trauma-focused treatments, dropout occurs primarily in the early course of treatment (Gutner et al., 2016). Therefore, intensive treatment seems to be particularly useful at this time to intercept potentially intense negative emotions and emergent avoidance associated with the trauma process (Hoppen, Jehn, et al., 2023). In conclusion, it should be noted that although a few empirical studies on the effectiveness of proposed measures to prevent dropout exist, evidence is still limited,

especially for refugees and asylum seekers. Therefore, future research is needed to evaluate the effectiveness of existing strategies, in particular for this specific patient group, and to develop new preventive measures.

With regard to non-response, it can be assumed that an effective strategy to reduce non-response in the treatment of PTSD requires a modification of existing treatment approaches for specific subgroups of patients who have been shown to be at higher risk of non-response. Modification of guide-line recommended interventions may involve the treatment elements themselves, but may also affect related treatment characteristics, such as allowing flexibility in the duration of treatment (Galovski et al., 2012) or reducing waiting times (van Dijk et al., 2023). Besides treatment modifications, offering adjuvant or second-line treatment options can be necessary when non-response to guide-line recommended treatments is likely (see previous section for details). In addition, the present findings suggest that it is highly important to consider the presence of comorbid disorders, particularly comorbid depressive disorder, or high rates of depressive symptoms. Although trauma-focused treatments for PTSD with comorbid depression are recommended by guidelines (American Psychological Association, 2017), treatment success may be enhanced by additionally targeting depressive symptoms (Ronconi et al., 2015). Special focus should be placed on mechanisms that frequently occur in depression and that could interfere with trauma treatment. It is conceivable that reduced emotional engagement influences treatment outcome through underling mechanisms such as emotional numbing, emotional dysregulation, or rumination (Angelakis & Nixon, 2015). However, understanding underlying mechanisms requires future research. Therapists should focus on the individual needs of the patient and decide whether trauma-focused treatment is likely to reduce depressive symptoms, or whether it is more promising to reduce depressive symptoms before engaging in trauma-focused treatment (Barawi et al., 2020). Cloitre et al. (2017) examined such treatment integrations, showing that the combination of trauma-focused treatment and skills training improved treatment outcomes for PTSD patients with comorbid depression. To

conclude, when recommending specific treatments to traumatized patients, it is important to consider the complexity of variables associated with non-response. Under no circumstances should this lead to the exclusion of patients with specific characteristics (Barawi et al., 2020). Rather, the complexity of non-response may indicate the importance of greater efforts towards personalization in the treatment of traumatized patients (Herzog & Kaiser, 2022). This implies treatment recommendation and selection procedures based on valid prediction algorithms (Chekroud et al., 2021), such as the Personalized Advantage Index (PAI) (DeRubeis et al., 2014). The PAI has already been investigated for PTSD treatment (Deisenhofer et al., 2018). In addition, personalizing treatment implies changing treatment approaches when non-response is expected (Gloster et al., 2020; Herzog & Kaiser, 2022).

3.2.3 The complexity of construct: advances in definitional understanding and further considerations

Understanding the complexity of treatment failure, that is examining the prevalence and predictors of dropout and non-response, always requires an understanding of the construct. Therefore, the definition and operationalization of dropout and non-response is an important challenge underlying this thesis. For both dropout and non-response, there is currently no consensus on a uniform definition and operationalization. In the meta-research of this thesis (Publication II and Publication IV), the definition and operationalization methods reported by the authors of the original studies was used. In the empirical work in Publication III, dropout was assessed using therapist judgment and patient-initiated termination. The cumulative results of Publication II and Publication IV showed that the different methods of operationalizing dropout and non-response did not affect dropout or non-response rates. These findings suggest that the classification of dropout and non-response appears to be robust to different types of operationalization.

However, given the challenges and limitations of the thesis, it seems useful for future research to discuss whether the same construct is measured by the different operationalization methods (Hatchett & Park, 2003). With regard to dropout, an important question that has been repeatedly discussed in previous studies is whether dropout always indicates treatment failure (Larsen et al., 2023). Defining dropout as a unilateral decision by the patient without mutual agreement distinguishes dropout from those cases in which the therapist and patient decide that the outcome is satisfactory, even before the full course of treatment has been completed (Baldwin et al., 2009; Falkenström et al., 2016; Imel et al., 2013). However, there are operationalization methods, such as duration-based operationalization or missed appointment classification, that have a high risk of misclassifying patients with early treatment success and rapid recovery, especially when the reasons for dropout are not known (Imel et al., 2013; O'Keeffe et al., 2019; Varker et al., 2021). Therefore, the lack of a uniform definition and operationalization leads to high inconsistency in findings and the likelihood of subsuming several different constructs when using the term dropout (Swift et al., 2009). Based on the findings and implementations of this thesis, it seems necessary to distinguish between the various concepts. The term *treatment discontinuation* could be introduced as an umbrella term that subsumes dropout and early completion, i.e., *negative dropout* and *positive dropout*. Such a definitional distinction requires a uniform operationalization. Combining a subjective method, i.e., therapist judgment, with an objective outcome measure, such as Clinical Significant Change (CSC) or Reliable Change (RC), would be recommended (compare with Swift et al., 2009). In addition, future research is needed to examine a more nuanced classifications of *negative dropout*, such as treatment-related and non-treatment-related dropout (Cinkaya, 2016) or other proposed classification (O'Keeffe et al., 2019).

With regard to non-response, although the present findings did not indicate an effect of the operationalization method on non-response rates, there is a need for a uniform definition and operationalization of non-response. The urgent need for standardization is reinforced by

the various concerns arising from different operationalization methods and differences in the assessment tools underlying the classifications (for a detailed presentation of the challenges, see the introduction). A first step for future research is to empirically validate the proposed operationalization methods and to adapt the criteria to the different assessment tools most commonly used (Varker et al., 2020). In addition, further research should focus on how and to what extent functional outcome measures can be used to classify non-response. In particular, the identification of a standardized measure of functionality appears to be critical (Lam et al., 2015). Bonfils et al. (2022) provided the first insight into understanding the impact of psychotherapeutic treatment for PTSD on functional outcomes and quality of life. Another important novel approach is the use of multidimensional symptom scales to assess response rather than disorder-specific outcome measures (Lutz et al., 2021). Particularly for PTSD, which is often associated with comorbid disorders, multidimensional scales may provide a more valid and reliable measure of treatment effects and thus non-response (Hill & Lambert, 2004).

In addition to the type of outcome measures, the complexity of the construct non-response also comprises methodological challenges due to the decision on the timepoint of outcome assessment (Lutz et al., 2021). Pre-post measurement on the intended outcome measure is a common research practice used to assess change. However, alternative approaches need to be considered when conceptualizing non-response.

First, the role of continuous outcome assessment throughout the course of treatment must be addressed. Routine outcome monitoring (ROM) is employed to assess the treatment progress, provide feedback, and adapt the treatment plan if necessary. A common measure used to support ROM and inform decisions about the current response are clinical significance criteria (Barkham et al., 2023). Further, Expected Treatment Response (ETR) models can be used (Lutz et al., 1999). These models serve to identify patients at risk of treatment failure by comparing the predicted and the actual treatment progress (Lutz et al., 2021). It is important to note that non-response, by definition, refers to the inability to achieve a predefined criterion of

change after termination of an adequate treatment (i.e., pre-post treatment) (Larsen et al., 2020; Smith-Apeldoorn et al., 2019; Varker et al., 2020). However, given the potential of ROM to identify patients at risk of non-response, it is important to consider ROM in non-response research. This requires a differentiation of related constructs depending on the time of measurement. Being at risk of non-response, i.e., being *not on track* according to progress assessment, needs to be distinguished from not responding to a terminated treatment (Lutz et al., 2021; Varker et al., 2020).

Second, it is important to consider the long-term effects of treatment when conceptualizing non-response. A substantial body of evidence supports the long-term efficacy of PTSD treatment (Klaeth et al., 2024; Kline et al., 2018; Weber et al., 2021). Furthermore, there is evidence indicating an ongoing improvement following termination of treatment (Kline et al., 2018; von Brachel et al., 2019). It is conceived that the continued use of learned strategies or reduction in avoidance behavior may enhance the treatment effects beyond termination of treatment. Therefore, (additionally) considering follow-up measures when conceptualizing non-response may be promising.

In conclusion, it becomes evident that a unified definition of dropout and non-response, with a nuanced distinction from related concepts and a clear recommendation for operationalization, has several implications for research and practice. In clinical research, this would lead to improved reporting and comparability across trials, allowing for better meta-research (Larsen et al., 2020; Lewis et al., 2020). In clinical practice, standardization of definition and operationalization will help to improve decision-making, treatment planning, and a clear communication with patients (Larsen et al., 2020; Varker et al., 2020).

3.3 General strengths and limitations

This thesis provides an important contribution to a comprehensive understanding of the complexity of treatment failure, particularly dropout and non-response in the treatment of traumatized populations. This thesis has several important strengths. A major strength is that each of the four publications addresses specific areas of treatment failure that have not yet been investigated or have only been studied to a limited extent. This thesis provides the first practice-oriented review on dropout in the treatment of refugees and asylum seekers (Publication I) and the first meta-analysis on the prevalence and predictors of dropout in this understudied subgroup (Publication II). In addition, dropout in understudied treatment settings, i.e., routine clinical care was examined (Publication III). With regard to non-response, the thesis again provides the first meta-analysis of the prevalence and predictors of non-response to guideline-recommended treatment for PTSD (Publication IV). In addition to the novelty, another important strength is the methodological quality of the studies. This thesis can rely on the highest level of evidence, i.e., reviews and meta-analyses, to answer important research questions related to dropout and non-response. Both meta-analyses meet the highest scientific standards, such as pre-registration, timeliness of the study inclusion, PRISMA standards, high interrater reliability, and open science standards, such as open data, open code, and open access publication. In the primary study, the methodological quality is demonstrated by the use of complex statistical procedures, in particular multiple imputation.

Nevertheless, there are a number of general limitations that must be considered when interpreting the results of the four publications. First, the validity of the predictor analyses, i.e., subgroup analysis for meta-analyses and multiple logistic regression analysis for the primary study, needs to be considered when interpreting the results. In the meta-analyses, despite great effort to increase the number of eligible studies, such as complex search strategies, the number of eligible studies was reduced for some variables. One issue that surpasses the absolute quantity of studies included, which was significant for refugee research and very high for non-

response, is the inadequate reporting of data in the studies included (Swift & Greenberg, 2012). Insufficient completeness of data reduces the amount of data in certain variables, especially in distinct subcategories of variables. In addition to reducing the statistical power, insufficient completeness also resulted in the need to analyze variables separately rather than entering them simultaneously in a multiple predictor model. The statistical power of the predictor analyses in the primary study may be reduced due to the small number of patients available, despite combining data from three different outpatient centers.

Second, a general limitation of the thesis is the focus on a specific set of variables as predictors of interest. Although the variables were selected on the basis of previous research (e.g., Swift & Greenberg, 2012) and theoretical considerations, there might be other variables of interest that could influence the dropout and non-response rate. On the one hand, these include other baseline predictors of interest, such as distinct refugee-specific variables (e.g., post-migration stressors), certain PTSD-related variables (e.g., trauma type), and variables associated with cPTSD (e.g., interpersonal problems). On the other hand, focusing on underlying mechanisms (e.g., catastrophic thinking), cognitive factors (e.g., verbal memory), or process variables (e.g., patterns of change) might be important.

Third, the results of the studies could be influenced by the operationalization method of dropout and non-response. Although the subgroup analyses in the meta-analyses in Publication II and Publication IV did not show a significant effect of the operationalization method on dropout and non-response rates, the operationalization method as reported by the authors of the studies was used. Therefore, the potential variability in the quality of assessment and reporting of dropout and non-response between studies may have influenced the results of this thesis. To improve the comparability between studies, it is recommended to establish a common definition and operationalization of dropout and non-response, as well as reporting standards (Larsen et al., 2020). In Publication III, dropout was operationalized by therapist judgment and patient-initiated termination. This method was chosen due to the naturalistic

setting of the study. Although a comprehensive file analysis was conducted to improve the quality of dropout classification, misclassification cannot be completely ruled out. Therefore, it may be useful to include complementary objective outcome monitoring as an additional measure for classification decisions in future research.

Last, a major part of the findings of this thesis are based on meta-research, i.e., reviews and meta-analyses. Although providing a high level of evidence, meta-analytic research is subject to bias (*garbage in, garbage out*), that is the quality of the results of meta-research depends on the quality of the included studies (Egger et al., 2001). To address this issue, the risk of bias for each included study was assessed using the Cochrane Risk of Bias Assessment Tool, a gold standard instrument. Due to variations in the quality of the included studies, a potential threat to the internal validity of the findings cannot be ruled out.

3.4 Conclusion

This thesis provides a comprehensive understanding of the complexity of treatment failure in traumatized populations. The integrated findings of the four publications generate fist-time knowledge on the prevalence and predictors of dropout and non-response in the treatment of PTSD in general, in specific subpopulations of traumatized patients, and in specific treatment settings. Regarding the prevalence of dropout, the results showed that about 20% of refugees and about 16% of PTSD patients in routine clinical care terminated treatment prematurely. Contradicting previous assumptions, these findings suggest that dropout does not appear to be more prevalent in the treatment offered to refugees and asylum seekers (compared to non-refugee samples) and in PTSD treatment in naturalistic settings (compared to RCTs). However, more research is needed to substantiate these findings. To predict dropout in refugee treatment, the present findings point out to the importance of refugee-specific variables, such as asylum status and duration of stay in the host country. Therefore, future research should focus on examining additional refugee-specific variables, such as post-migration stressors and culture-specific expectations. In trauma-focused treatment in routine clinical care, higher dropout rates were found among younger patients and those no longer living with their parents. As early prediction of dropout by baseline variables still seems challenging, the findings suggest that future research is needed to look beyond pretreatment factors.

Regarding non-response, the present results suggest that a substantial number of patients, about 40%, do not respond to guideline-recommended PTSD treatment. These numbers are consistent with previous estimates, therefore future research should focus on reducing non-response rates. A number of significant predictors of non-response could be identified, including demographic variables, namely male gender, older age, and being a refugee or veteran; baseline psychopathology, namely PTSD symptom severity and comorbid depression; and treatment characteristics, namely treatment type and treatment format. Future

research should focus on examining underlying mechanisms, potential confounding variables, and additional baseline predictors and process variables.

In conclusion, understanding the complexity of treatment failure and its predictors has important implications for clinical practice. Preventing dropout may require an adequate preparation for treatment, while modifying existing treatment approaches and offering adjuvant or second-line treatment options to specific subgroups of PTSD patients may hold promise for reducing non-response.

4 Deutsche Zusammenfassung

Die Komplexität von Therapiemisserfolg - Prävalenz und Prädiktoren von Dropout und Non-Response in der psychologischen Behandlung von Menschen mit Traumaerfahrung

Zahlreiche Studien deuten auf die Wirksamkeit psychotherapeutischer Verfahren bei der Behandlung von Menschen mit traumatischen Erfahrungen hin. Derzeit gelten traumafokussierte Therapien als in Leitlinien empfohlene Behandlungsverfahren (American Psychological Association, 2017; Martin et al., 2021). Auch für die Behandlung spezifischer Bevölkerungsgruppen wie Geflüchtete und Asylsuchende können psychologische Interventionen wirksam eingesetzt werden (Kip et al., 2020; Nose et al., 2017; Thompson et al., 2018). Jedoch ist eine psychotherapeutische Behandlung nicht immer wirksam. Vielmehr sind Therapiemisserfolge, wie ein vorzeitiges Abbrechen der Behandlung (Dropout) oder ein Nicht-Ansprechen auf die Behandlung (Non-Response) häufige Phänomene. Obgleich ein Verständnis von Therapiemisserfolg von großer Bedeutung für die Verbesserung psychotherapeutischer Verfahren ist und es zahlreiche Belege für die weitreichenden Folgen gibt, ist die Erforschung von Therapiemisserfolg derzeit noch unzureichend.

Therapiemisserfolg ist ein komplexes Konstrukt, das verschiedene Aspekte unerwünschter Behandlungsverläufe umfasst (Oasi & Werbart, 2020). Ohne ein klar definiertes konzeptuelles Rahmenmodell gibt es zahlreiche Herausforderungen bei der Definition und Operationalisierung der eingeschlossenen Aspekte (Lampropoulos, 2010). Die zentralen Themen dieser Arbeit, Dropout und Non-Response, sind Teil des Konstrukts. Es ist wichtig, eine klare Abgrenzung zu anderen negativen Behandlungsergebnissen wie Verschlechterung oder Therapieresistenz sowie zu positiven Behandlungsergebnissen wie Ansprechen, Remission und Genesung zu schaffen. Dropout ist definiert als der vorzeitige Abbruch einer Behandlung, bevor die Symptome, die zur Behandlung geführt haben, gelindert sind (Swift & Greenberg, 2012). Non-Response kann als geringe oder keine Symptomreduktion nach Abschluss einer evidenzbasierten, leitliniengerechten Behandlung definiert werden (Smith-Apeldoorn et al., 2019). In der Literatur besteht derzeit kein Konsens über eine einheitliche Definition und Operationalisierung von Dropout und Non-Response.

Forschungsergebnisse zeigen, dass die Behandlung von Menschen mit traumatischen Erfahrungen, die häufig an einer Posttraumatischen Belastungsstörung (PTBS) leiden, spezifische Herausforderungen aufweist. Diese können zu Therapiemisserfolg führen, insbesondere zu Dropout und Non-Response. Die therapeutischen Herausforderungen können direkt durch Charakteristika des posttraumatischen Störungsbildes, aber auch durch assoziierte Schwierigkeiten oder komorbide Krankheitsbilder bedingt sein (Burback et al., 2023; Kline et al., 2021). Spezifische Herausforderungen zeigen sich darüber hinaus bei der Behandlung von Geflüchteten und Asylsuchenden, die aufgrund multipler Stressoren komplexe Störungsbilder aufweisen (Nickerson et al., 2011). Anhaltende Belastungen, spezifische Hürden und kulturspezifische Erwartungen können den Behandlungsverlauf zusätzlich negativ beeinflussen (Liedl et al., 2016). Schlussfolgernd ist eine detaillierte Betrachtung von Dropout und Non-Response bei der Behandlung von PTBS sowie bei spezifischen Patientengruppen wie Geflüchteten von besonderer Bedeutung.

Bisherige Befunde zeigen, dass in etwa 20% der Patienten eine begonnene PTBS Behandlung vorzeitig abbrechen (Varker et al., 2021). Über die Häufigkeit von Dropout in der Behandlung spezifischer Patientengruppen (Geflüchtete) und in spezifischen Therapiesettings (ambulante Behandlung) ist derzeit wenig bekannt. Dropout kann durch verschiedene Variablen beeinflusst werden. Diese Variablen betreffen Charakteristika des Patienten, der Behandlung, des Therapeuten, oder können sich auf Studienmerkmale beziehen. Während sich über verschiedene Störungsbilder hinweg junges Alter als ein relativ konsistenter Prädiktor zeigt (Swift & Greenberg, 2012), scheint bei der Behandlung von PTBS eine Betrachtung störungsspezifischer Prädiktoren, wie PTBS Symptomschwere, von Bedeutung zu sein (Mitchell et al., 2022). In Bezug auf Behandlungsvariablen werden die Sitzungsanzahl und das Therapieformat diskutiert sowie, bei PTBS Behandlungen, der Einfluss des Traumafokus (Hoppen, Kip, et al., 2023; Swift & Greenberg, 2012). Das Erfahrungsniveau des Therapeuten scheint darüber hinaus Einfluss auf Dropout zu haben (Roos & Werbart, 2013). Bei der

Behandlung von Geflüchteten können mögliche Prädiktoren für Dropout bisher nur aus theoretischen Überlegungen abgeleitet werden (Liedl et al., 2016).

Obwohl es derzeit keine spezifische Evidenz zur Prävalenz und zu den Prädiktoren für Non-Response bei der Behandlung von PTBS gibt, lassen sich Rückschlüsse aus vorangehenden Studien mit ähnlichem Forschungsfokus ziehen. Diese zeigen, dass in etwa 40-50% der Patienten, die eine PTBS Behandlung abschließen, nicht ausreichend von der Behandlung profitieren (Bradley et al., 2005; Schottenbauer et al., 2008). Wie bei Dropout kann auch das Auftreten von Non-Response durch Prädiktoren aus den vier Domänen beeinflusst werden. Die Befunde sind jedoch inkonsistent. Bezüglich Patientencharakteristika gibt es Hinweise auf einen Einfluss von höherem Alter, männlichem Geschlecht, PTBS Symptomschwere, Art des Traumas, sowie das Vorhandensein einer komorbiden Störung (Barawi et al., 2020; Dewar et al., 2020; Fonzo et al., 2020). Äquivalent zu Dropout werden ebenfalls Behandlungsvariablen und Therapeutencharakteristika untersucht, mit inkonsistenten Befunden (Barawi et al., 2020; Goodson et al., 2017).

Zusammenfassend wird deutlich, dass trotz des Vorhandenseins evidenzbasierter psychologischer Behandlung für Menschen mit Traumaerfahrungen ein erheblicher Anteil der Patienten nicht ausreichend von der Behandlung profitiert oder diese vorzeitig abbricht. Obwohl das Auftreten von Behandlungsmisserfolgen weitreichende Folgen hat, mangelt es an umfassender Forschung zu Dropout und Non-Response bei der Behandlung traumatisierter Patienten, insbesondere in bestimmten Patientengruppen oder Behandlungssituationen. Das übergeordnete Ziel dieser Arbeit war es daher, durch neuartige Evidenz über die Prävalenz und die Prädiktoren von Dropout und Non-Response in der Behandlung von Menschen mit Traumaerfahrungen, ein umfassendes Verständnis für die Komplexität von Therapiemisserfolg zu schaffen. Zu diesem Ziel wurden vier Publikationen erstellt. Die ersten drei dieser Publikationen untersuchen die Prävalenz und die Prädiktoren von Dropout in wenig erforschten Bereichen, nämlich bei der Behandlung von Geflüchteten und Asylsuchenden sowie in

ambulanten Behandlungssettings. Die vierte Publikation untersucht dieselbe Forschungsfrage für Non-Response bei der Behandlung von PTBS.

Publikation I und *Publikation II* untersuchten die Prävalenz und die Prädiktoren von Dropout in der psychologischen Behandlung von Geflüchteten und Asylsuchenden. Geflüchtete gelten als hoch belastete, meist mehrfach traumatisierte Patientengruppe, deren Behandlung besondere Herausforderungen mit sich bringt, die das Auftreten von Dropout beeinflussen können. Trotz dieser Herausforderungen wurde diese Patientengruppe in der Dropoutforschung bislang vernachlässigt. Das Ziel der beiden Arbeiten war es daher, erste Evidenz zu Dropout bei Geflüchteten zu schaffen.

In einem ersten Schritt wurde in *Publikation I* ein praxisorientiertes Review durchgeführt. Aufgrund fehlender evidenzbasierter Forschungsergebnisse zu Dropout bei Geflüchteten wurde zum einen die vorhandene geflüchteten-spezifische Literatur untersucht und zum anderen Implikationen der gesammelten Erkenntnisse zu Dropout aus psychologischen Interventionen im Allgemeinen im Kontext der Behandlung von Geflüchteten diskutiert. Darüber hinaus wurde eine Übersicht über Maßnahmen zur Prävention von Dropout erstellt. Die Ergebnisse zeigten eine erhebliche Variabilität der berichteten Dropoutraten mit einer Spanne von 0% bis 64,7%. Ferner schienen Prädiktoren, die speziell bei Geflüchteten relevant sind, einen Einfluss auf die Dropoutrate zu haben. Dazu gehören eine hohe Belastung bei Behandlungsaufnahme, externe Barrieren sowie kulturspezifische Ansichten über psychische Gesundheit und Unterschiede in den Erwartungen an psychologische Behandlung. Effektive Präventionsmaßnahmen sollten sich auf die Förderung interkultureller Kompetenzen, die kultursensible Vorbereitung auf die Behandlung, sowie die kulturelle Adaptation der Intervention selbst konzentrieren. Darüber hinaus scheinen die Stärkung der therapeutischen Allianz sowie das Wecken von Hoffnung wichtige Maßnahmen zur Prävention von Dropout in der Behandlung von Geflüchteten zu sein.

Auf diesen Ergebnissen aufbauend liefert *Publikation II* die erste quantitative Synthese zu Prävalenz und Prädiktoren von Dropout aus psychologischen Interventionen bei Geflüchteten. Die Metaanalyse umfasste 28 randomisierte kontrollierte Studien (RCT) mit Daten aus 39 aktiven Behandlungsbedingungen und 2.691 Patienten. Die gewichtete mittlere Dropoutrate betrug 19,14%, 95% KI [14,66; 24,60]. Die Ergebnisse zeigten außerdem geringere Dropoutraten in der Behandlungsgruppe im Vergleich zur Kontrollbedingung (*OR* = 0,52). Der einzige signifikante Prädiktor für Dropout war das Land, in dem die Studie durchgeführt wurde. Keines der anderen untersuchten Studien-, Stichproben-, Behandlungs- oder Therapeutenmerkmale hatte einen signifikanten Einfluss. Die Analyse ergab jedoch einen Trend für die Prädiktorvariablen Asylstatus und Dauer des Aufenthalts im Neuansiedlungsland. Die Ergebnisse deuten darauf hin, dass Prädiktoren für Dropout, die für westliche Patientengruppen gefunden wurden, nicht direkt auf geflüchtete Patienten übertragen werden können. Zusätzlich weisen die Ergebnisse auf die Bedeutung von geflüchteten-spezifischer Variablen hin.

Neben Forschungslücken in Bezug auf spezifische Gruppen traumatisierter Patienten wurde bislang wenig Aufmerksamkeit auf Dropout in spezifischen Behandlungssettings gerichtet. Der Großteil der Forschung zu Dropout in der PTBS Behandlung stammt aus RCT-Studien. Aufgrund des kontrollierten Studiendesigns scheint eine Übertragung der Ergebnisse auf natürliche Behandlungssituationen jedoch problematisch. Das Ziel der *Publikation III* war es daher, die Dropoutrate sowie Prädiktoren für Dropout in ambulanter, traumafokussierter Behandlung für PTBS zu untersuchen. Die Studie umfasste 195 erwachsene Patienten mit diagnostizierter PTBS, welche in drei ambulanten Zentren mit traumafokussierter kognitiver Verhaltenstherapie behandelt wurden. Die Ergebnisse zeigten, dass 15,38% der Patienten eine begonnene Behandlung vorzeitig abbrachen. Ferner konnten zwei signifikante Prädiktoren für Dropout ermittelt werden. Die Abbruchrate war bei jüngeren Patienten höher und niedriger bei Patienten, die noch bei ihren Eltern lebten, im Vergleich zu Alleinlebenden. Die

Vorhersageleistung des Regressionsmodells deutet jedoch darauf hin, dass die eingeschlossenen Prädiktoren keine praktisch nutzbare Vorhersageleistung für Dropout treffen können.

Ein umfassendes Verständnis von Behandlungsmisserfolgen erfordert neben der Betrachtung von Dropout eine differenzierte Untersuchung von Non-Response. Obwohl ein erheblicher Anteil der PTBS-Patienten nicht auf evidenzbasierte psychologische Behandlungen anspricht, gibt es derzeit keine umfassende Evidenz zu Prävalenz und Prädiktoren. *Publikation IV* liefert daher die erste Metaanalyse zu Prävalenz und Prädiktoren für Non-Response in leitliniengerechter Behandlung von PTBS. Die Metaanalyse umfasste 86 Studien mit 117 aktiven Behandlungsbedingungen und 7.894 Patienten. Die gewichtete durchschnittliche Non-Response Rate betrug 39,23%, 95% KI [35,08; 43,53]. Non-Response war in der Behandlungsbedingung seltener als in der Kontrollbedingung (*OR* = 0,22). Die Ergebnisse der Prädiktorenanalyse zeigten höhere Non-Response Raten in Zusammenhang mit männlichem Geschlecht, höherem Alter und der Behandlung von Geflüchteten und Veteranen. Darüber hinaus war Non-Response mit einem höheren Schweregrad der PTBS Symptomatik sowie mit dem Vorhandensein und dem Schweregrad einer komorbiden depressiven Störung assoziiert. Signifikante Prädiktoren waren außerdem die Therapierichtung und das Behandlungsformat, mit den niedrigsten Non-Response Raten bei Behandlungen, die Prolonged Exposure (PE) und kognitive Therapie (CT) kombinierten, sowie bei einer Kombination von Einzel- und Gruppentherapie. Schließlich war die Non-Response-Rate in Studien mit ITT-Analyse (Intention-to-Treat) signifikant höher als in Studien mit PP-Analysen (per-Protokoll).

Die Ergebnisse der vier Publikationen leisten einen signifikanten Beitrag zum Verständnis von Therapiemisserfolg, indem sie umfassende Evidenz zu Prävalenz und Prädiktoren für Dropout und Non-Response bei der Behandlung traumatisierter Patienten liefern. Aus den vorliegenden Ergebnissen lassen sich zahlreiche wichtige Implikationen für

die weitere Forschung und die klinische Praxis ableiten. Die Befunde zu Prävalenz von Dropout zeigen, dass entgegen den Erwartungen die Dropoutrate bei Geflüchteten vergleichbar mit westlichen Populationen ist und in ambulanten Behandlungssettings vergleichbar mit RCT-Studiendesigns (Lewis et al., 2020; Swift & Greenberg, 2012). Weitere Forschung ist jedoch notwendig, um die Befunde zu replizieren. In der klinischen Praxis sollte der Häufigkeit von Therapieabbrüchen verstärkt Aufmerksamkeit geschenkt werden. Gleichzeitig zeigen unsere Befunde aber auch, dass psychologische Interventionen zur Behandlung geflüchteter Patienten indiziert zu sein scheinen. Die Befunde zu Prävalenz von Non-Response unterstreichen, dass ein signifikanter Anteil der Patienten nicht von einer leitliniengerechten PTBS Behandlung profitiert. Dies impliziert weiteren Forschungsbedarf zur Reduktion von Non-Response durch eine mögliche Modifikation der leitliniengerechten Therapie oder Überlegungen zu Second-Line Therapieempfehlungen in der klinischen Praxis (Burback et al., 2023).

In Bezug auf die Prädiktoren für Dropout deuten unsere Ergebnisse auf einen möglichen Einfluss einzelner demographischer Variablen (Alter), sowie Geflüchteten- und PTBS-spezifischer Variablen hin. Jedoch konnten nur wenige signifikante Prädiktoren identifiziert werden, was darauf hindeuten könnte, dass Dropout nicht ausreichend durch Variablen erklärt werden kann, die bereits zu Therapiebeginn vorhanden sind. Weitere Forschung ist erforderlich, um ein breiteres Spektrum an Prädiktoren zu untersuchen. Besonderes Augenmerk sollte auf Variablen gelegt werden, die spezifisch für Geflüchtete und PTBS sind (Mitchell et al., 2022). Ferner sollten Prozessvariablen sowie zugrundeliegende Mechanismen untersucht werden (Zandberg et al., 2016). Hinsichtlich der Prädiktoren für Non-Response konnten zahlreiche signifikante Prädiktoren identifiziert werden, die sowohl demographische und klinische Patientenvariablen, als auch Therapiecharakteristika umfassen. Weitere Forschung ist notwendig, um die Befunde zu replizieren, mögliche konfundierende Variablen aufzudecken, sowie Mechanismen und weitere Prädiktorvariablen zu erforschen (Dewar et al., 2020; Fonzo et al., 2020). Die kumulativen Ergebnisse liefern zudem wichtige Indikatoren zur Reduzierung

und Prävention von Dropout und Non-Response in der klinischen Praxis. Bei der Behandlungsplanung und -kontrolle sollte besonderes Augenmerk auf Patienten gelegt werden, bei denen identifizierte Prädiktorvariablen auf ein erhöhtes Risiko für Therapiemisserfolg hinweisen. Es sollten konkrete Maßnahmen zur Prävention von Therapiemisserfolg entwickelt und deren Effektivität geprüft werden. Mögliche Maßnahmen sind eine adäquate Behandlungsvorbereitung unter besonderer Berücksichtigung (kultur-) spezifischer Bedürfnisse einzelner Patientengruppen, die Modifikation leitliniengerechter Behandlungen sowie Empfehlungen für Second-Line Therapieverfahren (Burback et al., 2023; Galovski et al., 2012; Swift & Callahan, 2011).

Schließlich wird in dieser Arbeit die Problematik aufgezeigt, dass es weder für Dropout noch für Non-Response eine einheitliche Definition und Operationalisierung gibt. Dies erschwert nicht nur die Vergleichbarkeit der Ergebnisse und eine metaanalytische Synthese über Studien hinweg, sondern beeinträchtigt auch die Entscheidungsfindung, Behandlungsplanung und Empfehlungen in der klinischen Praxis. Weitere Forschung ist erforderlich, um zu überprüfen, ob die verschiedenen Operationalisierungsmethoden in Bezug auf Dropout das gleiche Konstrukt messen (Larsen et al., 2023). Es ist wichtig zu untersuchen, ob eine Differenzierung zwischen *positivem* und *negativem* Dropout vorgenommen werden sollte. In Bezug auf Non-Response scheint die empirische Validierung vorgeschlagener Operationalisierungsmethoden und die Anpassung der Kriterien für häufig verwendete Messinstrumente von besonderer Bedeutung (Varker et al., 2020). Weitere Fragen beziehen sich auf die Integration funktionaler Maße zur Beurteilung des Behandlungserfolgs (Bonfils et al., 2022).

Zusammenfassend lässt sich festhalten, dass diese Dissertation ein umfassendes Verständnis über die Komplexität von Therapiemisserfolg bei der Behandlung von Menschen mit Traumaerfahrungen vermittelt. Die integrierten Ergebnisse der vier Publikationen liefern nicht dagewesene Erkenntnisse über die Prävalenz und die Prädiktoren von Dropout und Non-

Response bei der Behandlung von PTBS im Allgemeinen sowie in spezifischen Patientengruppen und Behandlungssettings. Entgegen bisheriger Erwartungen deuten die Ergebnisse darauf hin, dass Dropout bei der Behandlung von Geflüchteten und in ambulanten Behandlungssettings vergleichbar mit westlichen Patientengruppen sowie typischen RCT-Studiendesigns ist. Es bedarf jedoch weiterer Forschung, um diese Befunde zu bestätigen. Zudem konnten einzelne Prädiktion von Dropout identifiziert werden, wobei eine relevante Vorhersage von Dropout auf Grundlage von Variablen, die bereits vor Behandlungsbeginn vorhanden waren, weiterhin schwierig zu sein scheint. Auch konnte gezeigt werden, dass ein substantieller Teil der Patienten nicht auf eine leitliniengerechte PTBS Behandlung anspricht. Verschiedene soziodemographische, klinische und therapiebezogene Variablen konnten als Prädiktoren für Non-Response identifiziert werden. Auf lange Sicht liefert diese Dissertation wichtige Implikationen zur Prävention und Reduktion von Therapiemisserfolg in der Behandlung von Menschen mit traumatischen Erfahrungen.

References

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders (5th ed., text rev.)*. https://doi.org/10.1176/appi.books.9780890425787

American Psychological Association. (2017). *Clinical practice guideline for the treatment of posttraumatic stress disorder (PTSD) in adults*. https://www.apa.org/ptsd-guideline/ptsd.pdf

Angelakis, S., & Nixon, R. D. V. (2015). The Comorbidity of PTSD and MDD: Implications for Clinical Practice and Future Research. *Behaviour Change*, *32*(1), 1–25. https://doi.org/DOI: 10.1017/bec.2014.26

Atchley, R., & Bedford, C. (2021). Dissociative Symptoms In Posttraumatic Stress Disorder: A Systematic Review. *Journal of Trauma & Dissociation*, *22*(1), 69–88. https://doi.org/10.1080/15299732.2020.1760410

Baldwin, S. A., Berkeljon, A., Atkins, D. C., Olsen, J. A., & Nielsen, S. L. (2009). Rates of change in naturalistic psychotherapy: contrasting dose-effect and good-enough level models of change. *Journal of Consulting and Clinical Psychology*, *77*(2), 203–211. https://doi.org/10.1037/a0015235

Barawi, K. S., Lewis, C., Simon, N., & Bisson, J. I. (2020). A systematic review of factors associated with outcome of psychological treatments for post-traumatic stress disorder. *European Journal of Psychotraumatology*, *11*(1), 1774240. https://doi.org/10.1080/20008198.2020.1774240

Barkham, M., De Jong, K., Delgadillo, J., & Lutz, W. (2023). Routine Outcome Monitoring (ROM) and Feedback: Research Review and Recommendations. *Psychotherapy Research*, *33*(7), 841–855. https://doi.org/10.1080/10503307.2023.2181114

Barrett, M. S., Chua, W.-J., Crits-Christoph, P., Gibbons, M. B., Casiano, D., & Thompson, D. (2008). Early Withdrawal from mental health treatment: Implications for

psychotherapy practice. *Psychotherapy: Theroy, Research & Practice*, *45*(2), 247–267. https://doi.org/10.1037/0033-3204.45.2.247

Belleau, E. L., Chin, E. G., Wanklyn, S. G., Zambrano-Vazquez, L., Schumacher, J. A., & Coffey, S. F. (2017). Pre-treatment predictors of dropout from prolonged exposure therapy in patients with chronic posttraumatic stress disorder and comorbid substance use disorders. *Behaviour Research and Therapy*, *91*, 43–50. https://doi.org/10.1016/j.brat.2017.01.011

Benjet, C., Bromet, E., Karam, E. G., Kessler, R. C., McLaughlin, K. A., Ruscio, A. M., Shahly, V., Stein, D. J., Petukhova, M., Hill, E., Alonso, J., Atwoli, L., Bunting, B., Bruffaerts, R., Caldas-de-Almeida, J. M., de Girolamo, G., Florescu, S., Gureje, O., Huang, Y., … Koenen, K. C. (2016). The epidemiology of traumatic event exposure worldwide: results from the World Mental Health Survey Consortium. *Psychological Medicine*, *46*(2), 327–343. https://doi.org/10.1017/S0033291715001981

Berk, M., Berk, L., Udina, M., Moylan, S., Stafford, L., Hallam, K., Goldstone, S., & McGorry, P. D. (2012). Palliative models of care for later stages of mental disorder: maximizing recovery, maintaining hope, and building morale. *The Australian and New Zealand Journal of Psychiatry*, *46*(2), 92–99. https://doi.org/10.1177/0004867411432072

Berk, M., & Parker, G. (2009). The Elephant on the Couch: Side-Effects of Psychotherapy. *Australian & New Zealand Journal of Psychiatry*, *43*(9), 787–794. https://doi.org/10.1080/00048670903107559

Bisson, J. I., Ehlers, A., Matthews, R., Pilling, S., Richards, D., & Turner, S. (2007). Psychological treatments for chronic post-traumatic stress disorder. Systematic review and meta-analysis. *The British Journal of Psychiatry : The Journal of Mental Science*, *190*, 97–104. https://doi.org/10.1192/bjp.bp.106.021402

Bjork, T., Bjorck, C., Clinton, D., Sohlberg, S., & Norring, C. (2009). What happened to the

ones who dropped out? Outcome in eating disorder patients who complete or prematurely terminate treatment. *European Eating Disorders Review : The Journal of the Eating Disorders Association*, *17*(2), 109–119. https://doi.org/10.1002/erv.911

Bonanno, G. A., Romero, S. A., & Klein, S. I. (2015). The Temporal Elements of Psychological Resilience: An Integrative Framework for the Study of Individuals, Families, and Communities. *Psychological Inquiry*, *26*(2), 139–169. https://doi.org/10.1080/1047840X.2015.992677

Bonfils, K. A., Tennity, C. L., Congedo, B. A., Dolowich, B. A., Hammer, L. A., & Haas, G. L. (2022). Functional outcomes from psychotherapy for people with posttraumatic stress disorder: A meta-analysis. *Journal of Anxiety Disorders*, *89*, 102576. https://doi.org/10.1016/j.janxdis.2022.102576

Böttche, M., Heeke, C., & Knaevelsrud, C. (2016). Sequenzielle Traumatisierungen, Traumafolgestörungen und psychotherapeutische Behandlungsansätze bei kriegstraumatisierten erwachsenen Flüchtlingen in Deutschland [Sequential traumatizations, trauma sequelae and psychological treatment approaches for war-traumatized adult refugees in Germany]. *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, *59*(5), 621–626. https://doi.org/10.1007/s00103-016-2337-4

Boyd-Franklin, N. (2013). *Black families in therapy: Understanding the African American experience*. Guilford Publications.

Bradley, R., Greene, J., Russ, E., Dutra, L., & Westen, D. (2005). A Multidimensional Meta-Analysis of Psychotherapy for PTSD. *American Journal of Psychiatry*, *162*(2), 214–227. https://doi.org/10.1176/appi.ajp.162.2.214

Breslau, N., Davis, G. C., Peterson, E. L., & Schultz, L. R. (2000). A second look at comorbidity in victims of trauma: the posttraumatic stress disorder–major depression connection. *Biological Psychiatry*, *48*(9), 902–909. https://doi.org/https://doi.org/10.1016/S0006-3223(00)00933-1

Brooks, S. K., & Greenberg, N. (2024). Recurrence of post-traumatic stress disorder: systematic review of definitions, prevalence and predictors. *BMC Psychiatry*, *24*(1), 37. https://doi.org/10.1186/s12888-023-05460-x

Bryant, R. A., Moulds, M. L., Mastrodomenico, J., Hopwood, S., Felmingham, K., & Nixon, R. D. V. (2007). Who drops out of treatment for post-traumatic stress disorder? *Clinical Psychologist*, *11*, 13–15. https://doi.org/10.1080/13284200601178128

Burback, L., Brémault-Phillips, S., Nijdam, M. J., McFarlane, A., & Vermetten, E. (2023). Treatment of Posttraumatic Stress Disorder: a State-of-the-art Review. *Current Neuropharmacology*. *22*(4), 557–635. https://doi.org/10.2174/1570159X21666230428091433

Cahill, S. E., & Foa, E. B. (2004). A Glass Half Empty or Half Full? Where We Are and Directions for Future Research in the Treatment of PTSD. In S. Taylor S. (Ed.), *Advances in the treatment of posttraumatic stress disorder: Cognitive-behavioral perspectives.* (pp. 267–313). Springer Publishing Company.

Chekroud, A. M., Bondar, J., Delgadillo, J., Doherty, G., Wasil, A., Fokkema, M., Cohen, Z., Belgrave, D., DeRubeis, R., Iniesta, R., Dwyer, D., & Choi, K. (2021). The promise of machine learning in predicting treatment outcomes in psychiatry. *World Psychiatry*, *20*(2), 154–170. https://doi.org/https://doi.org/10.1002/wps.20882

Cinkaya, F. (2016). *Die Vielfalt von Abbrüchen in der Psychotherapie. Eine Metaanalyse.[The Multiplicity of Dropouts in Psychotherapy: A Meta-Analysis]*. *Kovac*.

Cloitre, M., Garvert, D. W., & Weiss, B. J. (2017). Depression as a moderator of STAIR Narrative Therapy for women with post-traumatic stress disorder related to childhood abuse. *European Journal of Psychotraumatology*, *8*(1), 1377028. https://doi.org/10.1080/20008198.2017.1377028

Cohen, B. E., Marmar, C. R., Neylan, T. C., Schiller, N. B., Ali, S., & Whooley, M. A. (2009). Posttraumatic Stress Disorder and Health-Related Quality of Life in Patients

With Coronary Heart Disease: Findings From the Heart and Soul Study. *Archives of General Psychiatry*, *66*(11), 1214–1220. https://doi.org/10.1001/archgenpsychiatry.2009.149

Cooper, A. A., Kline, A. C., Graham, B., Bedard-Gilligan, M., Mello, P. G., Feeny, N. C., & Zoellner, L. A. (2017). Homework "Dose," Type, and Helpfulness as Predictors of Clinical Outcomes in Prolonged Exposure for PTSD. *Behavior Therapy*, *48*(2), 182–194. https://doi.org/https://doi.org/10.1016/j.beth.2016.02.013

Coulter, A., & Ellins, J. (2006). *Patient-focused interventions: A review of the evidence*. Quest for Quality and Improved Performance (QQUIP). The Health Foundation.

Cuijpers, P. (2019). Targets and outcomes of psychotherapies for mental disorders: an overview. *World Psychiatry : Official Journal of the World Psychiatric Association (WPA)*, *18*(3), 276–285. https://doi.org/10.1002/wps.20661

Currier, J. M., Holland, J. M., & Drescher, K. D. (2014). Residential Treatment for Combat-Related Posttraumatic Stress Disorder: Identifying Trajectories of Change and Predictors of Treatment Response. *PLOS ONE*, *9*(7), e101741. https://doi.org/10.1371/journal.pone.0101741

Davis, L. L., Schein, J., Cloutier, M., Gagnon-Sanschagrin, P., Maitland, J., Urganus, A., Guerin, A., Lefebvre, P., & Houle, C. R. (2022). The economic burden of posttraumatic stress disorder in the United States from a societal perspective. *The Journal of Clinical Psychiatry*, *83*(3), 40672. https://doi.org/10.4088/JCP.21m14116

De Soet, R., Vermeiren, R. R. J. M., Bansema, C. H., van Ewijk, H., Nijland, L., & Nooteboom, L. A. (2023). Drop-out and ineffective treatment in youth with severe and enduring mental health problems: a systematic review. *European Child & Adolescent Psychiatry*. https://doi.org/10.1007/s00787-023-02182-z

Deisenhofer, A.-K., Delgadillo, J., Rubel, J. A., Böhnke, J. R., Zimmermann, D., Schwartz, B., & Lutz, W. (2018). Individual treatment selection for patients with posttraumatic

stress disorder. *Depression and Anxiety*, *35*(6), 541–550. https://doi.org/https://doi.org/10.1002/da.22755

DeRubeis, R. J., Cohen, Z. D., Forand, N. R., Fournier, J. C., Gelfand, L. A., & Lorenzo-Luaces, L. (2014). The Personalized Advantage Index: translating research on prediction into individualized treatment recommendations. A demonstration. *PloS One*, *9*(1), e83875. https://doi.org/10.1371/journal.pone.0083875

Dewar, M., Paradis, A., & Fortin, C. A. (2020). Identifying Trajectories and Predictors of Response to Psychotherapy for Post-Traumatic Stress Disorder in Adults: A Systematic Review of Literature. *Canadian Journal of Psychiatry. Revue Canadienne de Psychiatrie*, *65*(2), 71–86. https://doi.org/10.1177/0706743719875602

Edwards-Stewart, A., Smolenski, D. J., Bush, N. E., Cyr, B.-A., Beech, E. H., Skopp, N. A., & Belsher, B. E. (2021). Posttraumatic Stress Disorder Treatment Dropout Among Military and Veteran Populations: A Systematic Review and Meta-Analysis. *Journal of Traumatic Stress*, *34*(4), 808–818. https://doi.org/10.1002/jts.22653

Egger, M., Smith, G. D., & Sterne, J. A. C. (2001). Uses and abuses of meta-analysis. *Clinical Medicine*, *1*(6), 478 LP – 484. https://doi.org/10.7861/clinmedicine.1-6-478

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319–345. https://doi.org/10.1016/s0005-7967(99)00123-0

Ehlers, A., Grey, N., Wild, J., Stott, R., Liness, S., Deale, A., Handley, R., Albert, I., Cullen, D., Hackmann, A., Manley, J., McManus, F., Brady, F., Salkovskis, P., & Clark, D. M. (2013). Implementation of Cognitive Therapy for PTSD in routine clinical care: Effectiveness and moderators of outcome in a consecutive sample. *Behaviour Research and Therapy*, *51*(11), 742–752. https://doi.org/https://doi.org/10.1016/j.brat.2013.08.006

Ehring, T., Limburg, K., Kunze, A. E., Wittekind, C. E., Werner, G. G., Wolkenstein, L., Guzey, M., & Cludius, B. (2022). (When and how) does basic research in clinical

psychology lead to more effective psychological treatment for mental disorders? *Clinical Psychology Review*, *95*, 102163. https://doi.org/10.1016/j.cpr.2022.102163

Erbes, C. R., Kaler, M. E., Schult, T., Polusny, M. A., & Arbisi, P. A. (2011). Mental health diagnosis and occupational functioning in National Guard/Reserve veterans returning from Iraq. *Journal of Rehabilitation Research and Development*, *48*(10), 1159–1170. https://doi.org/10.1682/jrrd.2010.11.0212

Eskreis-Winkler, L., & Fishbach, A. (2019). Not Learning From Failure-the Greatest Failure of All. *Psychological Science*, *30*(12), 1733–1744. https://doi.org/10.1177/0956797619881133

Falkenström, F., Josefsson, A., Berggren, T., & Holmqvist, R. (2016). How much therapy is enough? Comparing dose-effect and good-enough models in two different settings. *Psychotherapy*. *53*(1), 130-139. https://doi.org/10.1037/pst0000039

Farber, B. A. (1983). Psychotherapists' perceptions of stressful patient behavior. *Professional Psychology: Research and Practice*, *14*(5), 697–705. https://doi.org/10.1037/0735-7028.14.5.697

Fazel, M., Wheeler, J., & Danesh, J. (2005). Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *Lancet*, *365*(9467), 1309–1314. https://doi.org/10.1016/S0140-6736(05)61027-6

Feeny, N. C., Zoellner, L. A., & Foa, E. B. (2002). Treatment outcome for chronic PTSD among female assault victims with borderline personality characteristics: a preliminary examination. *Journal of Personality Disorders*, *16*(1), 30–40. https://doi.org/10.1521/pedi.16.1.30.22555

Fletcher, S., Elklit, A., Shevlin, M., & Armour, C. (2017). Predictors of PTSD Treatment Response Trajectories in a Sample of Childhood Sexual Abuse Survivors: The Roles of Social Support, Coping, and PTSD Symptom Clusters. *Journal of Interpersonal Violence*, *36*(3–4), 1283–1307.

https://doi.org/10.1177/0886260517741212

Foa, E. B., Zoellner, L. A., Feeny, N. C., Hembree, E. A., & Alvarez-Conrad, J. (2002). Does imaginal exposure exacerbate PTSD symptoms? *Journal of Consulting and Clinical Psychology*, *70*(4), 1022–1028. American Psychological Association. https://doi.org/10.1037/0022-006X.70.4.1022

Fonzo, G. A., Federchenco, V., & Lara, A. (2020). Predicting and Managing Treatment Non-Response in Posttraumatic Stress Disorder. *Current Treatment Options in Psychiatry*, *7*(2), 70–87. https://doi.org/10.1007/s40501-020-00203-1

Frank, E., Prien, R. F., Jarrett, R. B., Keller, M. B., Kupfer, D. J., Lavori, P. W., Rush, A. J., & Weissman, M. M. (1991). Conceptualization and rationale for consensus definitions of terms in major depressive disorder. Remission, recovery, relapse, and recurrence. *Archives of General Psychiatry*, *48*(9), 851–855. https://doi.org/10.1001/archpsyc.1991.01810330075011

Galovski, T. E., Blain, L. M., Mott, J. M., Elwood, L., & Houle, T. (2012). Manualized therapy for PTSD: Flexing the structure of cognitive processing therapy. *Journal of Consulting and Clinical Psychology*, *80*(6), 968–981. https://doi.org/10.1037/A0030600

Garcia, H. A., Kelley, L. P., Rentz, T. O., & Lee, S. (2011). Pretreatment predictors of dropout from cognitive behavioral therapy for PTSD in Iraq and Afghanistan war veterans. *Psychological Services*, *8*, 1–11. https://doi.org/10.1037/a0022705

Garfield, S. L. (1994). Research on client variables in psychotherapy. In S.L. Garfiled & A.E. Bergin (Eds.), *Handbook of psychotherapy and behavior change.* (4th ed., pp. 190–228). John Wiley & Sons.

Gilmore, A. K., Lopez, C., Muzzy, W., Brown, W. J., Grubaugh, A., Oesterle, D. W., & Acierno, R. (2020). Emotion Dysregulation Predicts Dropout from Prolonged Exposure Treatment among Women Veterans with Military Sexual Trauma-Related Posttraumatic Stress Disorder. *Women's Health Issues : Official Publication of the Jacobs Institute of*

Women's Health, *30*(6), 462–469. https://doi.org/10.1016/j.whi.2020.07.004

Gloster, A. T., Rinner, M. T. B., Ioannou, M., Villanueva, J., Block, V. J., Ferrari, G., Benoy, C., Bader, K., & Karekla, M. (2020). Treating treatment non-responders: A meta-analysis of randomized controlled psychotherapy trials. *Clinical Psychology Review*, *75*, 101810. https://doi.org/https://doi.org/10.1016/j.cpr.2019.101810

Goetter, E. M., Bui, E., Ojserkis, R. A., Zakarian, R. J., Brendel, R. W., & Simon, N. M. (2015). A Systematic Review of Dropout From Psychotherapy for Posttraumatic Stress Disorder Among Iraq and Afghanistan Combat Veterans. *Journal of Traumatic Stress*, *28*(5), 401–409. https://doi.org/10.1002/jts.22038

Goodson, J. T., Helstrom, A. W., Marino, E. J., & Smith, R. V. (2017). The impact of service-connected disability and therapist experience on outcomes from prolonged exposure therapy with veterans. *Psychological Trauma: Theory, Research, Practice, and Policy*, *9*(6), 647. https://doi.org/10.1037/tra0000260

Greden, J. F. (2001). The burden of disease for treatment-resistant depression. *The Journal of Clinical Psychiatry*, *62*(Suppl 16), 26–31.

Gutner, C. A., Gallagher, M. W., Baker, A. S., Sloan, D. M., & Resick, P. A. (2016). Time course of treatment dropout in cognitive–behavioral therapies for posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(1), 115. https://doi.org/10.1037/tra0000062

Hagenaars, M. A., van Minnen, A., & Hoogduin, K. A. L. (2010). The impact of dissociation and depression on the efficacy of prolonged exposure treatment for PTSD. *Behaviour Research and Therapy*, *48*(1), 19–27. https://doi.org/10.1016/j.brat.2009.09.001

Handiso, D., Belsti, Y., Boyle, J. A., Paul, E., Shawyer, F., & Enticott, J. C. (2023). A Systematic Review and Meta-Analysis of Longitudinal Studies on Posttraumatic Stress Disorders in Refugees and Asylum Seekers. *International Journal of Mental Health and*

Addiction. https://doi.org/10.1007/s11469-023-01172-1

Hargreaves, S. (2002). A body of evidence: torture among asylum seekers to the West. *Lancet*, *359*(9308), 793–794. https://doi.org/10.1016/S0140-6736(02)07888-1

Hatchett, G. T., & Park, H. L. (2003). Comparison of Four Operational Definitions of Premature Termination. *Psychotherapy: Theory, Research, Practice, Training*, *40(*3). 226-231. https://doi.org/10.1037/0033-3204.40.3.226

Hembree, E. A., Foa, E. B., Dorfan, N. M., Street, G. P., Kowalski, J., & Tu, X. (2003). Do patients drop out prematurely from exposure therapy for PTSD? *Journal of Traumatic Stress*, *16*(6), 555–562. https://doi.org/https://doi.org/10.1023/B:JOTS.0000004078.93012.7d

Herzog, P., & Kaiser, T. (2022). Is it worth it to personalize the treatment of PTSD?—A variance-ratio meta-analysis and estimation of treatment effect heterogeneity in RCTs of PTSD. *Journal of Anxiety Disorders*, *91*, 1–7. https://doi.org/10.1016/j.janxdis.2022.102611

Hill, C. E., & Lambert, M. J. (2004). Methodological issues in studying psychotherapy processes and outcomes. In M.J. Lambert (Ed.), *Bergin and Garfield's Handbook of Psychotherapy and Behavior Change* (pp. 84–135). John Wiley & Sons.

Hinton, D. E., Hofmann, S. G., Pollack, M. H., & Otto, M. W. (2009). Mechanisms of efficacy of CBT for Cambodian refugees with PTSD: improvement in emotion regulation and orthostatic blood pressure response. *CNS Neuroscience & Therapeutics*, *15*(3), 255–263. https://doi.org/10.1111/j.1755-5949.2009.00100.x

Hinton, E., Steel, Z., Hilbrink, D., & Berle, D. (2022). Anger and predictors of drop-out from PTSD treatment of veterans and first responders. *Behavioural and Cognitive Psychotherapy*, *50*(2), 237–251. https://doi.org/10.1017/S1352465821000382

Holliday, R., Holder, N., Monteith, L. L., & Surís, A. (2018). Decreases in Suicide Cognitions After Cognitive Processing Therapy Among Veterans With Posttraumatic Stress

Disorder Due to Military Sexual Trauma: A Preliminary Examination. *The Journal of Nervous and Mental Disease*, *206*(7). https://doi.org/10.1097/NMD.0000000000000840

Hoppen, T. H., Jehn, M., Holling, H., Mutz, J., Kip, A., Morina, N., Bisson, J. I., & Olff, M. (2023). The efficacy and acceptability of psychological interventions for adult PTSD: A network and pairwise meta-analysis of randomized controlled trials. *Journal of Consulting and Clinical Psychology*, *91*(8), 445–461. https://doi.org/10.1037/ccp0000809

Hoppen, T. H., Kip, A., & Morina, N. (2023). Are psychological interventions for adult PTSD more efficacious and acceptable when treatment is delivered in higher frequency? A meta-analysis of randomized controlled trials. *Journal of Anxiety Disorders*, *95*, 102684. https://doi.org/https://doi.org/10.1016/j.janxdis.2023.102684

Howard, K. I., Kopta, S. M., Krause, M. S., & Orlinsky, D. E. (1986). The dose–effect relationship in psychotherapy. *American Psychologist*, *41*(2), 159–164. https://doi.org/10.1037/0003-066X.41.2.159

Husen, K., Rafaeli, E., Rubel, J. A., Bar-Kalifa, E., & Lutz, W. (2016). Daily affect dynamics predict early response in CBT: Feasibility and predictive validity of EMA for outpatient psychotherapy. *Journal of Affective Disorders*, *206*, 305–314. https://doi.org/10.1016/j.jad.2016.08.025

Imel, Z. E., Laska, K., Jakupcak, M., & Simpson, T. L. (2013). Meta-Analysis of Dropout in Treatments for Posttraumatic Stress Disorder. *Jounral of Consulting and Clinical Psychology*, *81*(3), 394–404. https://doi.org/10.1037/a0031474

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59(1) https://doi.org/10.1037/0022-006X.59.1.12

Jaycox, L. H., Foa, E. B., & Morral, A. R. (1998). Influence of emotional engagement and

habituation on exposure therapy for PTSD. *Journal of Consulting and Clinical Psychology*, *66*(1), 185–192. https://doi.org/10.1037//0022-006x.66.1.185

Jericho, B., Luo, A., & Berle, D. (2022). Trauma-focused psychotherapies for post-traumatic stress disorder: A systematic review and network meta-analysis. *Acta Psychiatrica Scandinavica*, *145*(2), 132–155. https://doi.org/10.1111/acps.13366

Jinkerson, J. (2016). Defining and Assessing Moral Injury: A Syndrome Perspective. *Traumatology*, *22*. https://doi.org/10.1037/trm0000069

Kalt, A., Hossain, M., Kiss, L., & Zimmerman, C. (2013). Asylum seekers, violence and health: a systematic review of research in high-income host countries. *American Journal of Public Health*, *103*(3), e30-42. https://doi.org/10.2105/AJPH.2012.301136

Kip, A., Priebe, S., Holling, H., & Morina, N. (2020). Psychological interventions for posttraumatic stress disorder and depression in refugees: A meta-analysis of randomized controlled trials. *Clinical Psychology & Psychotherapy*, *27*(4):489-503. https://doi.org/10.1002/cpp.2446

Klaeth, J. R., Jensen, A. G., Auren, T. J. B., & Solem, S. (2024). 12-month follow-up of intensive outpatient treatment for PTSD combining prolonged exposure therapy, EMDR and physical activity. *BMC Psychiatry*, *24*(1), 225. https://doi.org/10.1186/s12888-024-05656-9

Kline, A. C., Cooper, A. A., Rytwinksi, N. K., & Feeny, N. C. (2018). Long-term efficacy of psychotherapy for posttraumatic stress disorder: A meta-analysis of randomized controlled trials. *Clinical Psychology Review*, *59*, 30–40. https://doi.org/10.1016/j.cpr.2017.10.009

Kline, A. C., Cooper, A. A., Rytwinski, N. K., & Feeny, N. C. (2021). The Effect of Concurrent Depression on PTSD Outcomes in Trauma-Focused Psychotherapy: A Meta-Analysis of Randomized Controlled Trials. *Behavior Therapy*, *52*(1), 250–266. https://doi.org/10.1016/j.beth.2020.04.015

Koek, R. J., Schwartz, H. N., Scully, S., Langevin, J.-P., Spangler, S., Korotinsky, A., Jou, K., & Leuchter, A. (2016). Treatment-refractory posttraumatic stress disorder (TRPTSD): a review and framework for the future. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *70*, 170–218. https://doi.org/https://doi.org/10.1016/j.pnpbp.2016.01.015

Koenen, K. C., Stellman, S. D., Sommer Jr., J. F., & Stellman, J. M. (2008). Persisting posttraumatic stress disorder symptoms and their relationship to functioning in Vietnam veterans: A 14-year follow-up. *Journal of Traumatic Stress*, *21*(1), 49–57. https://doi.org/https://doi.org/10.1002/jts.20304

Lam, R. W., Parikh, S. V, Michalak, E. E., Dewa, C. S., & Kennedy, S. H. (2015). Canadian Network for Mood and Anxiety Treatments (CANMAT) consensus recommendations for functional outcomes in major depressive disorder. *Annals of Clinical Psychiatry : Official Journal of the American Academy of Clinical Psychiatrists*, *27*(2), 142–149.

Lambert, M. J. (2011). What have we learned about treatment failure in empirically supported treatments? Some suggestions for practice. *Cognitive and Behavioral Practice*, *18*(3), 413–420. https://doi.org/10.1016/j.cbpra.2011.02.002

Lampropoulos, G. K. (2010). Type of counseling termination and trainee therapist-client agreement about change. *Counselling Psychology Quarterly*, *23*(1), 111–120. https://doi.org/10.1080/09515071003721552

Larsen, S. E., Fleming, C. J. E., & Resick, P. A. (2019). Residual symptoms following empirically supported treatment for PTSD. *Psychological Trauma : Theory, Research, Practice and Policy*, *11*(2), 207–215. https://doi.org/10.1037/tra0000384

Larsen, S. E., Hamrick, L. A., Thomas, K. B., Hessinger, J. D., Melka, S. E., Khaled, M., Hove, M. C., & Maieritsch, K. (2023). Symptom change prior to treatment discontinuation (dropout) from a naturalistic Veterans Affairs evidence-based psychotherapy clinic for PTSD and depression. *Psychological Services*, *20*(4), 831–838.

https://doi.org/10.1037/ser0000757

Larsen, S. E., Sippel, L. M., & Schnurr, P. P. (2020). Let's all get on the same page: A commentary on "Defining response and nonresponse to PTSD treatments: A systematic review". *Clinical Psychology: Science and Practice, 27(4)*. https://doi.org/10.1111/cpsp.12364

Leichsenring, F. (2004). Randomized controlled versus naturalistic studies: A new research agenda. *Bulletin of the Menninger Clinic*, *68*(2), 137–151. https://doi.org/10.1521/bumc.68.2.137.35952

Lewis, C., Roberts, N. P., Gibson, S., & Bisson, J. I. (2020). Dropout from psychological therapies for post-traumatic stress disorder (PTSD) in adults: systematic review and meta-analysis. *European Journal of Psychotraumatology*, *11*(1), 1709709. https://doi.org/10.1080/20008198.2019.1709709

Liedl, A., Böttche, M., Abdallah-Steinkopff, B., & Knaevelsrud, C. (2016). *Psychotherapie mit Flüchtlingen-neue Herausforderungen, spezifische Bedürfnisse: Das Praxisbuch für Psychotherapeuten und Ärzte. [Psychotherapy with refugees- new challenges, specific needs: The practice book for psychotherapists and doctors]*. Schattauer Verlag.

Lutz, W., de Jong, K., Rubel, J., & Delgadillo, J. (2021). Measuring, predicting, and tracking change in psychotherapy. In M. Barkham, W. Lutz, & L. G. Castonguay (Eds.), *Bergin and Garfield's handbook of psychotherapy and behavior change: 50th anniversary edition* (7th ed., pp. 89–133). John Wiley & Sons.

Lutz, W., Martinovich, Z., & Howard, K. I. (1999). Patient profiling: An application of random coefficient regression models to depicting the response of a patient to outpatient psychotherapy. *Journal of Consulting and Clinical Psychology*, 67(4) https://doi.org/10.1037/0022-006X.67.4.571

Lutz, W., Schwartz, B., Hofmann, S. G., Fisher, A. J., Husen, K., & Rubel, J. A. (2018). Using network analysis for the prediction of treatment dropout in patients with mood and

anxiety disorders: A methodological proof-of-concept study. *Scientific Reports*, *8*(1), 7819. https://doi.org/10.1038/s41598-018-25953-0

Magruder, K. M., Frueh, B. C., Knapp, R. G., Davis, L., Hamner, M. B., Martin, R. H., Gold, P. B., & Arana, G. W. (2005). Prevalence of posttraumatic stress disorder in Veterans Affairs primary care clinics. *General Hospital Psychiatry*, *27*(3), 169–179. https://doi.org/https://doi.org/10.1016/j.genhosppsych.2004.11.001

Martin, A., Naunton, M., Kosari, S., Peterson, G., Thomas, J., & Christenson, J. K. (2021). Treatment Guidelines for PTSD: A Systematic Review. *Journal of Clinical Medicine*, *10*(18). https://doi.org/10.3390/jcm10184175

Mauskopf, J. A., Simon, G. E., Kalsekar, A., Nimsch, C., Dunayevich, E., & Cameron, A. (2009). Nonresponse, partial response, and failure to achieve remission: humanistic and cost burden in major depressive disorder. *Depression and Anxiety*, *26*(1), 83–97. https://doi.org/https://doi.org/10.1002/da.20505

Maxwell, J. C. (2000). Failing Forward–Turning Your Mistakes into Stepping Stones for Success. In *Thomas Nelson*.

McLean, C. P., Levy, H. C., Miller, M. L., & Tolin, D. F. (2022). Exposure therapy for PTSD in military populations: A systematic review and meta-analysis of randomized clinical trials. *Journal of Anxiety Disorders*, *90*, 102607. https://doi.org/https://doi.org/10.1016/j.janxdis.2022.102607

Miles, S. R., & Thompson, K. E. (2016). Childhood trauma and posttraumatic stress disorder in a real-world Veterans Affairs clinic: Examining treatment preferences and dropout. *Psychological Trauma : Theory, Research, Practice and Policy*, *8*(4), 464–467. https://doi.org/10.1037/tra0000132

Mills, K. L., Teesson, M., Ross, J., & Peters, L. (2006). Trauma, PTSD, and Substance Use Disorders: Findings From the Australian National Survey of Mental Health and Well-Being. *American Journal of Psychiatry*, *163*(4), 652–658.

https://doi.org/10.1176/ajp.2006.163.4.652

Mitchell, S., Mitchell, R., Shannon, C., Dorahy, M., & Hanna, D. (2022). Effects of baseline psychological symptom severity on dropout from trauma-focused cognitive behavior therapy for posttraumatic stress disorder: A meta-analysis. *Traumatology*. *29*(2), 112–124. https://doi.org/10.1037/trm0000404

Morina, N., Wicherts, J. M., Lobbrecht, J., & Priebe, S. (2014). Remission from post-traumatic stress disorder in adults: a systematic review and meta-analysis of long term outcome studies. *Clinical Psychology Review*, *34*(3), 249–255. https://doi.org/10.1016/j.cpr.2014.03.002

Mrazek, D. A., Hornberger, J. C., Altar, C. A., & Degtiar, I. (2014). A review of the clinical, economic, and societal burden of treatment-resistant depression: 1996-2013. *Psychiatric Services*, *65*(8), 977–987. https://doi.org/10.1176/appi.ps.201300059

Neuner, F., Schauer, M., Klaschik, C., Karunakara, U., & Elbert, T. (2004). A comparison of narrative exposure therapy, supportive counseling, and psychoeducation for treating posttraumatic stress disorder in an african refugee settlement. *Journal of Consulting and Clinical Psychology*, *72*(4), 579–587. https://doi.org/10.1037/0022-006X.72.4.579

Nickerson, A., Bryant, R. A., Silove, D., & Steel, Z. (2011). A critical review of psychological treatments of posttraumatic stress disorder in refugees. C*linical Psychology Review*, *31*(3), 399–417. https://doi.org/10.1016/j.cpr.2010.10.004

Nijdam, M., Vries, G.-J., Gersons, B., & Olff, M. (2015). Response to Psychotherapy for Posttraumatic Stress Disorder: The Role of Pretreatment Verbal Memory Performance. *The Journal of Clinical Psychiatry*, *76*, e1023–e1028. https://doi.org/10.4088/JCP.14m09438

Norman, S. B., Stein, M. B., & Davidson, J. R. T. (2007). Profiling Posttraumatic Functional Impairment. *The Journal of Nervous and Mental Disease*, *195*(1). https://journals.lww.com/jonmd/fulltext/2007/01000/profiling_posttraumatic_functional_

impairment.8.aspx

Nose, M., Ballette, F., Bighelli, I., Turrini, G., Purgato, M., Tol, W., Priebe, S., & Barbui, C. (2017). Psychosocial interventions for post-traumatic stress disorder in refugees and asylum seekers resettled in high-income countries: Systematic review and meta-analysis. *PLOS ONE*, *12*(2). https://doi.org/10.1371/journal.pone.0171030

O'Keeffe, S., Martin, P., Target, M., & Midgley, N. (2019). 'I Just Stopped Going': A Mixed Methods Investigation Into Types of Therapy Dropout in Adolescents With Depression. *Frontiers in Psychology, 10, 75.* https://www.frontiersin.org/article/10.3389/fpsyg.2019.00075

Oasi, O., & Werbart, A. (2020). Editorial: Unsuccessful Psychotherapies: When and How Do Treatments Fail? *Frontiers in Psychology,* 11. https://doi.org/10.3389/fpsyg.2020.578997

Ogrodniczuk, J. S., Joyce, A. S., & Piper, W. E. (2005). Strategies for Reducing Patient-Initiated Premature Termination of Psychotherapy. *Harvard Review of Psychiatry*, *13*(2), 57–70. https://doi.org/10.1080/10673220590956429

Pacella, M. L., Hruska, B., & Delahanty, D. L. (2013). The physical health consequences of PTSD and PTSD symptoms: A meta-analytic review. *Journal of Anxiety Disorders*, *27*(1), 33–46. https://doi.org/https://doi.org/10.1016/j.janxdis.2012.08.004

Paiva, J., Melani, M., Gonçalves, R. M., Luz, M. P., Mendlowicz, M. V., Figueira, I., von Arcosy, C., Ventura, P., & Berger, W. (2022). Predictors of response to cognitive-behavioral therapy in patients with posttraumatic stress disorder: A systematic review. *Jornal Brasileiro de Psiquiatria*, *71*(2), 149–160. https://doi.org/10.1590/0047-2085000000375

Pallanti, S., Hollander, E., Bienstock, C., Koran, L., Leckman, J., Marazziti, D., Pato, M., Stein, D., Zohar, J., Frank, E., Prien, R. F., Jarrett, R. B., Keller, M. B., Kupfer, D. J., Lavori, P. W., Rush, A. J., & Weissman, M. M. (1991). Treatment non-response in

OCD: methodological issues and operational definitions. *Archives of General Psychiatry*, *48*(2), 181–191. https://doi.org/10.1017/S1461145702002900

Panagioti, M., Gooding, P. A., & Tarrier, N. (2012). A meta-analysis of the association between posttraumatic stress disorder and suicidality: the role of comorbid depression. *Comprehensive Psychiatry*, *53*(7), 915–930. https://doi.org/https://doi.org/10.1016/j.comppsych.2012.02.009

Pineles, S. L., Mostoufi, S. M., Ready, C. B., Street, A. E., Griffin, M. G., & Resick, P. A. (2011). Trauma reactivity, avoidant coping, and PTSD symptoms: A moderating relationship? *Journal of Abnormal Psychology*, *120*(1), 240–246. https://doi.org/10.1037/a0022123

Piselli, A., Halgin, R., & MacEwan, G. (2011). What went wrong? Therapists' reflections on their role in premature termination. *Psychotherapy Research*, *21*(4), 400–415. http://10.0.4.56/10503307.2011.573819

Priebe, S., Giacco, D., & El-Nagib, R. (2016). *Public health aspects of mental health among migrants and refugees: a review of the evidence on mental health care for refugees, asylum seekers and irregular migrants in the WHO European Region*. World Health Organization. Regional Office for Europe.

Renner, W., Bänninger-Huber, E., & Peltzer, K. (2011). Culture-Sensitive and Resource Oriented Peer (CROP)-Groups as a community based intervention for trauma survivors: A randomized controlled pilot study with refugees and asylum seekers from Chechnya. *Australasian Journal of Disaster and Trauma Studies*, *2011*(1), 1–13. http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2011-23793-006&site=ehost-live

Rizvi, S. L., Vogt, D. S., & Resick, P. A. (2009). Cognitive and affective predictors of treatment outcome in Cognitive Processing Therapy and Prolonged Exposure for posttraumatic stress disorder. *Behaviour Research and Therapy*, *47*(9), 737–743.

https://doi.org/10.1016/j.brat.2009.06.003

Roberts, N. P., Lotzin, A., & Schäfer, I. (2022). A systematic review and meta-analysis of psychological interventions for comorbid post-traumatic stress disorder and substance use disorder. *European Journal of Psychotraumatology*, *13*(1), 2041831. https://doi.org/10.1080/20008198.2022.2041831

Ronconi, J. M., Shiner, B., & Watts, B. V. (2015). A Meta-Analysis of Depressive Symptom Outcomes in Randomized, Controlled Trials for PTSD. *The Journal of Nervous and Mental Disease*, *203*(7), 522–529. https://doi.org/10.1097/NMD.0000000000000322

Roos, J., & Werbart, A. (2013). Therapist and relationship factors influencing dropout from individual psychotherapy: a literature review. *Psychotherapy Research : Journal of the Society for Psychotherapy Research*, *23*(4), 394–418. https://doi.org/10.1080/10503307.2013.775528

Schottenbauer, M. A., Glass, C. R., Arnkoff, D. B., Tendick, V., & Gray, S. H. (2008). Nonresponse and dropout rates in outcome studies on PTSD: review and methodological considerations. *Psychiatry*, *71*(2), 134–168. https://doi.org/10.1521/PSYC.2008.71.2.134

Semmlinger, V., & Ehring, T. (2021). Predicting and preventing dropout in research, assessment and treatment with refugees. *Clinical Psychology & Psychotherapy*, *29*(3), 767-782. https://doi.org/https://doi.org/10.1002/cpp.2672

Sharf, J., Primavera, L. H., & Diener, M. J. (2010). Dropout and therapeutic alliance: A meta-analysis of adult individual psychotherapy. *Psychotherapy: Theory, Research, Practice, Training*, *47*(4), 637–645. https://doi.org/10.1037/a0021175

Shnaider, P., Boyd, J. E., Cameron, D. H., & McCabe, R. E. (2022). The relationship between emotion regulation difficulties and PTSD outcomes during group cognitive processing therapy for PTSD. *Psychological Services*, *19*(4), 751–759. https://doi.org/10.1037/ser0000546

Sippel, L. M., Holtzheimer, P. E., Friedman, M. J., & Schnurr, P. P. (2018). Defining

Treatment-Resistant Posttraumatic Stress Disorder: A Framework for Future Research. *Biological psychiatry*, *84*(5), e37–e41. https://doi.org/10.1016/j.biopsych.2018.03.011

Slobodin, O., & de Jong, J. T. V. M. (2015). Mental health interventions for traumatized asylum seekers and refugees: What do we know about their efficacy? *International Journal of Social Psychiatry, 61*(1), 17–26. https://doi.org/10.1177/0020764014535752

Smith-Apeldoorn, S. Y., Veraart, J. K. E., & Schoevers, R. A. (2019). Definition and Epidemiology of Treatment Resistance in Psychiatry BT - Treatment Resistance in Psychiatry: Risk Factors, Biology, and Management. In K. Yong-Ku (Ed), *Treatment Resistance in Psychiatry. Risk Factors, Biology, and Management*, (pp. 3–24). Springer https://doi.org/10.1007/978-981-10-4358-1_1

Snoek, A., Nederstigt, J., Ciharova, M., Sijbrandij, M., Lok, A., Cuijpers, P., & Thomaes, K. (2021). Impact of comorbid personality disorders on psychotherapy for post-traumatic stress disorder: systematic review and meta-analysis. *European Journal of Psychotraumatology*, *12*(1), 1929753. https://doi.org/10.1080/20008198.2021.1929753

Sripada, R. K., Pfeiffer, P. N., Rampton, J., Ganoczy, D., Rauch, S. A. M., Polusny, M. A., & Bohnert, K. M. (2017). Predictors of PTSD Symptom Change Among Outpatients in the U.S. Department of Veterans Affairs Health Care System. *Journal of Traumatic Stress*, *30*(1), 45–53. https://doi.org/https://doi.org/10.1002/jts.22156

Steel, Z., Chey, T., Silove, D., Marnane, C., Bryant, R. A., & van Ommeren, M. (2009). Association of torture and other potentially traumatic events with mental health outcomes among populations exposed to mass conflict and displacement: a systematic review and meta-analysis. *JAMA*, *302*(5), 537–549. https://doi.org/10.1001/jama.2009.1132

Steenkamp, M. M., Litz, B. T., Hoge, C. W., & Marmar, C. R. (2015). Psychotherapy for Military-Related PTSD: A Review of Randomized Clinical Trials. *JAMA*, *314*(5), 489–

500. https://doi.org/10.1001/jama.2015.8370

Stirman, S. W., Gutner, C. A., Suvak, M. K., Adler, A., Calloway, A., & Resick, P. (2018). Homework Completion, Patient Characteristics, and Symptom Change in Cognitive Processing Therapy for PTSD. *Behavior Therapy*, *49*(5), 741–755. https://doi.org/https://doi.org/10.1016/j.beth.2017.12.001

Straud, C. L., Siev, J., Messer, S., & Zalta, A. K. (2019). Examining military population and trauma type as moderators of treatment outcome for first-line psychotherapies for PTSD: A meta-analysis. *Journal of Anxiety Disorders*, *67*, 102133. https://doi.org/10.1016/j.janxdis.2019.102133

Swift, J. K., Greenberg, R. P., Whipple, J., & Kominiak, N. (2012). Practice Recommendations for Reducing Premature Termination in Therapy. *Professional Psychology: Research and Practice*, *43*, 379–387. https://doi.org/10.1037/a0028291

Swift, J. K., & Callahan, J. L. (2011). Decreasing treatment dropout by addressing expectations for treatment length. *Psychotherapy Research*, *21*(2), 193–200. https://doi.org/10.1080/10503307.2010.541294

Swift, J. K., Callahan, J., & Levine, J. C. (2009). Using clinically significant change to identify premature termination. *Psychotherapy*, *46*(3), 328–335. https://doi.org/10.1037/a0017003

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: a meta-analysis. *Journal of Consulting and Clinical Psychology*, *80*(4), 547–559. https://doi.org/10.1037/a0028226

Swift, J. K., & Greenberg, R. P. (2014). A treatment by disorder meta-analysis of dropout from psychotherapy. *Journal of Psychotherapy Integration*, *24*(3), 193. https://doi.org/10.1037/a0037512

Taylor, S., Abramowitz, J. S., & McKay, D. (2012). Non-adherence and non-response in the treatment of anxiety disorders. *Journal of Anxiety Disorders*, *26*(5), 583–589.

https://doi.org/10.1016/j.janxdis.2012.02.010

Thompson, C. T., Vidgen, A., & Roberts, N. P. (2018). Psychological interventions for post-traumatic stress disorder in refugees and asylum seekers: A systematic review and meta-analysis. C*linical Psychology Review*, *63*, 66–79. https://doi.org/10.1016/j.cpr.2018.06.006

Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: A quantitative review of 25 years of research. *Psychological Bulletin*, 132(6), 959–992. https://doi.org/10.1037/0033-2909.132.6.959

Turrini, G., Purgato, M., Acarturk, C., Anttila, M., Au, T., Ballette, F., Bird, M., Carswell, K., Churchill, R., Cuijpers, P., Hall, J., Hansen, L. J., Kösters, M., Lantta, T., Nosè, M., Ostuzzi, G., Sijbrandij, M., Tedeschi, F., Valimaki, M., … Barbui, C. (2019). Efficacy and acceptability of psychosocial interventions in asylum seekers and refugees: Systematic review and meta-analysis. *Epidemiology and Psychiatric Sciences*, *28*(4), 376–388. https://doi.org/10.1017/S2045796019000027

United Nation High Commissioner for Refugees. (2023). *Global Trends. Forced Displacement in 2022*. https://www.unhcr.org/global-trends-report-2022

Van Dijk, D. A., Meijer, R. M., van den Boogaard, T. M., Spijker, J., Ruhé, H. G., & Peeters, F. P. M. L. (2023). Worse off by waiting for treatment? The impact of waiting time on clinical course and treatment outcome for depression in routine care. *Journal of Affective Disorders*, *322*, 205–211. https://doi.org/10.1016/j.jad.2022.11.011

Van Minnen, A., Arntz, A., & Keijsers, G. P. J. (2002). Prolonged exposure in patients with chronic PTSD: predictors of treatment outcome and dropout. *Behaviour Research and Therapy*, *40*(4), 439–457. https://doi.org/10.1016/s0005-7967(01)00024-9

Varker, T., Jones, K. A., Arjmand, H.-A., Hinton, M., Hiles, S. A., Freijah, I., Forbes, D., Kartal, D., Phelps, A., Bryant, R. A., McFarlane, A., Hopwood, M., & O'Donnell, M. (2021). Dropout from guideline-recommended psychological treatments for

posttraumatic stress disorder: A systematic review and meta-analysis. *Journal of Affective Disorders Reports*, *4*, 100093. https://doi.org/https://doi.org/10.1016/j.jadr.2021.100093

Varker, T., Kartal, D., Watson, L., Freijah, I., O'Donnell, M., Forbes, D., Phelps, A., Hopwood, M., McFarlane, A., Cooper, J., Wade, D., Bryant, R., & Hinton, M. (2020). Defining response and nonresponse to posttraumatic stress disorder treatments: A systematic review. *Clinical Psychology: Science and Practice*, *27*(4). https://doi.org/10.1037/H0101781

Veroniki, A. A., Seitidis, G., Tsivgoulis, G., Katsanos, A. H., & Mavridis, D. (2023). An Introduction to Individual Participant Data Meta-analysis. *Neurology*, *100*(23), 1102–1110. https://doi.org/10.1212/WNL.0000000000207078

Vöhringer, M., Knaevelsrud, C., Wagner, B., Slotta, M., Schmidt, A., Stammel, N., & Böttche, M. (2020). Should I stay or must I go? Predictors of dropout in an internet-based psychotherapy programme for posttraumatic stress disorder in Arabic. *European Journal of Psychotraumatology*, *11*(1), 1706297. https://doi.org/10.1080/20008198.2019.1706297

Von Brachel, R., Hirschfeld, G., Berner, A., Willutzki, U., Teismann, T., Cwik, J. C., Velten, J., Schulte, D., & Margraf, J. (2019). Long-Term Effectiveness of Cognitive Behavioral Therapy in Routine Outpatient Care: A 5- to 20-Year Follow-Up Study. *Psychotherapy and Psychosomatics*, *88*(4), 225–235. https://doi.org/10.1159/000500188

Wade, D., Varker, T., Kartal, D., Hetrick, S., O'Donnell, M., & Forbes, D. (2016). Gender difference in outcomes following trauma-focused interventions for posttraumatic stress disorder: Systematic review and meta-analysis. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(3), 356–364. https://doi.org/10.1037/tra0000110

Watts, B. V, Schnurr, P. P., Mayo, L., Young-Xu, Y., Weeks, W. B., & Friedman, M. J. (2013). Meta-analysis of the efficacy of treatments for posttraumatic stress disorder. *The*

Journal of Clinical Psychiatry, *74*(6), e541-50. https://doi.org/10.4088/jcp.12r08225

Weathers, F. W., Keane, T. M., & Davidson, J. R. T. (2001). Clinician-administered PTSD scale: A review of the first ten years of research. *Depression and Anxiety*, *13*(3), 132–156. https://doi.org/https://doi.org/10.1002/da.1029

Weber, M., Schumacher, S., Hannig, W., Barth, J., Lotzin, A., Schäfer, I., Ehring, T., & Kleim, B. (2021). Long-term outcomes of psychological treatment for posttraumatic stress disorder: A systematic review and meta-analysis. *Psychological Medicine*, *51*(9), 1420–1430. https://doi.org/10.1017/S003329172100163X

Wierzbicki, M., & Pekarik, G. (1993). A meta-analysis of psychotherapy dropout. *Professional Psychology: Research and Practice*, *24*(2), 190–195. https://doi.org/10.1037/0735-7028.24.2.190

Wild, J., & Ehlers, A. (2010). Self-study assisted cognitive therapy for PTSD: a case study. *European Journal of Psychotraumatology*, *1*(1), 5599. https://doi.org/10.3402/ejpt.v1i0.5599

Wilkinson, S. T., Stefanovics, E., & Rosenheck, R. A. (2015). Marijuana use is associated with worse outcomes in symptom severity and violent behavior in patients with posttraumatic stress disorder. *The Journal of Clinical Psychiatry*, *76*(9), 1174–1180. https://doi.org/10.4088/JCP.14m09475

Zandberg, L. J., Rosenfield, D., Alpert, E., McLean, C. P., & Foa, E. B. (2016). Predictors of dropout in concurrent treatment of posttraumatic stress disorder and alcohol dependence: Rate of improvement matters. *Behaviour Research and Therapy*, *80*, 1–9. https://doi.org/10.1016/j.brat.2016.02.005

Zang, Y., Su, Y.-J., McLean, C. P., & Foa, E. B. (2019). Predictors for Excellent Versus Partial Response to Prolonged Exposure Therapy: Who Needs Additional Sessions? *Journal of Traumatic Stress*, *32*(4), 577–585.

https://doi.org/https://doi.org/10.1002/jts.22412

Zayfert, C., DeViva, J. C., Becker, C. B., Pike, J. L., Gillock, K. L., & Hayes, S. A. (2005). Exposure Utilization and Completion of Cognitive Behavioral Therapy for PTSD in a "Real World" Clinical Practice. *Journal of Traumatic Stress,* 18, 637–645. https://doi.org/10.1002/jts.20072

Zimmermann, D., Rubel, J., Page, A. C., & Lutz, W. (2017). Therapist effects on and predictors of non-consensual dropout in psychotherapy. *Clinical Psychology & Psychotherapy*, *24*(2), 312–321. https://doi.org/10.1002/cpp.2022

Appendix

Appendix A. Publication II

A1. References included in the meta-analysis

*Adenauer, H., Catani, C., Gola, H., Keil, J., Ruf, M., Schauer, M., & Neuner, F. (2011). Narrative exposure therapy for PTSD increases top-down processing of aversive stimuli-evidence from a randomized controlled treatment trial. *BMC neuroscience*, *12*(1), 1-13. https://doi.org/10.1186/1471-2202-12-127

*Buhmann, C. B., Nordentoft, M., Ekstroem, M., Carlsson, J., & Mortensen, E. L. (2016). The effect of flexible cognitive–behavioural therapy and medical treatment, including antidepressants on post-traumatic stress disorder and depression in traumatised refugees: pragmatic randomised controlled clinical trial. *The British Journal of Psychiatry*, *208*(3), 252-259.

*Buhmann, C. B., Nordentoft, M., Ekstroem, M., Carlsson, J., & Mortensen, E. L. (2018). Long-term treatment effect of trauma-affected refugees with flexible cognitive behavioural therapy and antidepressants. *Psychiatry research*, *264*, 217-223. https://doi.org/10.1016/j.psychres.2018.03.069

*Carlsson, J., Sonne, C., Vindbjerg, E., & Mortensen, E. L. (2018). Stress management versus cognitive restructuring in trauma-affected refugees—A pragmatic randomised study. *Psychiatry research*, *266*, 116-123. https://doi.org/10.1016/j.psychres.2018.05.015

*Goodkind, J. R., Bybee, D., Hess, J. M., Amer, S., Ndayisenga, M., Greene, R. N., ... & Pannah, M. (2020). Randomized controlled trial of a multilevel intervention to address social determinants of refugee mental health. *American journal of community psychology*, *65*(3-4), 272-289. https://doi.org/10.1002/ajcp.12418

*Hensel-Dittmann, D., Schauer, M., Ruf, M., Catani, C., Odenwald, M., Elbert, T., & Neuner, F. (2011). Treatment of traumatized victims of war and torture: a randomized controlled comparison of narrative exposure therapy and stress inoculation training. *Psychotherapy and psychosomatics*, *80*(6), 345-352. https://doi.org/10.1159/000327253

*Hijazi, A. M., Lumley, M. A., Ziadni, M. S., Haddad, L., Rapport, L. J., & Arnetz, B. B. (2014). Brief narrative exposure therapy for posttraumatic stress in Iraqi refugees: A preliminary randomized clinical trial. *Journal of traumatic stress*, *27*(3), 314-322. https://doi.org/10.1002/jts.21922

*Hinton, D. E., Chhean, D., Pich, V., Safren, S. A., Hofmann, S. G., & Pollack, M. H. (2005). A randomized controlled trial of cognitive-behavior therapy for Cambodian refugees with treatment-resistant PTSD and panic attacks: A cross-over design. *Journal of Traumatic Stress: Official Publication of The International Society for Traumatic Stress Studies*, *18*(6), 617-629. https://doi.org/10.1002/jts.20070

*Hinton, D. E., Hofmann, S. G., Pollack, M. H., & Otto, M. W. (2009). Mechanisms of efficacy of CBT for Cambodian refugees with PTSD: Improvement in emotion regulation and orthostatic blood pressure response. *CNS neuroscience & therapeutics*, *15*(3), 255-263. https://doi.org/10.1111/j.1755-5949.2009.00100.x

*Hinton, D. E., Pham, T., Tran, M., Safren, S. A., Otto, M. W., & Pollack, M. H. (2004). CBT for Vietnamese refugees with treatment-resistant PTSD and panic attacks: A pilot study. *Journal of Traumatic Stress: Official Publication of The International Society for*

Traumatic Stress Studies, *17*(5), 429-433. https://doi.org/10.1023/B:JOTS.0000048956.03529.fa

*Jespersen, K. V., & Vuust, P. (2012). The effect of relaxation music listening on sleep quality in traumatized refugees: A pilot study. *Journal of Music Therapy*, *49*(2), 205-229. https://doi.org/10.1093/jmt/49.2.205

*Kananian, S., Soltani, Y., Hinton, D., & Stangier, U. (2020). Culturally Adapted Cognitive Behavioral Therapy Plus Problem Management (CA-CBT+) With Afghan Refugees: A Randomized Controlled Pilot Study. *Journal of Traumatic Stress*, *33*(6), 928-938. https://doi.org/10.1002/jts.22615

*Lehnung, M., Shapiro, E., Schreiber, M., & Hofmann, A. (2017). Evaluating the EMDR Group traumatic episode protocol with refugees: A field study. *Journal of EMDR Practice and Research*, *11*(3), 129-138. https://doi.org/10.1891/1933-3196.11.3.129

*Lindegaard, T., Seaton, F., Halaj, A., Berg, M., Kashoush, F., Barchini, R., ... & Andersson, G. (2021). Internet-based cognitive behavioural therapy for depression and anxiety among Arabic-speaking individuals in Sweden: a pilot randomized controlled trial. *Cognitive Behaviour Therapy*, 50:1, 47-66, https://doi.org/10.1080/16506073.2020.1771414

*Morath, J., Gola, H., Sommershof, A., Hamuni, G., Kolassa, S., Catani, C., ... & Kolassa, I. T. (2014). The effect of trauma-focused therapy on the altered T cell distribution in individuals with PTSD: evidence from a randomized controlled trial. *Journal of Psychiatric Research*, *54*, 1-10.

*Neuner, F., Kurreck, S., Ruf, M., Odenwald, M., Elbert, T., & Schauer, M. (2010). Can asylum-seekers with posttraumatic stress disorder be successfully treated? A randomized controlled pilot study. *Cognitive behaviour therapy*, *39*(2), 81-91. https://doi.org/10.1080/16506070903121042

*Nickerson, A., Byrow, Y., Pajak, R., McMahon, T., Bryant, R. A., Christensen, H., & Liddell, B. J. (2020). 'Tell Your Story': a randomized controlled trial of an online intervention to reduce mental health stigma and increase help-seeking in refugee men with posttraumatic stress. *Psychological medicine*, *50*(5), 781-792. https://doi.org/10.1017/S0033291719000606

*Nordbrandt, M. S., Sonne, C., Mortensen, E. L., & Carlsson, J. (2020). Trauma-affected refugees treated with basic body awareness therapy or mixed physical activity as augmentation to treatment as usual—A pragmatic randomised controlled trial. *PloS one*, *15*(3), e0230300. https://doi.org/10.1371/journal.pone.0230300

*Northwood, A. K., Vukovich, M. M., Beckman, A., Walter, J. P., Josiah, N., Hudak, L., ... & Danner, C. C. (2020). Intensive psychotherapy and case management for Karen refugees with major depression in primary care: a pragmatic randomized control trial. *BMC family practice*, *21*(1), 17. https://doi.org/10.1186/s12875-020-1090-9

*Nygren T, Brohede D, Koshnaw K, Osman SS, Johansson R, Andersson G. (2019). Internet-based treatment of depressive symptoms in a Kurdish population: A randomized controlled trial. *Journal of Clinical Psychology, 75*(6):985-998. doi: 10.1002/jclp.22753.

*Paunovic, N., & Öst, L. G. (2001). Cognitive-behavior therapy vs exposure therapy in the treatment of PTSD in refugees. *Behaviour research and therapy*, *39*(10), 1183-1197. https://doi.org/10.1016/s0005-7967(00)00093-0

*Renner, W., Bänninger-Huber, E., & Peltzer, K. (2011). Culture-Sensitive and Resource Oriented Peer (CROP)-Groups as a community based intervention for trauma survivors: A randomized controlled pilot study with refugees and asylum seekers from Chechnya. *Australasian Journal of Disaster and Trauma Studies, 2011*(1), 1–13.

*Renner, W., Laireiter, A. R., & Maier, M. J. (2012). Social Support from Sponsorships as a Moderator of Acculturative Stress: Predictors of Effects on Refugees and Asylum Seekers. *Social behavior and personality*, *40*(1), 129–146. https://doi.org/10.2224/sbp.2012.40.1.129

*Röhr, S., Jung, F. U., Pabst, A., Grochtdreis, T., Dams, J., Nagl, M., ... & Riedel-Heller, S. G. (2021). A Self-Help App for Syrian Refugees With Posttraumatic Stress (Sanadak): Randomized Controlled Trial. *JMIR mHealth and uHealth*, *9*(1), e24807. https://doi.org/10.2196/24807

*Sonne, C., Carlsson, J., Bech, P., Elklit, A., & Mortensen, E. L. (2016). Treatment of trauma-affected refugees with venlafaxine versus sertraline combined with psychotherapy-a randomised study. *BMC psychiatry*, *16*(1), 1-13. https://doi.org/10.1186/s12888-016-1081-5

*Stenmark, H., Catani, C., Neuner, F., Elbert, T., & Holen, A. (2013). Treating PTSD in refugees and asylum seekers within the general health care system. A randomized controlled multicenter study. *Behaviour research and therapy*, *51*(10), 641-647. https://doi.org/10.1016/j.brat.2013.07.002

*Ter Heide, F. J. J., Mooren, T., Kleijn, W., de Jongh, A., & Kleber, R. (2011). EMDR versus stabilisation in traumatised asylum seekers and refugees: Results of a pilot study. *European journal of psychotraumatology*, *2*(1), 5881. https://doi.org/10.3402/ejpt.v2i0.5881

*Ter Heide, F. J. J., Mooren, T. M., Van de Schoot, R., De Jongh, A., & Kleber, R. J. (2016). Eye movement desensitisation and reprocessing therapy v. stabilisation as usual for refugees: randomised controlled trial. *The British Journal of Psychiatry*, *209*(4), 311-318. https://doi.org/10.1192/bjp.bp.115.167775

*Weine, S., Kulauzovic, Y., Klebic, A., Besic, S., Mujagic, A., Muzurovic, J., ... & Rolland, J. (2008). Evaluating a multiple-family group access intervention for refugees with PTSD. *Journal of marital and family therapy*, *34*(2), 149-164. https://doi.org/10.1111/j.1752-0606.2008.00061.x

A2. Search Strategy

Term	Indexing Terms	MESH (Pubmed)	Index Term (PsycInfo)	PSTDpubs Thesaurus	Web of Science
Refugee	refugee*; "asylum seeker*"; migrant; "displaced person"; "displaced people", torture*,	"Refugees", "Torture", "Transients and Migrants"	Refugees, "Asylum Seeking", Torture, "Human Migration"	"Displaced Persons", Migrants, "Refugees", "Asylum Seekers", Torture	No specific indexing terms
Psychological/ psychosocial interventions	trial, intervention, treatment, psychother*, psychological, psychosocial, therap*	"Clinical Trial", "therapy", "Psychotherapy", "Psychosocial Support Systems"	Treatment; Clinical Trial, Psychotherapy, Sociotherapy,	Treatment; Clinical Trial, Psychotherapy,	No specific indexing terms
Dropout	attrition, dropout, drop-out, "dropout", discontinuation, "premature termination", noncompletion, adherence, "psychotherapy dropout", "client variables", "therapist variables", termination	Patient Dropouts, Patient Compliance, Treatment refusal	Dropouts, "Treatment Dropouts"; "Treatment Compliance"; "Treatment Refusal"; "Treatment Termination", "Experimental Attrition"	"Treatment Dropouts", "Treatment Compliance"	No specific indexing terms
RCT	"randomized controlled trial", "controlled clinical trial", "randomized", "randomly"	String according to Cuijpers, P. (2016)[5]			

Database Search Strings

	PubMed	
S 1	(refugee*[Title/Abstract] OR "asylum seeker*"[Title/Abstract] OR migrant[Title/Abstract] OR "displaced person*"[Title/Abstract] OR "displaced people"[Title/Abstract] OR torture*[Title/Abstract] OR refugee*[OT] OR "asylum seeker*"[OT] OR migrant[OT] OR "displaced person*"[OT] OR "displaced people"[OT] OR torture*[OT] OR "Refugees"[Mesh] OR "Torture"[Mesh] OR "Transients and Migrants"[Mesh]) AND (trial[Title/Abstract] OR intervention[Title/Abstract] OR treatment[Title/Abstract] OR psychother*[Title/Abstract] OR psychological[Title/Abstract] OR psychosocial[Title/Abstract] OR therap*[Title/Abstract] OR trial[OT] OR intervention[OT] OR treatment[OT] OR psychother*[OT] OR psychological[OT] OR psychosocial[OT] OR therap*[OT] OR "Clinical Trial" [Publication Type] OR "therapy" [Subheading] OR "Psychotherapy"[Mesh] OR "Psychosocial Support Systems"[Mesh]) AND ("randomized controlled trial"[PT] OR "controlled clinical trial"[PT] OR "randomized"[Title/Abstract] OR "randomly"[Title/Abstract])	454

[5] Cuijpers, P. (2016). Meta-analyses in mental health research. A practical guide. *Amsterdam, the Netherlands: Pim Cuijpers Uitgeverij*.

S2	(refugee*[Title/Abstract] OR "asylum seeker*"[Title/Abstract] OR migrant[Title/Abstract] OR "displaced person*"[Title/Abstract] OR "displaced people"[Title/Abstract] OR torture*[Title/Abstract] OR refugee*[OT] OR "asylum seeker*"[OT] OR migrant[OT] OR "displaced person*"[OT] OR "displaced people"[OT] OR torture*[OT] OR "Refugees"[Mesh] OR "Torture"[Mesh] OR "Transients and Migrants"[Mesh]) AND (trial[Title/Abstract] OR intervention[Title/Abstract] OR treatment[Title/Abstract] OR psychother*[Title/Abstract] OR psychological[Title/Abstract] OR psychosocial[Title/Abstract] OR therap*[Title/Abstract] OR trial[OT] OR intervention[OT] OR treatment[OT] OR psychother*[OT] OR psychological[OT] OR psychosocial[OT] OR therap*[OT] OR "Clinical Trial" [Publication Type] OR "therapy" [Subheading] OR "Psychotherapy"[Mesh] OR "Psychosocial Support Systems"[Mesh]) AND (attrition[Title/Abstract] OR dropout[Title/Abstract] OR drop-out[Title/Abstract] OR "drop out"[Title/Abstract] OR discontinuation[Title/Abstract] OR "premature termination"[Title/Abstract] OR noncompletion[Title/Abstract] OR adherence[Title/Abstract] OR "psychotherapy dropout"[Title/Abstract] OR "client variables"[Title/Abstract] OR "therapist variables"[Title/Abstract] OR termination[Title/Abstract] OR attrition[OT] OR dropout[OT] OR drop-out[OT] OR "drop out"[OT] OR discontinuation[OT] OR "premature termination"[OT] OR noncompletion[OT] OR adherence[OT] OR "client variables"[OT] OR "therapist variables"[OT] OR termination[OT] OR "Patient Dropouts"[Mesh] OR "Patient Compliance"[Mesh] OR "Treatment Refusal"[Mesh])	310
	PsycInfo	
S1	(TI(refugee* OR “asylum seeker*” OR migrant OR "displaced person*" OR "displaced people" OR torture*) OR AB(refugee* OR “asylum seeker*” OR migrant OR "displaced person*" OR "displaced people" OR torture*) OR KW(refugee* OR "asylum seeker*" OR migrant OR "displaced person*" OR "displaced people" OR torture*) OR SU(Refugees OR "Asylum Seeking" OR Torture OR "Human Migration")) AND (TI(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR AB(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR KW(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR SU(Treatment OR “Clinical Trial” OR Psychotherapy OR Sociotherapy)) AND (PT(“randomized controlled trial” OR “controlled clinical trial”) OR TI(“randomized” OR “randomly”) OR AB(“randomized” OR “randomly”))	184
S2	(TI(refugee* OR “asylum seeker*” OR migrant OR "displaced person*" OR "displaced people" OR torture*) OR AB(refugee* OR “asylum seeker*” OR migrant OR "displaced person" OR "displaced people" OR torture*) OR KW(refugee* OR "asylum seeker*" OR migrant OR "displaced person" OR "displaced people" OR torture*) OR SU(Refugees OR "Asylum Seeking" OR Torture OR "Human Migration")) AND (TI(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR AB(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR KW(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR SU(Treatment OR Clinical Trial OR Psychotherapy OR Sociotherapy)) AND (TI(attrition OR dropout OR drop-out OR "drop out" OR discontinuation OR "premature termination OR noncompletion OR adherence OR "psychotherapy dropout" OR "client variables" OR "therapist variables" OR termination) OR AB(attrition OR dropout OR drop-out OR "drop out" OR discontinuation OR "premature termination OR noncompletion OR adherence OR "psychotherapy dropout" OR "client variables" OR "therapist variables" OR termination) OR KW(attrition OR dropout OR drop-out OR "drop out" OR discontinuation OR "premature termination OR noncompletion OR adherence OR "psychotherapy dropout" OR "client variables" OR "therapist variables" OR termination) OR SU(Dropouts OR "Treatment Dropouts" OR "Treatment Compliance" OR "Treatment Refusal" OR "Treatment Termination" OR "Experimental Attrition"))	129
	Web of Science	
S1	TS=(refugee* OR "asylum seeker*" OR migrant OR "displaced person*" OR "displaced people" OR torture*) AND TS=(trial OR intervention OR treatment OR psychother* OR psychological OR	701

	psychosocial OR therap*) AND TS=("randomized controlled trial" OR "controlled clinical trial" OR randomized OR randomly)	
S2	TS=(refugee* OR "asylum seeker*" OR migrant OR "displaced person" OR "displaced people" OR torture*) AND TS=(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) AND TS=(dropout OR drop-out OR "drop out" OR attrition OR discontinuation OR "premature termination" OR noncompletion" OR adherence" OR "psychotherapy dropout" OR "client variables" OR "therapist variables" OR termination OR "Patient Dropout" OR "Treatment Refusal" OR Compliance)	228
	PTSDpubs	
S1	(TI(refugee* OR “asylum seeker*” OR migrant OR "displaced person*" OR "displaced people" OR torture*) OR AB(refugee* OR “asylum seeker*” OR migrant OR "displaced person" OR "displaced people" OR torture*) OR SU(Refugees OR "Asylum Seekers" OR Torture OR Migrants OR “Displaced Persons”)) AND (TI(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR AB(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR SU(Treatment OR Clinical Trial OR Psychotherapy)) AND (TI(“randomized controlled trial” OR “controlled clinical trial”) OR AB(“randomized controlled trial” OR “controlled clinical trial”) OR SU(“randomized controlled trial” OR “controlled clinical trial”) OR TI(“randomized” OR “randomly”) OR AB(“randomized” OR “randomly”) OR SU(“randomized” OR “randomly”))	93
S2	(TIAB(refugee* OR “asylum seeker*” OR migrant OR "displaced person" OR "displaced people" OR torture*) OR SU(Refugees OR "Asylum Seekers" OR Torture OR Migrants OR “Displaced Persons”)) AND (TIAB(trial OR intervention OR treatment OR psychother* OR psychological OR psychosocial OR therap*) OR SU(Treatment OR Clinical Trial OR Psychotherapy)) AND (TIAB(dropout OR drop-out OR "drop out" OR attrition OR discontinuation OR "premature termination" OR noncompletion" OR adherence" OR "psychotherapy dropout" OR "client variables" OR "therapist variables" OR termination) OR SU(“Treatment Dropouts” OR “Treatment Compliance”))	29

Overview of Search Results

1. Pubmed: 764 includes records (454 through search string 1; 310 through search string 2)
2. PsycInfo: 313 includes records (184 through search string 1; 129 through search string 2)
3. Web of Science: 929 includes records (701 through search string 1; 228 through search string 2)
4. PTSDpubs: 124 includes records (93 through search string 1; 31 through search string 2)

Total of included studies: 2.130
After removing duplicates: 1.447

Other Sources

Process:

(1) According to the initial search:
Check references of meta-analysis and systematic reviews of psychological or psychosocial treatment for displaced persons (refugees or asylum seeker resettled in high income countries). Check references of meta-analysis and systematic reviews for dropout in psychological or psychosocial treatment for displaced persons.
Search in Databases for meta-analysis and systematic reviews / search in Cochrane database of systematic reviews

(2) Check grey literature including dissertations and theses, reports, evaluations published on websites, clinical guidelines and reports from regulatory agencies. In addition, search key agencies and initiatives in the field for relevant reports.

(3) Check reference list of all included studies

Process and Results

(1) Searching for Meta-analysis (MA) and reviews (Rev) in Databases

1. Pubmed: S1: 222 MA/ Rev. scanned; 7 retrieved; S2: 25 MA/ Rev scanned; 0 retrieved
2. PsychInfo: S1: 345 MA/ Rev scanned (after adjustment of strategy); 5 retrieved; S2: 5 MA/ Rev scanned, 0 retrieved
3. WebofScience: S1: 93 MA/ Rev scanned; 6 retrieved; S2: 18 MA/ Rev scanned; 0 retrieved
4. PTSDpubs: S1 (after adjustment of strategy): 50, MA/ Rev scanned; 0 retrieved; S2: 0 MA/ Rev Scanned
5. Further checked meta-analysis & review**s: 3**

Meta-analysis and systematic reviews retrieved for reference screening: **21**
Studies Additionally identified: 11

(2) Check grey literature

1. Clinical Guidelines: checked: 10; studies additionally retrieved: **1**
2. Dissertations and theses: checked 2, studies additionally retrieved: 0
3. Reports: checked: 5; studies additionally retrieved: 0
4. Books: *search on PsycBook and Web of Science, filter Books.* Checked: 3, studies additionally retrieved: **1**
5. Evaluations published on websites Checked: 5; studies additionally retrieved (direct) 0 (but retrieved MA)
6. Conference contribution: checked: 1; studies additionally retrieved: **0**

Grey Literature checked for additional references: 26
Studies Additionally identified: 2

(3) Check reference list of all included studies

Additional references: 0

Studies Additionally identified: 0

Updated search

1. Pubmed: 119 new searched records TAA (80 through search string 1; 39 through search string 2): 6 studies in full-text screening
2. PsycInfo: 28 new searched records TAA (24 through search string 1; 4through search string 2): 0 studies in full-text search
3. Web of Science: 154 new searched records TAA (118 through search string 1; 36 through search string 2): 1 study in full-text search
4. PTSDpubs: new searched records TAA (0 through search string 1; through search string 2): 0 studies in full-text search

New papers screened: 301
Full-text screening: 7

A3. List of excluded studies

Study	Reason for exclusion
Acarturk C, Konuk E, Cetinkaya M, Senay I, Sijbrandij M, Cuijpers P, Aker T (2015).	Not resettled in high-income countries
Acarturk C, Konuk E, Cetinkaya M, Senay I, Sijbrandij M, Gluen, B., Cuijpers P (2016).	Not resettled in high-income countries
Al-Hadethe A, Hunt N, Al-Qaysi G, Thomas S (2015)	No refugees or asylum seekers
Betancourt, T S., Berent, J M., Freeman, J., Frounfelker, R L., Brennan, R T., Abdi, S., Maalim, A., Abdi, A., Mishra, T., Gautam, B., Creswell, J W., Beardslee, W R (2019)	Family intervention
Blom, M., Hoek, H., Spinhoven, P., Hoencamp, E., Haffmans, P. M. P., van Dyck R.	Not focusing on refugees or asylum seekers
Bolton, P., Bass, J., Zangana, G. A. S., Kamal, T., Murray, S., Kaysen, D., Lejuez, C.W., Lindgren, K., Pagoto, S., Murray, L., Van Wyk, S., Ahmed, A. M., Amin, N. M., Rosenblum, M. (2014)	Not resettled in high-income countries
Bolton, P., Lee, C., Haroz, E. E., Murray, L., Dorsey, S., Robinson, C., Ugueto, A. M., Bass, J. (2014)	Not resettled in high-income countries
Buhmann C, Andersen I, Mortensen EL, Ryberg J, Nordentoft M, Ekstrøm M. (2015)	No randomized controlled trial
Cavka, M., Joksimovic, L., Schmitz, N., Kruse, J., (2005)	No peer-reviewed journal article (authors contacted)
D'Ardenne, P., Ruaro, L., Cestari, L., Fakhoury, W., Priebe, S. (2007)	No randomization
Drožđek, B., Bolwerk, N. (2010)	No randomization
Drožđek, B., Kamperman, A. M., Bolwerk, N., Tol, W. A., Kleber, R. J. (2012)	Same sample as in Drožđek et al. (2010)
de la Rie, S. M., Smid, G. E., van der Aa, N., van Est, L. A., Bisseling, E., & Boelen, P. A. (2020)	no randomized controlled trial
Ekstrom, M., Sonne, C., Carlsson, J., Bech, P., Elklit, A. (2016)	Second report about already included data (Sonne et al., 2016)
Goodkind, J., Amer, S., Christian, C. (2017)	Evaluation of RCT, no clinical outcome measures
Goodkind, J., Hess, JM, Isakson, B., LaNoue, M., Githinji, A., Roche, N., Vadnais, K., Parker, D.P. (2014)	No randomized controlled trial
Gordon, J., Staples, J., Blyta, A., Bytyqi, M., Wilson, A. T. (2008)	War-traumatized Kosovar adolescents, not refugees
Halvorsen, J., Stenmark, H., Neuner, F., Nordahl, H. M. (2014)	Second report about already included data (Stenmark et al., 2013)
Hárdi, L., & Kroo, A. (2011).	No randomized controlled trial
Hasha, W., Igland, J., Fadnes, L. T., Kumar, B., Haj-Younes, J., Strømme, E. M., ... & Diaz, E. (2020).	No psychological or psychosocial intervention

Hijazi, A. M. (2012)	Dissertation, publication see Hijazi et al. (2014)
Hinton, D., Hofmann, S., Rivera, E., Otto, M. W., Pollack, M. H. (2011)	Not focusing on refugees or asylum seekers
Hoffman, S. J., Walstad, A., Loo, J. L. L., Moe, M., Thao, J., Albert, A., ... & Porta, C. M. (2020).	No randomized controlled trial
Holmqvist, R., Andersen, K., Anjum, T., Alinder, B. (2006)	No randomized controlled trial
Knaevelsrud, C., Brand, J., Lange, A., Ruwaard, J., Wagner, B. (2015)	Not focusing on refugees and asylum seekers resettled in high income countries
Knefel, M., Kantor, V., Nicholson, A. A., Schiess-Jokanovic, J., Weindl, D., Schäfer, I., & Lueger-Schuster, B. (2020).	Study protocol
Koch, T., Ehring, T., Liedl, A. (2020)	Young refugees (<18 years)
Kruse, J., Joksimovic, L., Cavka, M., Woeller, W., Schmitz, N., (2009)	No randomization
Liedl, A., Muller, J., Morina, N., Karl, A., Denke, C., Knaevelsrud, C. (2011)	retracted
Otto, M. W., Hinton, D., Korbly, N. B., Chea, A., Ba, P., Gershuny, B. S., Pollack, M. H. (2003)	No reported dropout rate
Pfeiffer, E., Sachser, C., Rohlmann, F., Goldbeck, L. (2018)	Young refugees (<18 years)
Pfeiffer, E., Sachser, C., Tutus, D., Fegert, J M., Plener, P L. (2019)	Young refugees (<18 years)
Renner, W., Peltzer K. (2008)	Already included study (Renner et al., 2011)
Schauer, M., Elbert, T., Gotthardt, S., Rockstroh, B., Odenwald, M., Neuner, F. (2006)	No RCT. Report includes unpublished data. Published: Neuner et al. (2010)
Shaw, S., Ward, K., Pillai, V., Hinton, D. (2018)	Not resettled in high-income countries
Stenmark, H., Catani, T., Elbert, T., Gotestam, K.G. (2008)	Preliminary results (see Stenmark et al., 2013)
Yurtsever, A., Konuk, E., Akyuz, T., Zat, Z., Tukel, F., Cetinkaya, M., Savran, C., Shapiro, E. (2018)	Not resettled in high-income countries

A4. Overview and Full Table of included studies and variables

Table A4.1

Overview of Included Studies.

Study and Treatment (Label / Description)	*N* incl. in treatment	Dropout *n* (%)	Definition of Dropout	Modality	Age (*M*)	% female
Adenauer et al. (2011)						
NET	16	1 (6.3)	Completion-based	Individual	30.3	43.8
Buhmann et al. (2016, 2018)						
CBT	70	18 (25.7)	Completion-based	Individual	-	-
CBT/ CBT + PT + Co	71	16 (22.5)	Completion-based	Individual	-	-
Other/ PT + PE + Co	71	9 (12.7)	Completion-based	Individual	-	-
Carlsson et al. (2018)						
CBT/ Stress management	70	17 (24.3)	Duration-based	Individual	43.1	43.6
CBT/cognitive restructuring	70	18 (25.7)	Duration-based	Individual	43.5	43.8
Goodkind et al. (2020)						
Other/ Refugee well-being project	119	1 (0.8)	Missed-appointment	Combination	36.2	52.1
Hensel-Dittmann et al. (2011)						
NET	15	4 (26.7)	Missed-appointment	Individual	-	-
CBT/ Stress inoculation Training	13	3 (23.1)	Missed-appointment	Individual	-	-
Hijazi et al. (2014)						
NET	41	3 (7.3)	Completion-based	Individual	-	63.4
Hinton et al. (2004)						
CBT	6	0 (0.0)	Completion-based	Individual	-	50.0
Hinton et al. (2005)						
CBT	20	0 (0.0)	Completion-based	Individual	50.9	60.0
Hinton et al. (2009)						
CBT	12	0 (0.0)	Completion-based	Individual	49.9	60.0
Jespersen et al. (2012)						
Other/ Relaxation music	10	1 (10.0)	Completion-based	Individual	-	-
Kananian et al. (2020)						
CBT/ CA-CBT+	12	1 (8.3)	Completion-based	Group	21.0	0.0
Lehnung et al. (2017)						
EMDR	12	0 (0.0)	Completion-based	Group	31.3	25.0
Lindegaard et al. (2021)						
CBT/ App-based CBT	30	12 (40.0)	Completion-based	Individual	40.5	36.7
Morath et al. (2014)						
NET	17	0 (0.0)	Completion-based	Individual	28.0	47.1
Neuner et al. (2010)						
NET	16	2 (12.5)	Therapist-judgment	Individual	31.1	31.3
Nickerson et al. (2019)						
Other/ TYS online	54	10 (18.5)	Completion-based	Individual	38.3	0.0
Nordbrandt et al. (2020)						
Other/ BBAT + TAU	114	22 (21.0)	Completion-based	Individual	43.1	53.3
Other/ Physical Activity & TAU	114	32 (29.4)	Completion-based	Individual	44.6	50.5
Northwood et al. (2020)						
Other/ IPCM	112	15 (13.4)	Completion-based	Individual	43.8	82.1
Nygren et al. (2019)						
CBT/ ICBT	25	5 (20.0)	Completion-based	Individual	33.0	44.0
Paunovic & Öst (2001)						
CBT	10	3 (30.0)	Missed-appointment	Individual	-	-
CBT/ Exposure therapy	10	1 (10.0)	Missed-appointment	Individual	-	-
Renner et al. (2012)						
Other/ Social Support from sponsorship	34	9 (26.5)	Missed-appointment	Individual	-	-
Renner et al. (2011)						
CBT	25	13 (52.0)	Missed-appointment	Group	-	47.6
EMDR	21	11 (52.4)	Missed-appointment	Individual	-	52.9
Other/ CORP	17	11 (64.7)	Missed-appointment	Group	-	40.0
Röhr et al. (2021)						
CBT/ App-based CBT	65	6 (9.2)	Completion-based	Individual	33.0	33.8
Sonne et al. (2011)						
CBT/ Sertraline + CBT + Co	98	30 (30.6)	Duration-based	Individual	43.2	37.8
CBT/ Venlafaxine + CBT + Co	109	21 (19.3)	Duration-based	Individual	44.0	41.7
Stenmark et al. (2013)						
NET	51	13 (25.5)	Completion-based	Individual	34.5	33.3
Ter Heide et al. (2016)						
EMDR	37	7 (18.9)	Missed-appointment	Individual	43.1	16.7
Other/ Stabilization as usual	37	9 (24.3)	Missed-appointment	Individual	39.8	38.9
Ter Heide et al. (2011)						
EMDR	10	5 (50.0)	Completion-based	Individual	40.0	50.0
Other/ Stabilization	10	5 (50.0)	Completion-based	Individual	43.0	50.0
Weine et al. (2008)						
Other/ CAFES	110	19 (17.9)	Completion-based	Group	38.5	51.7

Note. CBT = Cognitive-Behavioral Therapy, EMDR = Eye Movement Desensitization and Reprocessing, NET = Narrative Exposure Therapy, TAU = Treatment-as-usual, PT = psychopharmacological treatment, PE = Psychoeducation, Co = consulting, CA-CBT+ = Culturally Adapted CBT plus Problem Management, TYS = Tell your Story, BBAT = Basic Body Awareness Therapy, IPCM = Intensive Psychotherapy and Case Management, ICBT = Internet-based Cognitive-Behavioral Therapy, CORP = Cultural-Sensitive and Resource Oriented Peer Group, CAFES = Coffee and Families Education and Support.

Table A4.2

Full Table of all included studies and variables

Study and Treatment (Label / Description)	N Study	N Int	N DO Int	DR (Int)	N CG	N DO CG	DR CG	Publication Year	Country of Publication
Adenauer et al. (2011)	34				18	2	11.1	2011	Germany
NET		16	1	6.3					
Buhmann et al. (2016, 2018)	280				68	20	29.4	2016	Denmark
CBT		70	18	25.7					
CBT/ CBT + PT + Co		71	16	22.5					
Other/ PT + PE + Co		71	9	12.7					
Carlsson et al. (2018)	140							2018	Denmark
CBT/ Stress management		70	17	24.3					
CBT/cognitive restructuring		70	18	25.7					
Goodkind et al. (2020)	290				171	7	4.1	2020	USA
Other/ Refugee well-being project		119	1	0.8					
Hensel-Dittmann et al. (2011)	28							2011	Germany
NET		15	4	26.7					
CBT/ Stress inoculation Training		13	3	23.1					
Hijazi et al. (2014)	63				22	1	4.6	2014	USA
NET		41	3	7.3					
Hinton et al. (2004)	12			0.0	6	0	0.0	2004	USA
CBT		6	0						
Hinton et al. (2005)	40				20	0	0.0	2005	USA
CBT		20	0	0.0					
Hinton et al. (2009)	24				12	0	0.0	2009	USA
CBT		12	0	0.0					
Jespersen et al. (2012)	19				9	3	33.3	2012	Denmark
Other/ Relaxation music		10	1	10.0					
Kananian et al. (2020)	24				12	0	0.00	2020	Germany
CBT/ CA-CBT+		12	1	8.3					
Lehnung et al. (2017)	18				6	0	0.0	2017	Germany
EMDR		12	0	0.0					
Lindegaard et al. (2021)	59				29	11	37.9	2021	Sweden
CBT/ App-based CBT		30	12	40.0					
Morath et al. (2014)	34				17	0	0.0	2014	Germany
NET		17	0	0.0					
Neuner et al. (2010)	32				16	0	0.0	2012	Germany
NET		16	2	12.5					
Nickerson et al. (2019)	103				49	9	18.4	2019	Australia
Other/ TYS online		54	10	18.5					
Nordbrandt et al. (2020)	338				110	23	22.1	2020	Denmark
Other/ BBAT + TAU		114	22	21.0					
Other/ Physical Activity & TAU			32	29.4					
Northwood et al. (2020)	214				102	6	5.9	2020	USA
Other/ IPCM		112	15	13.4					
Nygren et al. (2019)	50				25	9	36.0	2019	Sweden
CBT/ ICBT		25	5	20.0					
Paunovic & Öst (2001)	20							2001	Sweden
CBT		10	3	30.0					
CBT/ Exposure therapy		10	1	10.0					
Renner (2012)	63				29	0	0.0	2012	Austria
Other/ Social Sup. f. sponsorship		34	9	26.5					
Renner et al. (2011)	94				31	15	48.4	2011	Austria
CBT		25	13	52.0					
EMDR		21	11	52.4					
Other/ CORP		71	11	64.7					
Röhr et al. (2021)	133				68	2	2.9	2021	Germany
CBT/ App-based CBT		65	6	9.23					
Sonne et al. (2011)	207							2016	Denmark
CBT/ Sertraline + CBT + Co		98	30	30.6					
CBT/ Venlafaxine + CBT + Co		109	21	19.8					
Stenmark et al. (2013)	81				30	8	26.7	2013	Norway
NET		51	13	25.5					
Ter Heide (2016)	74							2016	Netherlands
EMDR		37	7	18.9					
Other/ Stabilization as usual		37	9	24.3					
Ter Heide et al. (2011)	20							2011	Netherlands
EMDR		10	5	50.0					
Other/ Stabilization		10	5	50.0					
Weine et al. (2008)	197				87	12	13.8	2008	USA
Other/ CAFES		110	19	17.9					

Study and Treatment (Label / Description)	Study Type	Definition of Dropout	Age (M)	% female	% committed relationship	% employed
Adenauer et al. (2011)	Efficacy	completion-based				
NET			30.30	43.8	-	-
Buhmann et al. (2016, 2018)	Effectiveness	completion-based				
CBT			-	-	-	-
CBT/ CBT + PT + Co				-	-	-
Other/ PT + PE + Co				-	-	-
Carlsson et al. (2018)	Effectiveness	duration-based				
CBT/ Stress management			43.1	43.6	51.60	-
CBT/cognitive restructuring			43.5	43.8	46.80	-
Goodkind et al. (2020)	Effectiveness	Missed appointments				
Other/ Refugee well-being project			36.18	52.1	57.98	-
Hensel-Dittmann et al. (2011)	Efficacy					
NET			-	-	-	-
CBT/ Stress inoculation Training			-	-	-	-
Hijazi et al. (2014)	Efficacy	completion-based				
NET			-	63.4	65.90	-
Hinton et al. (2004)	Effectiveness	completion-based				
CBT			-	50.0	-	-
Hinton et al. (2005)	Efficacy	completion-based				
CBT			50.90	60.0	-	-
Hinton et al. (2009)	Efficacy	completion-based				
CBT			49.92	60.0	-	-
Jespersen et al. (2012)	Effectiveness	completion-based				
Other/ Relaxation music			-	-	-	-
Kananian et al. (2020)	Efficacy	completion-based				
CBT/ CA-CBT+			21.00	0.0	8.30	0.1
Lehnung et al. (2017)	Effectiveness	completion-based				
EMDR			31.30	25.0	-	-
Lindegaard et al. (2021)	Efficacy	completion-based				
CBT/ App-based CBT			40.50	36.7	-	17.0
Morath et al. (2014)	Efficacy	completion-based				
NET			28.00	47.1	-	-
Neuner et al. (2010)	Efficacy	Therapist judgement				
NET			31.10	31.3	-	-
Nickerson et al. (2019)	Effectiveness	completion-based				
Other/ TYS online			38.30	0.0	-	-
Nordbrandt et al. (2020)	Effectiveness	completion-based				
Other/ BBAT + TAU			43.10	53.3	-	9.0
Other/ Physical Activity & TAU			44.6	50.50	-	6.7
Northwood et al. (2020)	Effectiveness	completion-based				
Other/ IPCM			43.85	82.1	-	16.1
Nygren et al. (2019)	Efficacy	completion-based				
CBT/ ICBT			33.00	44.0	36.00	76.0
Paunovic & Öst (2001)	Efficacy	missed appointments				
CBT			-	-	-	-
CBT/ Exposure therapy			-	-	-	-
Renner (2012)	Effectiveness	missed appointments				
Other/ Social Sup. f. sponsorship			-	-	-	-
Renner et al. (2011)	Effectiveness	missed appointments				
CBT			-	40.0	-	-
EMDR			-	47.6	-	-
Other/ CORP			-	52.9	-	-
Röhr et al. (2021)	Effectiveness	completion-based				
CBT/ App-based CBT			33.00	33.8	32.20	19.1
Sonne et al. (2011)	Effectiveness	duration-based				
CBT/ Sertraline + CBT + Co			43.20	37.8	-	7.3
CBT/ Venlafaxine + CBT + Co			44.0	41.70		6.8
Stenmark et al. (2013)	Efficacy	completion-based				
NET			34.50	33.3	-	-
Ter Heide (2016)	Efficacy	missed appointments				
EMDR			43.10	16.7	58.30	19.4
Other/ Stabilization as usual			39.8	38.9	41.70	13.9
Ter Heide et al. (2011)	Efficacy	completion-based				
EMDR			40.00	50.0	30.00	30.0
Other/ Stabilization			43.0	30.0	41.70	30.0
Weine et al. (2008)	Effectiveness	completion-based				
Other/ CAFES			38.50	51.7	86.2	-

Study and Treatment (Label / Description)	% college level education	main country of origin	% insecure AS	Months Host Count.	Main diagnosis
Adenauer et al. (2011)					
NET	-	Central and Southern Asia	87.50	-	PTSD
Buhmann et al. (2016, 2018)					
CBT	-	-	-	-	PTSD
CBT/ CBT + PT + Co	-	-	-	-	PTSD
Other/ PT + PE + Co	-	-	-	-	PTSD
Carlsson et al. (2018)					
CBT/ Stress management	-	Northern Africa and West Asia	0.0	183.6	PTSD
CBT/cognitive restructuring	-	Northern Africa and West Asia	0.0	171.6	PTSD
Goodkind et al. (2020)					
Other/ Refugee well-being project	-	Northern Africa and West Asia	-	2.81	-
Hensel-Dittmann et al. (2011)					
NET	-	-	-	-	PTSD
CBT/ Stress inoculation Training	-	-	-	-	PTSD
Hijazi et al. (2014)					
NET	21.9	Northern Africa and West Asia	-	-	PTSD
Hinton et al. (2004)					
CBT	-	Eastern and South-Eastern Asia	-	-	PTSD
Hinton et al. (2005)					
CBT	-	Eastern and South-Eastern Asia	-	203.4	PTSD
Hinton et al. (2009)					
CBT	-	Eastern and South-Eastern Asia	-	194.9	PTSD
Jespersen et al. (2012)					
Other/ Relaxation music	-	Central and Southern Asia	-	-	PTSD
Kananian et al. (2020)					
CBT/ CA-CBT+	0.0	Central and Southern Asia	91.7	20.9	PTSD
Lehnung et al. (2017)					
EMDR	-	Northern Africa and West Asia	-	-	Trauma
Lindegaard et al. (2021)					
CBT/ App-based CBT	80.0	Northern Africa and West Asia	-	-	Depression
Morath et al. (2014)					
NET	-	Central and Southern Asia	-	-	PTSD
Neuner et al. (2010)					
NET	-	Northern Africa and West Asia	100.0	63.5	PTSD
Nickerson et al. (2019)					
Other/ TYS online	-	Northern Africa and West Asia	27.8	-	No diag.
Nordbrandt et al. (2020)					
Other/ BBAT + TAU	-	Northern Africa and West Asia	-	181.2	PTSD
Other/ Physical Activity & TAU	-	Northern Africa and West Asia		178.8	PTSD
Northwood et al. (2020)					
Other/ IPCM	-	Eastern and South-Eastern Asia	-	49.32	Depression
Nygren et al. (2019)					
CBT/ ICBT	72.0	Northern Africa and West Asia	-	-	Depression
Paunovic & Öst (2001)					
CBT	-	-	0.0	-	PTSD
CBT/ Exposure therapy	-	-	0.0	-	PTSD
Renner (2012)					
Other/ Social Sup. f. sponsorship	-	Europe and Northern America	-	-	-
Renner et al. (2011)					
CBT	-	Europe and Northern America	-	-	-
EMDR	-	Europe and Northern America	-	-	-
Other/ CORP	-	Europe and Northern America	-	-	-
Röhr et al. (2021)					
CBT/ App-based CBT	73.0	Northern Africa and West Asia	53.9	41.9	PTSD
Sonne et al. (2011)					
CBT/ Sertraline + CBT + Co	-	Northern Africa and West Asia	-	169.2	PTSD
CBT/ Venlafaxine + CBT + Co	-	Northern Africa and West Asia	-	181.2	PTSD
Stenmark et al. (2013)					
NET	52.9	Northern Africa and West Asia	39.2	55.40	PTSD
Ter Heide (2016)					
EMDR	80.6	Ambiguous	13.9	120.0	PTSD
Other/ Stabilization as usual	63.9	Sub-Sahara	22.2	106.8	PTSD
Ter Heide et al. (2011)					
EMDR	70.0	-	30.0	121.2	PTSD
Other/ Stabilization	40.0	-	0.0	123.6	PTSD
Weine et al. (2008)					
Other/ CAFES	58.00	Europe and Northern America	-	22.8	PTSD

Study and Treatment (Label / Description)	Treatment Orientation	Treatment Target	Treatment Format	Nr. of Sessions	Duration of Sessions (min)
Adenauer et al. (2011)					
NET	NET	trauma-focused	Individual	12.0	-
Buhmann et al. (2016, 2018)					
CBT	CBT	trauma-focused	Individual	16.0	-
CBT/ CBT + PT + Co	CBT	trauma-focused	Individual	26.0	-
Other/ PT + PE + Co	other	trauma-focused	Individual	10.0	-
Carlsson et al. (2018)					
CBT/ Stress management	CBT	trauma-focused	Individual	27.0	52.5
CBT/cognitive restructuring	CBT	trauma-focused	Individual	19.0	52.5
Goodkind et al. (2020)					
Other/ Refugee well-being project	Other	other	combination		
Hensel-Dittmann et al. (2011)					
NET	NET	trauma-focused	Individual	10.0	90.0
CBT/ Stress inoculation Training	CBT	trauma-focused	Individual	10.0	90.0
Hijazi et al. (2014)					
NET	NET	trauma-focused	Individual	3.0	75.0
Hinton et al. (2004)					
CBT	CBT	trauma-focused	Individual	11.0	-
Hinton et al. (2005)					
CBT	CBT	trauma-focused	Individual	12.0	-
Hinton et al. (2009)					
CBT	CBT	trauma-focused	Individual	12.0	-
Jespersen et al. (2012)					
Other/ Relaxation music	Other	Other	Individual	21.0	60.0
Kananian et al. (2020)					
CBT/ CA-CBT+	CBT	Other	Group	12.0	90.0
Lehnung et al. (2017)					
EMDR	EMDR	trauma-focused	Group	2.0	120.0
Lindegaard et al. (2021)					
CBT/ App-based CBT	CBT	depression	Individual		
Morath et al. (2014)					
NET	NET	trauma-focused	Individual	12.0	90.0
Neuner et al. (2010)					
NET	NET	trauma-focused	Individual		120.0
Nickerson et al. (2019)					
Other/ TYS online	Other	other	Individual	11.0	-
Nordbrandt et al. (2020)					
Other/ BBAT + TAU	Other	trauma-focused	Individual	47.5	60.0
Other/ Physical Activity & TAU	other	trauma-focused	Individual	27.5	60.0
Northwood et al. (2020)					
Other/ IPCM	Other	depression	Individual	78.0	52.5
Nygren et al. (2019)					
CBT/ ICBT	CBT	depression	Individual	7.0	-
Paunovic & Öst (2001)					
CBT	CBT	trauma-focused	Individual	18.0	90.0
CBT/ Exposure therapy	CBT	trauma-focused	Individual	18.0	90.0
Renner (2012)					
Other/ Social Sup. f. sponsorship	Other	other	Individual	-	-
Renner et al. (2011)					
CBT	CBT	other	group	15.0	90.0
EMDR	EMDR	trauma-focused	individual	3.0	-
Other/ CORP	Other	-	group	15.0	90.0
Röhr et al. (2021)					
CBT/ App-based CBT	CBT	trauma-focused	Individual		
Sonne et al. (2011)					
CBT/ Sertraline + CBT + Co	CBT	trauma-focused	Individual	28.0	-
CBT/ Venlafaxine + CBT + Co	CBT		Individual	28.0	-
Stenmark et al. (2013)					
NET	NET	trauma-focused	Individual	10.0	90.0
Ter Heide (2016)					
EMDR	EMDR	trauma-focused	Individual	9.0	80.0
Other/ Stabilization as usual	other	trauma-focused	Individual	12.0	60.0
Ter Heide et al. (2011)					
EMDR	EMDR	trauma-focused	Individual	11.0	90.0
Other/ Stabilization	other	trauma-focused	Individual	11.0	60.0
Weine et al. (2008)					
Other/ CAFES	other	Other	group	9.0	90.00

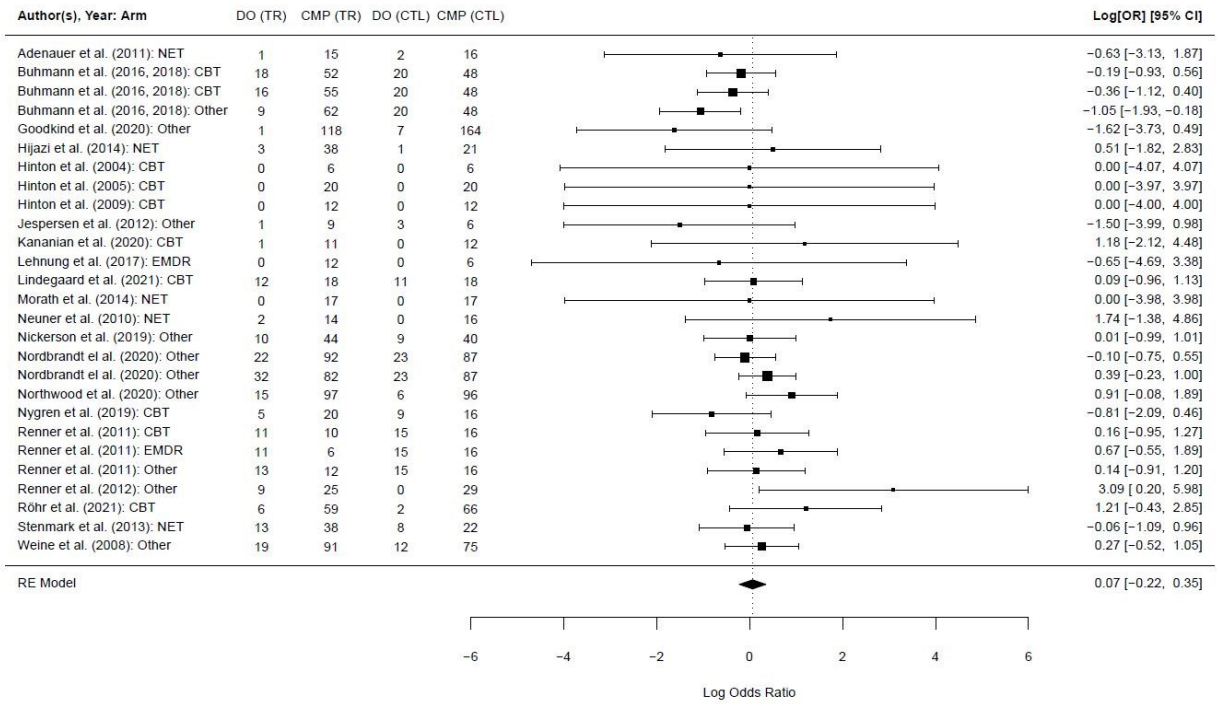
Study and Treatment (Label / Description)	Manuali-zation	Treatment setting	Medication allowed	Cultural Adaption	Therapist Experience level	Interpreter
Adenauer et al. (2011)						
NET	yes	University affiliated	yes	yes	experienced	yes
Buhmann et al. (2016, 2018)						
CBT	yes	Outpatient	yes	no	experienced	yes
CBT/ CBT + PT + Co	yes	Outpatient	yes	no	experienced	yes
Other/ PT + PE + Co	no	Outpatient	yes	yes	No therapist	yes
Carlsson et al. (2018)						
CBT/ Stress management	yes	Outpatient	yes	-	experienced	yes
CBT/cognitive restructuring	yes	Outpatient	yes	-	experienced	yes
Goodkind et al. (2020)						
Other/ Refugee well-being project	yes	online	-	-	No therapist	-
Hensel-Dittmann et al. (2011)						
NET	yes	University affiliated	-	-	mixed	yes
CBT/ Stress inoculation Training	yes	University affiliated	no	-	experienced	yes
Hijazi et al. (2014)						
NET	yes	online	-	-	experienced	no
Hinton et al. (2004)						
CBT	yes	Outpatient	yes	yes	experienced	no
Hinton et al. (2005)						
CBT	yes	Outpatient	yes	yes	experienced	no
Hinton et al. (2009)						
CBT	yes	Outpatient	yes	yes	experienced	no
Jespersen et al. (2012)						
Other/ Relaxation music	no	University affiliated	yes	yes	No therapist	-
Kananian et al. (2020)						
CBT/ CA-CBT+	yes	University affiliated	-	yes	experienced	no
Lehnung et al. (2017)						
EMDR	yes	No information	-	-	-	yes
Lindegaard et al. (2021)						
CBT/ App-based CBT	yes	online	no	yes	Trainee	no
Morath et al. (2014)						
NET	yes	University affiliated	yes	-	experienced	yes
Neuner et al. (2010)						
NET	yes	University affiliated	yes	no	experienced	yes
Nickerson et al. (2019)						
Other/ TYS online	yes	online	-	yes	No therapist	no
Nordbrandt et al. (2020)						
Other/ BBAT + TAU	yes	Outpatient	yes	yes	mixed	yes
Other/ Physical Activity & TAU	yes	Outpatient	yes	yes	mixed	yes
Northwood et al. (2020)						
Other/ IPCM	no	Refugee institution	yes	yes	mixed	yes
Nygren et al. (2019)						
CBT/ ICBT	yes	online	yes	yes	Trainee	no
Paunovic & Öst (2001)						
CBT	yes	University affiliated	yes	no	experienced	no
CBT/ Exposure therapy	yes	University affiliated	yes	no	experienced	no
Renner (2012)						
Other/ Social Sup. f. sponsorship	no	other	-	yes	No therapist	no
Renner et al. (2011)						
CBT	no	Refugee institution	-	yes	experienced	yes
EMDR	yes	Refugee institution	-	-	experienced	yes
Other/ CORP	yes	Refugee institution	-	-	Trainee	no
Röhr et al. (2021)						
CBT/ App-based CBT	yes	online	-	yes	No therapist	no
Sonne et al. (2011)						
CBT/ Sertraline + CBT + Co	yes	Outpatient	yes	yes	experienced	yes
CBT/ Venlafaxine + CBT + Co	yes	Outpatient	yes	yes	experienced	yes
Stenmark et al. (2013)						
NET	yes	other	yes	no	mixed	yes
Ter Heide (2016)						
EMDR	yes	Outpatient	yes	no	experienced	yes
Other/ Stabilization as usual	yes	Outpatient	yes	no	experienced	yes
Ter Heide et al. (2011)						
EMDR	yes	Outpatient	yes	no	experienced	yes
Other/ Stabilization	no	Outpatient	yes	no	experienced	yes
Weine et al. (2008)						
Other/ CAFES	yes	other	-	yes	No therapist	no

Notes. N = number of patients; Int = intervention group; DO = Dropout; DR = Dropout rate; CG = control group; M = Mean; CBT = Cognitive-Behavioral Therapy; EMDR = Eye Movement Desensitization and Reprocessing; NET = Narrative Exposure Therapy; TAU = Treatment-as-usual; PT = psychopharmacological treatment; PE = Psychoeducation; Co = consulting; CA-CBT+ = Culturally Adapted CBT plus Problem Management; TYS = Tell your Story; BBAT = Basic Body Awareness Therapy; IPCM = intensive psychotherapy and case management; ICBT = Internet-based cognitive behavioral therapy; CORP = Cultural-Sensitive and Resource Oriented Peer Group; CAFES = Coffee and Families Education and Support; AS= asylum status; Months Host Count. = Months since arrival in host country; PTSD = Posttraumatic Stress Disorder; Nr. = number; min = minutes.

A5. Forest Plot of *OR*

Figure A5.1

Forest Plot of log OR



Note. DO (TR) = number of dropout treatment condition, CMP (TR) = number of completer treatment condition, DO (CTL) = number of dropout control condition, CMP (CTL) = number of completer control condition, CI = Confidence Interval, Log *OR* = log transformed Odds Ratio, CBT = Cognitive-Behavioral Therapy; NET = Narrative Exposure Therapy, EMDR = Eye Movement Desensitization and Reprocessing.

For visibility, we used log *OR* in the forest plot as some studies had a small sample size and thus showed an extremely large CI for the raw *OR*. *OR* could not be calculated for studies that only include an active comparator as control condition.

A6. Risk of bias assessment (Cochrane Risk of Bias Assessment Tool)

Risk of bias: review authors' judgements about each risk of bias item for each included study

Adenauer et al. (2011)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quotes: "randomized into the two groups using a computer-generated list of random numbers" Comment: Insufficient information provided on allocation concealment.
Deviations from intended intervention (performance bias)	High risk	Quote: "As this study focuses on brain changes through psychotherapy rather than examining the clinical efficacy of the treatment, we restricted all analyses to the sample of study completers." Comment: From n = 16 allocated to NET only n=11 were analyzed. From n = 18 allocated to WLC only n=8 were analyzed. Exclusion was mostly due to poor MEG data quality or no MEG assessment but funded statement based on these data can't be made
Missing outcome data (attrition bias)	Low risk	Quotes: "Excluded from analysis because of poor MEG data quality" "Deportation" Comment: missing outcome data occurred for documented reasons that are unrelated to the outcome (most cases: poor MEG data quality). Dropout balanced across intervention groups with similar reasons.
Measurement of the outcome (detection bias)	Low risk	Quotes: "Posttests with the NET patients were scheduled 4 months after the end of therapy. For the participants in the WLC group, the time spans between pre- and posttests were individually matched with the NET group. Post-test included the same instruments as used in the pre-test and were carried out by interviewers who were blind to treatment condition"
Selection of the reported results (reporting bias)	Low risk	Quotes: "Registration of the clinical trial: Number: NCT00563888" Comment: Authors preregistered clinical trial; specified all outcome data and reported all outcome data in published report. There were no multiple measurements (analysis), where only a subset was reported"
Researcher allegiance	Some concerns	Comment: Treatment manual by Schauer and Neuner. Both are (co-)authors of the published report.
Overall bias	High risk	Due to deviations from the intended intervention

Buhmann et al. (2016, 2018)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quotes: "The randomization sequence was computer generated by the Department of Biostatistics at University of Copenhagen, which was not otherwise involved in the research project" Quotes: "Allocation was concealed by using sequentially numbered sealed envelopes. The envelopes were kept in an office physically separate from the clinic and were administered by secretaries, who were not associated with the research project."
Deviations from intended intervention (performance bias)	low risk	Quotes: "It was not deemed possible to mask the patients, physician or psychologists to the treatment group because of the substantial differences between the treatment modalities" Quote: "Two patients in the group assigned to receive both psychotherapy and medical treatments only received psychotherapy. All patients received the planned treatment in the group receiving only medical treatment. Six patients in the group assigned to receive only psychotherapy also received treatment with sertraline or mianserin, and 27% of patients in this group received another type of antidepressant." Comment: All patients received allocated intervention. Changes are consistent with what would occur outside the trial Quote: "To conduct intention-to-treat analyses with all 280 patients, a full information maximum likelihood (FIML) was used in analyses, which included both pre- and post-treatment scores"

Missing outcome data (attrition bias)	Some concerns	Quotes: "Pretreatment scores were available for 280 patients, and post-treatment scores were available for 201–226 patients (226 for HTQ). … "To conduct intention-to-treat analyses with all 280 patients, a full information maximum likelihood (FIML) was used in analyses" Comment: but results reported only refer to completers. No information on dropouts
Measurement of the outcome (detection bias)	Low risk	Quotes: "A masked outcome measure was obtained by rating all patients with HRSD and HRSA at baseline and follow-up. No similar observer-rating existed for PTSD. A group of medical students not otherwise involved in the treatment undertook the masked ratings and met regularly to increase rater reliability."
Selection of the reported results (reporting bias)	Low risk	Quotes: "registered with Clinicaltrials.gov, NCT00917397, EUDRACT no. 2008-006714-15" Comment: Authors preregistered clinical trial; specified all outcome data and reported all outcome data in published report"
Overall bias	Some concerns	Due to missing outcome data

Carlsson et al. (2018)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "A computer-generated randomization sequence was obtained from the Department of Biostatistics at the University of Copenhagen." …" The randomization was stratified by gender and level of severity of PTSD symptoms measured on the HTQ" Quote: "Allocation was concealed by using sequentially numbered sealed envelopes" …" When the clinicians had obtained informed consent from a participant, they received the allocation by calling a secretary at Mental Health Centre Ballerup with no other contact to CTP, administering the randomization envelopes."
Deviations from intended intervention (performance bias)	Some concerns	Quote:"Neither clinicians nor patients were blinded in this study." Comment: no changes from assigned intervention that are inconsistent with what could occur outside the trial context Quote: "To conduct intention-to-treat analyses the regression analyses were conducted using Full Information Maximum Likelihood (FIML) which incorporates all available information including pre-treatment scores for participants without post-treatment scores"
Missing outcome data (attrition bias)	Low risk	Quote: "Full Information Maximum Likelihood (FIML) which incorporates all available information including pre-treatment scores for participants without post-treatment scores." Comment: statistical analysis used to impute missing data and to conduct intention-to-treat analysis
Measurement of the outcome (detection bias)	Some concerns	Quote: "The measures were all self-report except GAF-S and-F, which were completed by the medical doctor in charge of the treatment and the HAM-D and HAM-A, which were completed by raters blinded to the time of the interview (pre-treatment or posttreatment) and to the intervention group." Quote: "it was not considered possible to blind clinicians or participants and only the ratings HAM-A and -D were blinded."
Selection of the reported results (reporting bias)	Low risk	Quote: "project is registered with ClinicalTrial.gov (NCT01362543) Comment: Authors preregistered clinical trial; specified all outcome data and reported all outcome data in published report. There were no multiple measurements (analysis), where only a subset was reported"
Overall bias	Some concerns	Due to measurement of the outcome and deviations from intended intervention

Goodkind et al. (2020)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "were randomized at the household level into intervention and waitlist control groups." "household ID numbers were placed into a box. ID numbers were color-coded by two stratification variables (three national/regional origin groups and absence or presence of clinically significant PTSD symptom score of at least

		one adult in the household to ensure that households with more serious distress were distributed evenly in intervention and control groups." Quote: "study's community advisory council decided that random assignment should occur at a public meeting, to which all participants were invited" Comment: Only ID could be seen for person performing allocation. Allocation was only visible after completion of allocation process.
Deviations from intended intervention (performance bias)	Low risk	Quote: "all (in the RWP group) but three attended at least one Learning Circle and all but two had at least 2 hours of face-to-face contact with their advocate." Comment: participants and personnel not blinded. Quote: "All analyses were on the full intent-to-treat sample." "For outcome analyses, missing values were handled in two ways, through expectation maximization (EM) and FIML estimation"
Missing outcome data (attrition bias)	Low risk	Quote: "Of the total possible 1,160 interviews across four time points, 32 (2.8%) could not be conducted. Including data missing due to missed interviews and skipped items, 2.0% of the data matrix was missing, apparently completely at random"
Measurement of the outcome (detection bias)	Some concerns	Quote: "The multiple languages and cultures represented in this study raise concerns related to measurement validity. Despite intensive efforts to ensure accurate cultural and linguistic translation of measures, it is possible that we did not measure emotional distress in the ways that were most relevant to participants" Comment: no information on blinding of assessors given; measures pre-specified; same measures for both groups
Selection of the reported results (reporting bias)	Low risk	Quote: "Multilevel growth modeling was the primary analytic approach used to examine effects of the intervention on changes in outcomes over time through 6-month follow up." Comment: no information on pre-registration but detailed information on planned outcome measures Comment: multiple measures over different time points (pre, mid post, follow-up) are made but not only a subset is reported on the basis of results
Overall bias	Some concerns	Due to measurement of the outcome

Hensel-Dittmann et al. (2011)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "Participants were matched pairwise according to gender, age, and region of origin and were then allocated to NET or SIT by flipping a coin."
Deviations from intended intervention (performance bias)	Low risk	Quote: "All sessions were videotaped and randomly analyzed in order to ensure treatment adherence. Treatment implementation was also discussed in team sessions." Comment: n=3 dropouts during NET and SIT. Consistent with what could occur outside the trial context.
Missing outcome data (attrition bias)	Low risk	Quote: "At pretest, data for the whole sample (n = 28) were available. At the 4-week posttest, data were available for 21 participants (75%), at the 6-month follow-up for 22 (78.6%), and at the 1-year follow-up for 15 (53.6%)." Comment: intention-to-treat analysis used to correct for missing data. Analyzed data from all participants enrolled (n=28) using mixed models procedure
Measurement of the outcome (detection bias)	Low risk	Quote: "We aimed to keep the assessors blind to the treatment conditions of the subjects; however, occasionally the treatment condition was revealed to the rater by responses from the patient."
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements and analyzed are reported.
Overall bias	Some concerns	Due to Selection of reported results.

Hijazi et al. (2015)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quote: "The computerized scheme was stratified by recruitment site (agency) and assistant, and randomized the two conditions in blocks of six in a 2:1 ratio (intervention: control)" Quote: "the assistant telephoned the participant and asked if he or she was willing to continue participating in the study. If so, the assistant (heretofore blind to condition assignment) opened a sealed envelope and informed the participant when he or she would be getting the treatment."
Deviations from intended intervention (performance bias)	Low risk	Quote: "For the brief NET intervention, the therapists followed a structured manual (Schauer et al., 2005), which was adapted to three sessions, lasting 60 to 90 minutes each." Comment: no deviations form intended intervention reported
Missing outcome data (attrition bias)	Low risk	Quote: "Fully 39 of the 41 participants (95.1%) assigned to brief NET completed all three sessions" … "Of the 63 randomized participants, 62 (98.4%) provided some follow-up "…" Our primary analyses were intent-to-treat, meaning that we retained all 63participants, regardless of how many intervention or follow-up assessment sessions they completed. Any missing follow-up data were replaced using the multiple imputation procedure in SPSS."
Measurement of the outcome (detection bias)	Some concerns	Quote: "All participants (including controls) were mailed follow-up assessment measures and stamped, return envelopes 2 months and 4 months after baseline." Comment: Comment: participant-reported outcome, therefore could be influenced by knowledge of the assigned intervention
Selection of the reported results (reporting bias)	Low risk	Quote: "registered with clinicaltrials.gov (NCT01288690)" Comment: Quality of sleep was intended to be assessed with the Karolinska Institute Sleep Questionnaire"; Daily functioning assessment was intended. Both part of secondary outcome measures. Not reported in study" Comment: all other outcome measures pre-specified Comment: no outcome domains measured in multiple ways, no multiple analyzed data and selective reporting
Overall bias	Some concerns	Due to measurement of the outcome.

Hinton et al. (2004)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "The patients were randomly assigned to two cohorts of 6 each, one being immediate (Group 1) and the other delayed CBT treatment (Group 2)." Comment: no further information on randomization process is given Comment: No information on concealment given Comment: no information on baseline differences given, but no detectable baseline differences from table
Deviations from intended intervention (performance bias)	Low risk	Quote: "The first author led the CBT sessions. Vietnamese social workers and staff provided translation and cultural consultation. Individual CBT was offered across 11 weekly sessions. During CBT, we stressed eight core elements" Comment: no deviation from intended intervention detectable
Missing outcome data (attrition bias)	Low risk	Comment: data for all 12 participants at 3 time points are provided.
Measurement of the outcome (detection bias)	Some concerns	Quote: "The participants completed the HTQ, ASI, and HSCL at three time points: (a) at pretreatment (first assessment); (b) after Group 1 had undergone 11 sessions of CBT (second assessment); and (c) after Group 2 had undergone 11 sessions of CBT (third assessment)." Comment: participant-reported outcome, therefore could be influenced by knowledge of the assigned intervention.
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report. Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results

Researcher allegiance	Some concerns	Comment: "manual-based protocol developed by the first author (cf. Hinton, Pham, et al., 2004)." (Information from Hinton et al. (2005), as not given in detail in Hinton et al. (2004))
Overall bias	Some concerns	Due to Randomization Process, measurement of outcome, selection of reported results

Hinton (2005)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Some concerns	Quote: "Patients were randomly assigned to either the Immediate Treatment (IT) or the Delayed Treatment (DT) Group" … "Eligible patients who agreed to participate were stratified by gender, with random allocation to either the IT or the DT Group decided by a coin toss." Comment: no information given on concealment of allocation Quote: "For both groups, none of the scores differed significantly at baseline."
Deviations from intended intervention (performance bias)	Low risk	Quote: "The first author (D.H.), who is fluent in Cambodian, conducted the CBT sessions, utilizing a manual-based protocol developed by the first author" …" All randomized patients completed the study" Comment: no deviations form intended intervention reported
Missing outcome data (attrition bias)	Low risk	Quote: "All randomized patients completed the study, and there were no missing data."
Measurement of the outcome (detection bias)	Low risk	Quote: "Blind to treatment condition, all assessments were made by a Cambodian bicultural worker (D.C., V.P.) with over 2 years of mental health experience."
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Researcher allegiance	Some concerns	Quote: "The first author (D.H.), who is fluent in Cambodian, conducted the CBT sessions, utilizing a manual-based protocol developed by the first author (cf. Hinton, Pham et al., 2004)"
Overall bias	Some concerns	Due to Randomization process and selection of the reported results.

Hinton (2009)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Some concerns	Quote: "patients … were stratified by gender, with random allocation to either initial or delayed treatment decided by a coin toss." Comment: no information given on concealment of randomization Quote: "For both groups, neither psychometric nor physiological scores differed significantly at baseline (no *P*s < 0.05)."
Deviations from intended intervention (performance bias)	Low risk	Quote: "The first author (DH), who is fluent in Cambodian, conducted or co-led the CBT sessions, utilizing a manual based protocol developed by our team [17,18,27,28]. CBT was offered across 12 weekly sessions…" Quote: "24 randomized patients completed the study, and there were no missing data." Comment: no deviations form intended intervention reported
Missing outcome data (attrition bias)	Low risk	Quote: "All 24 randomized patients completed the study, and there were no missing data."
Measurement of the outcome (detection bias)	Low risk	Quote: "Blind to treatment condition, all assessments were made by a Cambodian bicultural worker with over 2 years of mental health experience"
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Researcher allegiance	Some concerns	Quote:" The first author (DH)… conducted or co-led the CBT sessions, utilizing a manual based protocol developed by our team"
Overall bias	Some concerns	Due to randomization process and selection of reported results.

Jespersen et al. (2012)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	High risk	Quote: "Study participants were recruited consecutively, and assigned to the intervention or control condition based on gender. To match for gender, every other male participant was given the intervention condition, so that the first male (M1) went to the intervention group, M2 to the control group, M3 to the intervention group, etc. A coin was tossed to decide the assignment of the first" Comment: differences in trauma scores
Deviations from intended intervention (performance bias)	Some concerns	Quote: "blinding of the participants and researcher was not possible, and this is a potential source of bias." Comment: Online one person dropped out in the intervention and 3 in the control. No "substantial impact". No exclusion or analysis in the wrong group "just" dropout. No deviation can be detected
Missing outcome data (attrition bias)	Some concerns	Quote. "During the study, 4 persons dropped out leaving a total sample of 15 participants." Comment: Completer analysis. Therefore, no analysis that correct for bias
Measurement of the outcome (detection bias)	Some concerns	Quote: "After week one and week two, participants completed the sleep quality measure." Comment: All measures appropriate and suitable for the outcome measure. Self-rated measures
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Overall bias	High risk	Due to problems in the randomization process.

Kananian et al. (2020)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "If a participant was verified as eligible, they were randomized to the treatment group or the waitlist control condition using a 1:1 randomization ratio; as such, 24 participants were randomly assigned to the CA-CBT+ group or to the WLC group." Comment: no information on allocation sequence concealment
Deviations from intended intervention (performance bias)	Low	Quote: "Although weekly supervision was provided by the senior author to ensure treatment integrity, it was not possible to take recordings from the sessions, as the participants were suspicious about the loss of privacy and possible sanctions from governmental authorities. Adherence was only assessed by using intervention checklists for therapists. " Comment: Statistical analyses were based on intent-to-treat data.
Missing outcome data (attrition bias)	Low	Quote: "One participant dropped out of treatment after the first session because of time constraints due to a new job."
Measurement of the outcome (detection bias)	Low	Quote. "The assessments were conducted at baseline and posttreatment for both groups as well as at 1-year posttreatment for the CA-CBT+ group." Quote. "Diagnostic interviews and assessments were conducted by an independent Farsi-speaking postgraduate psychologist who was blind to treatment allocation
Selection of the reported results (reporting bias)	Low	Quote. "trial registration: DRKS00016154" Comment: all other outcome measures pre-specified Comment: no outcome domains measured in multiple ways, no multiple analyzed data and selective reporting
Researcher allegiance	Some concerns	Quote: "The group program was based on the *Manual for Culturally Adapted Cognitive Behavioral Therapy* (Hinton, 2012)" Comment: Hinton is co-author of the study
Overall bias	Some concerns	Due to randomization process

Lehnung et al. (2017)

Bias	Authors' judgement	Support for judgement

Randomization process (selection bias)	Some concerns	Quote: "…with no statistical differences between groups" "The group was then divided randomly in two. Because of personal reasons, three people who had first been assigned to Group 2 turned up for treatment together with Group 1, so Group 1 (N = 12) was larger than Group 2 (N = 6). At best, randomization can only be considered partial." Comment: no information on concealment of allocation
Deviations from intended intervention (performance bias)	High risk	Quote: "Because of personal reasons, three people who had first been assigned to Group 2 turned up for treatment together with Group 1, so Group 1 (N = 12) was larger than Group 2 (N = 6)." Comment: deviation from intended intervention due to trial context (WLC) Comment: after patient moved to intervention group, "as treated" analysis was conducted. Means patients that self-relocated were analyzed as intervention group members Comment: Thee people were assigned to WLC and moved to intervention group. Therefore, not balanced Comment: Number of participants who were analyzes in the wrong group n = 3. Total in one group of n = 9. Therefore 33.3% self-relocation → might be substantial impact on results
Missing outcome data (attrition bias)	Low risk	Quote: "Time 3 (T3) assessment was planned to be conducted at 3 months for those who could be located. Unfortunately**,** after 3 months, only two persons could still be traced and were still in the region; all the others had moved on. For these two, no further formal assessment was done." Comment: Comment: reason for missingness given. No relation between reasons for missingness and health status. Therefore unlikely, that missingness in the outcome was influenced by true value
Measurement of the outcome (detection bias)	Some concerns	Comment: authors used self-report tools. Participants completed the outcome measures themselves. Study participants were aware of the assigned intervention
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Overall bias	High risk	Due to Deviations from intended intervention

Lindegaard et al. (2021)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "participants were subsequently randomized to either of the two conditions through a random number generator (www.random.org)"
Deviations from intended intervention (performance bias)	Low risk	Comment: no deviations from intended intervention possible due to study design (app-based CBT) Quote: "The analysis made use of all available data through the use of full information maximum likelihood estimation (FIML), thus making it a full intention-to-treat analysis."
Missing outcome data (attrition bias)	Low risk	Quote: "In total, 12 participants in the treatment group and 11 participants in the control group did not complete the post-treatment assessment, yielding a dropout rate of 39%." Comment: results are not biased by missing outcome data, because of ITT analysis. All randomized participants were included in analysis"
Measurement of the outcome (detection bias)	Some concerns	Quote: "All measures were administered at pre-treatment, three weeks after treatment start, and post-treatment." Comment: no blinding of outcome assessment because outcome assessment was self-administered.
Selection of the reported results (reporting bias)	Low risk	Quote: "preregistered at clinicaltrials.gov, ID number NCT03496350." Comment: no multiple outcome measures for one domain. Results for all measured time-points are available.
Overall bias	Some concerns	Due to measurement of the outcome.

Morath (2014)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "…were randomly assigned to either a treatment (NET group: n = 17) or a waitlist control condition (WLC group: n = 17). Comment: no further information given Comment: no information on concealment of allocation
Deviations from intended intervention (performance bias)	Low risk	Comment: blinding of personal not possible due to study design Comment: no deviation from intended intervention detectable Comment: data from all allocated patients at post treatment assessment available
Missing outcome data (attrition bias)	Low risk	Quote: "with respect to missing values analyses were done using mixed models procedure" Comment: missing value mostly immune data Comment: analyses were conducted with all randomized participants
Measurement of the outcome (detection bias)	Low risk	Quote: "The clinicians who performed the outcome evaluations were never the same as the clinician who performed the baseline evaluation or the psychotherapeutic intervention; moreover, the two follow up evaluations were performed by different clinicians" Quote: "diagnosticians were blind with regard to group membership at baseline and at both posttests."
Selection of the reported results (reporting bias)	Low risk	Quote: "The study was registered at http://dinicaltrials.gov/ct2/show/NCT01206790." Comment: all outcome measures are pre-specified
Researcher allegiance	Some concerns	Quote: "The NET group received 12 weekly treatment sessions of 90 min (Schauer et al., 2011a). Comment: Schauer, M. is co-author of study
Overall bias	Some concerns	Some concerns: due to Risk arising from the randomization process

Neuner (2010)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "Participants were randomized into the two groups using a block permutation procedure with blocks of four patients." Comment: no information on concealment of allocation Quote: "There was no significant difference in the characteristics between the two groups, as confirmed by Pearson chi-square tests, Fisher's exact tests, and *t* tests."
Deviations from intended intervention (performance bias)	Low risk	Quote: "No major deviations from treatment protocol were detected."
Missing outcome data (attrition bias)	High risk	Quote: "Two patients from the NET group but no patient from the TAU group dropped out of the study." Quote: "One NET treatment could not be carried out according to the manual because a severe hyperventilation syndrome interfered with narrative exposure. This patient was excluded from the study. Another patient dropped out of the NET group before the first exposure session because he refused to continue." Quote: "we chose to apply mixed-effects models that allow the inclusion of all available data without the arbitrary replacement or imputation of missing values."
Measurement of the outcome (detection bias)	Low risk	Quote: "We aimed at keeping interviewers blind to each participant's condition. However, occasionally, the participants revealed their condition to the interviewer despite instructions not to do so (e.g. by asking for treatment within the institution)."
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Researcher allegiance	Some concerns	Quote: "NET treatment was carried out according to the manual (Schauer et aI., 2005)" Quote: "Frank Neuner and Maggie Schauer supervised the treatment." Comment: Neuner, F. and Schauer, M. (first and last) authors of the study
Overall bias	High risk	Due to missing outcome data.

Nickerson (2020)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quote: "participants were randomized to a treatment condition using a computer-generated number sequence embedded in the website, and were automatically directed to a webpage that informed them of the results of the randomization." Comment: computer-generated randomization
Deviations from intended intervention (performance bias)	Low risk	Quote: "Participants in the TYS group completed a mean of 4.76 (S.D. = 3.86) modules in the online intervention" Comment: there were changes from assigned intervention that are inconsistent with the trial protocol (n=5, 0 modules), but these are consistent with what could occur outside the trial context.
Missing outcome data (attrition bias)	Low risk	Quote: "All participants who had completed at least one assessment point were included, and consistent with intent to treat analyses, participants were included in their randomized group irrespective of the number of modules they had completed."
Measurement of the outcome (detection bias)	Some concerns	Quote: "The post-intervention and follow-up assessments were completed online at 4 and 8 weeks after baseline, respectively" Comment: Participants completed the outcome measures themselves. Study participants were aware of the assigned intervention"
Selection of the reported results (reporting bias)	Low risk	Quote: "The trial was prospectively registered on the Australia and New Zealand Clinical Trial Registry (Trial ID ACTRN12616000815460)" Comment: all outcome measures pre-specified
Researcher allegiance	Some concerns	Comment: Tell Your Story is an online intervention implemented by the authors of the study
Overall bias	Some concerns	Due to measurement of the outcome

Nordbrandt et al. (2020)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quote: "Randomization was conducted by sequentially, numbered, sealed envelopes, stratified by gender and level of PTSD symptoms by staff unconnected to patient treatment." Quote:" The Department of Biostatistics at University of Copenhagen, not otherwise involved in the trial, produced a computer-generated randomization sequence and drew up an anonymous randomization list"
Deviations from intended intervention (performance bias)	Some concerns	Quote: "Both interventions followed manuals developed in cooperation with physiotherapists experienced in working with the target group." Quote: "This analysis was carried out both as the primary intention-to-treat analyses of all participants who completed pre-treatment ratings, and in addition on a reduced sample (per-protocol analyses). "
Missing outcome data (attrition bias)	Low risk	Quote: "Respectively 23, 22 and 32 (C/B/M) patients dropped out of treatment before completing the post-treatment assessment." Comment: intention-to-treat analysis used to correct for missing data. Authors also conducted Per-Protocol analysis.
Measurement of the outcome (detection bias)	Some concerns	Quote: "The primary outcome was severity of PTSD symptoms measured on the self-administered Harvard Trauma Questionnaire (HTQ)" Comment: also, secondary outcomes were self-administered Quote: "Hamilton Depression and Anxiety (HAM D + A) interviews were conducted before and after treatment by a team of medical students, blinded to intervention group and time of the interview. (…) The clinicians were not given access to the results of the Hamilton interviews."
Selection of the reported results (reporting bias)	Low risk	Quote: "The study was registered with Clinicaltrials.gov (NCT01955538) October 7, 2013." Comment: all outcome measures pre-specified
Overall bias	Some concerns	Due to deviations from intended intervention and Measurement of the outcome

Northwood (2020)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quote: "A coin toss by a research assistant otherwise uninvolved in the study was used to determine group allocation."
Deviations from intended intervention (performance bias)	Low risk	Quote: "Of these 187 (87.4%) completed all four assessments; 193 (90.2%) completed the baseline and at least one follows up assessment." Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Low risk	Quote: "Overall, 214 participants were enrolled in the study and completed a baseline assessment. Of these 187 (87.4%) completed all four assessments; 193 (90.2%) completed the baseline and at least one follow- up assessment." Quote: "All analyses were conducted according to intention-to-treat methods"
Measurement of the outcome (detection bias)	Low risk	Quote: "Outcome assessors (research staff not involved in the intervention who administered the measures) were blind to group assignment." Quote: "Assessors had no contact with CVT providers to minimize breaches to blindness and bias "
Selection of the reported results (reporting bias)	Low risk	Quote: "Trial registration: clinicaltrials.gov Identifier: NCT03788408. Registered 20 Dec 2018. Retrospectively registered. " Comment: all outcome measures pre-specified
Overall bias	Low risk	No risk of bias can be detected

Nygren et al., (2019)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quote: "Randomization was performed through a random numbers generator (www.random.org), according to a 1:1 ratio." Comment: internet-based randomization, therefore a concealment of sequence allocation is to be expected
Deviations from intended intervention (performance bias)	Low risk	Quote: "Dropout was defined as those patients not completing the posttreatment assessment regardless of number of modules completed. In total, five patients in the treatment group and nine in the control group did not complete the posttreatment assessment, yielding a dropout rate of 20% in the treatment group and total dropout rate of 28%." Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Low risk	Quote: "To account for missing data, multiple imputation (MI) was performed using SPSS 24. This type of estimation has been shown to provide unbiased results under the assumption that data are missing at random. Quote: "given that we could not find any pattern in the missing data with regard to pretreatment symptom levels or sociodemographic variables, the assumption of MAR seemed justified. Twenty imputed data sets were specified, and the parameter estimates were pooled over the set of 20 analyses." Comment: assumption that missingness in the outcome does not depend on its true value therefore multiple imputation seems justified
Measurement of the outcome (detection bias)	Some concerns	Quote: "the patients completed the self-report measures online" Comment: Participants completed the outcome measures themselves. Study participants were aware of the assigned intervention
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Researcher allegiance	Some concerns	Quote: "The treatment program was based on protocols from two previous studies of ICBT for depression from the research group (Andersson et al., 2005; Johansson et al., 2012)." Comment: Andersson and Johansson are (Co-) authors of the present study
Overall bias	Some concerns	Due to Measurement of the outcome and Selection of the reported results

Paunovic & Öst (2001)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "The patients were randomly assigned to two treatments, CBT or E, with the provision that no more than two consecutive patients could be randomized to the same condition." Comment: no information on concealment of sequence allocation
Deviations from intended intervention (performance bias)	Low risk	Quote: "Four clients, one in the E-group and three in the CBT-group, were excluded at an early stage of treatment. The client from the E-group and two of the clients from the CBT-group missed a third consecutive appointment session 2, 3 or 4, and after that they were excluded from the treatment. One client from the CBT-group was excluded due to hostile behaviors towards the therapist during the first session." Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Some concerns	Comment: n=4 participants were excluded from the study. Analysis only with completers
Measurement of the outcome (detection bias)	Some concerns	Comment: combination of assessor ratings and self-report scales. For assessment with assessors, no information on blinding. For self-report scales: Study participants were aware of the assigned intervention
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Overall bias	Some concerns	Due to Randomization process, Missing outcome data, Measurement of the outcome, Selection of the reported results

Renner (2011)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "Participants were assigned to the above-mentioned conditions at random." Comment: no further information given Comment: no information on concealment of sequence allocation
Deviations from intended intervention (performance bias)	Low risk	Quote: "All group sessions took place once a week and lasted for 90 minutes. Following a self-help paradigm and in the absence of a fixed schedule or program, the leaders of the CROP-Groups were free to follow their own ideas and to respond spontaneously to the group members' needs" Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Some concerns	Comment: "In addition it must be noted that in all the groups there was a substantial drop out rate." Comment: Dropout rates between 52% and 77.4% Comment: non-adherence could be related to the true value, but it is unlikely (due to given reasons for dropout)
Measurement of the outcome (detection bias)	Some concerns	Comment: Participants completed the outcome measures themselves. Study participants were aware of the assigned intervention
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Overall bias	Some concerns	Due to Randomization process, Missing outcome data, Measurement of the outcome, Selection of the reported results

Renner (2012)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "… the participants were randomized to the intervention and the control groups." "The study followed a randomized controlled design as it is shown in Figure 2." Comment: no information on concealment of sequence allocation
Deviations from intended intervention (performance bias)	Low risk	Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Some concerns	Quote: "Out of the N = 63 initial participants, a total of N = 54 (N = 25 in the intervention and N =29 in the waiting-list-control-group) also were available at t2 and thus could be included into data analysis Comment: no analysis used to correct for a possible bias due to missing data
Measurement of the outcome (detection bias)	Some concerns	Comment: Participants completed the outcome measures themselves. Study participants were aware of the assigned intervention
Selection of the reported results (reporting bias)	High risk	Comment: no information on pre-registration of the RCT (and couldn't be found on ClinicalTrials.gov). Outcome measurements pre-specified in report Quote: „only participants with an HTQ-score ≥ 1.75 had responded positively to the intervention (Renner, Banninger-Huber, & Peltzer, accepted). Thus, we decided to reanalyze the present data, taking only traumatized individuals into account." Comment: Multiple eligible outcome analyses. It can't be ruled out that the reported result are likely to have been selected on the basis of the results. Authors report outcome measurements selectively that are favorable to the experimental intervention. But results reported for total sample as well.
Overall bias	High risk	Due Selection of the reported results

Röhr et al. (2021)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Low risk	Quote: "study participants were randomly allocated (1:1) to the intervention group (IG) or control group (CG), which received a psychoeducational brochure using randomized permuted blocks of 6, stratified by age and sex, which ensured both balance in sample size across groups and control of important covariates. An external, independent statistician generated the randomization block lists with a respective computer program (blockrand package written for R [R Foundation for Statistical Computing])."
Deviations from intended intervention (performance bias)	Low risk	Comment: Participants probably weren't aware of their assigned intervention (IG vs. KG) is App vs. Reading material. Quote: "Therefore, we multiple-imputed missing baseline data using the algorithm of chained equations implemented in Stata (StataCorp LLC) with all sociodemographic variables and baseline assessments of outcome variables as predictors. The resulting pooled estimates of 25 imputed datasets were used for all analyses. Primary analysis of trial data was intention-to-treat (ITT)"
Missing outcome data (attrition bias)	Some concerns	Comment: Study Dropout rate is 12.8% Quote: "Frequency of missing values was low (ie, 5/133 cases or less) for all variables but high for education (24/133 cases) and summed up to 27.8% for the set of baseline characteristics. Comment: ITT analysis appropriate.
Measurement of the outcome (detection bias)	Low risk	Quote: "In order to test short- as well as medium-term treatment effects, 3 face-to-face interviews were scheduled with the study participants: baseline (T0: pre), immediately after the intervention (T1: post, 4 weeks after baseline), and 4 months after baseline (T2: follow-up)." Quote: "The study coordinator (SR), responsible for individual group allocation, remained blind to the randomization list strata identity. Moreover, the data analyst (AP), who conducted the primary analysis concerning the hypothesized group differences (IG vs CG) in primary and secondary outcome measures (see above), was blind to group assignment"
Selection of the reported results (reporting bias)	Low risk	Quote: "The trial was registered with the German Clinical Trials Register [DRKS00013782]" Comment: no multiple outcome measures for one domain. Results for all measured time-points are available

Researcher allegiance	Some concerns	Sanadak app was designed by the authors of this study
Overall bias	Some concerns	Due to missing outcome data

Sonne (2016)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "Randomization by envelopes was performed, stratified by gender and level of severity of PTSD symptoms on the basis of Harvard Trauma Questionnaire (HTQ) score" Quote:" A computer generated list was made by the Department of Biostatistics at the University of Copenhagen which was not otherwise involved in the trial. Consecutively numbered envelopes were sealed and these envelopes were administered by a group of secretaries at the central administration at Mental Health Centre Ballerup who had no other contact with the clinical staff at CTP during the study. Once a patient was included in the study, the doctor responsible for the inclusion phoned these secretaries and was informed of the group allocation."
Deviations from intended intervention (performance bias)	Low risk	Quote: "A total group of 156 patients (75.4 %) completed minimum 8 weeks of pharmacological treatment in accordance with the group to which they were randomized (68 in the venlafaxine group and 88 in the sertraline group). Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Low risk	Quote: "A total group of 156 patients (75.4 %) completed minimum 8 weeks of pharmacological treatment in accordance with the group to which they were randomized (68 in the venlafaxine group and 88 in the sertraline group)." Comment: intention-to-treat analyses used. Therefore, method to correct for bias due to missing outcome data
Measurement of the outcome (detection bias)	Some concerns	Quote: "The treatment outcome was measured by a combination of non-blinded self-report ratings and blinded observer ratings."
Selection of the reported results (reporting bias)	Low risk	Quote: "Trial Registration: ClinicalTrials.gov NCT01569685. Registration date: 28/2/12" Quote: „ Additionally, a protocol paper has been published previously" Comment: all outcome measures pre-specified
Overall bias	Some concerns	Due to measurement of the outcome

Stenmark (2016)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Some concerns	Quote: "Participants were randomized to the treatment conditions by drawing balls from a bag with an a priori 2/3 chance of receiving NET and 1/3 chance of receiving TAU." Comment: no information given on concealment of allocation
Deviations from intended intervention (performance bias)	Low risk	Quote: "Altogether, 54 patients completed both posttest and the follow up interviews;" Comment: n = 81 participants randomized. Comment: Non-adherence to intervention is Consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	Some concerns	Quote: "Following the recommendation of Hamer & Simpson (Hamer & Simpson, 2009) within an intention to treat analysis, data from all randomized patients were included in the final analyses." Comment: data analysis only for completers. But Quote: "There were no significant differences between the intent to treat sample and the treatment completers with respect to age, gender, level of education, time spent in exile, asylum status, HAM D scores, CAPS total scores, or their reported number of traumatic events."
Measurement of the outcome (detection bias)	Low risk	Quote: "The assessors had no access to information about what therapy the patients' had been assigned to, or to their previous assessments."

		Quote. "The aim was to make the assessors as blind as possible to the patients' treatments. In spite of these efforts, it appeared that in 11 (20%) of 54 post tests, the patients had revealed information about their treatment to the assessors. A statistical analysis showed no significant differences of these posttests from the other assessments."
Selection of the reported results (reporting bias)	High risk	Comment: Study preregistered in ClinicalTrial.gov with registration number NCT00218959 Quote: ". As a consequence, the effect sizes are necessarily restricted to the treatment completers." Comment: Data analysis and results restricted to study completers. Data from ITT analysis are not reported
Overall bias	High risk	Due to Selection of the reported results

Ter Heide (2011)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "…using simple randomization through flipping a coin: the outcome (EMDR for heads, stabilization for tails) was assigned to the patient lowest in the Alphabet." Quote: "An independent research associate performed randomization
Deviations from intended intervention (performance bias)	Low risk	Quote: "EMDR treatment adherence as rated by the EMDR Fidelity Scale was adequate" "Stabilization treatment adherence as rated by the stabilization fidelity scale designed for this study was also adequate" Quote: "In both conditions, five patients dropped out of the study (50%)." Comment: in both conditions, reasons for dropout given. Non-adherence to intervention is consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	High risk	Quote: "in this pilot study we chose to statistically analyze only completers' results. Intent-to-treat analysis with imputation of missing data might have provided different results." Comment: just data for study completers are reported, not intention-to-treat sample
Measurement of the outcome (detection bias)	Low risk	Quote: "The interview (SCID-I) was administered in Dutch by trained, blind assessors;" Quote: "HTQ, HSCL-25, and WHOQOL-BREF are self-report questionnaires " Comment: SCID-I is primary outcome and their assessors were intended to be blind
Selection of the reported results (reporting bias)	Some concerns	Comment: no information on pre-registration but detailed information on planned outcome measures Comment: no multiple outcome measures for one domain. Results for all measured time-points are available; No use of multiple methods / multiple estimated of the results
Overall bias	High risk	Due to Missing outcome data

Ter Heide (2016)

Bias	**Authors' judgement**	**Support for judgement**
Randomization process (selection bias)	Low risk	Quote: "Blocked, simple randomization was conducted…" Quote: "Participants were assigned to their experimental group through flipping a coin." Quote: "An independent research associate who was not otherwise involved in the inclusion process performed randomization."
Deviations from intended intervention (performance bias)	Low risk	Comment: Non-adherence to intervention is consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected
Missing outcome data (attrition bias)	low risk	Quote: "Bayesian estimation was used in all analyses with the default settings in Mplus with regard to prior specifications. Bayesian analysis enables full intent-to-treat analysis as missing data are automatically imputed."
Measurement of the outcome (detection bias)	Low risk	Quote: "Quote: "Interviews were administered by trained Master's students in psychology who were kept masked to treatment condition by having limited access to participant data and by asking participants not to reveal treatment content."
Selection of the reported results (reporting bias)	Low risk	Quote: "Trial registration: NARCIS (Dutch National Academic Research and Collaborations Information System) OND1324839; ISRCTN20310201." Comment: all outcome measures pre-specified
Overall bias	Low risk	No risk of bias was detected

Weine (2008)

Bias	Authors' judgement	Support for judgement
Randomization process (selection bias)	Some concerns	Quote: "Subjects were randomly assigned to one of two conditions: CAFES group (n = 110); control group (n = 87)." Comment: no further information given Quote: "No significant differences between groups are reported."
Deviations from intended intervention (performance bias)	Low risk	Quote: "The attrition rates for assessments of the control and intervention groups, respectively, were as follows: 14% and 17% (6 months); 10% and 6% (12 months); 1% and 4% (18 months)." Comment: Non-adherence to intervention is consistent with what could occur outside the trial context. Therefore, no deviations from the intended intervention can be detected. No participants were analyzed in the "wrong" intervention group
Missing outcome data (attrition bias)	High risk	Comment: no information on handling missing outcome data. No information given on reasons of withdrawal
Measurement of the outcome (detection bias)	Some concerns	Comment: self-report ratings. There participants count as assessors, which are not blinded. Assessment of mental health visits. No information on blinding of interviewers
Selection of the reported results (reporting bias))	High risk	Comment: Most outcomes are reported as random effect models. No information on raw data is given (exception: mental health visits) E.g.: Quote: 2 To assess for the possible contributions of key symptom variables, three quadratic random effects models were considered"
Overall bias	High risk	Due to missing outcome data and Selection of the reported results

Figure A6.3

Risk of Bias for all studies and domains

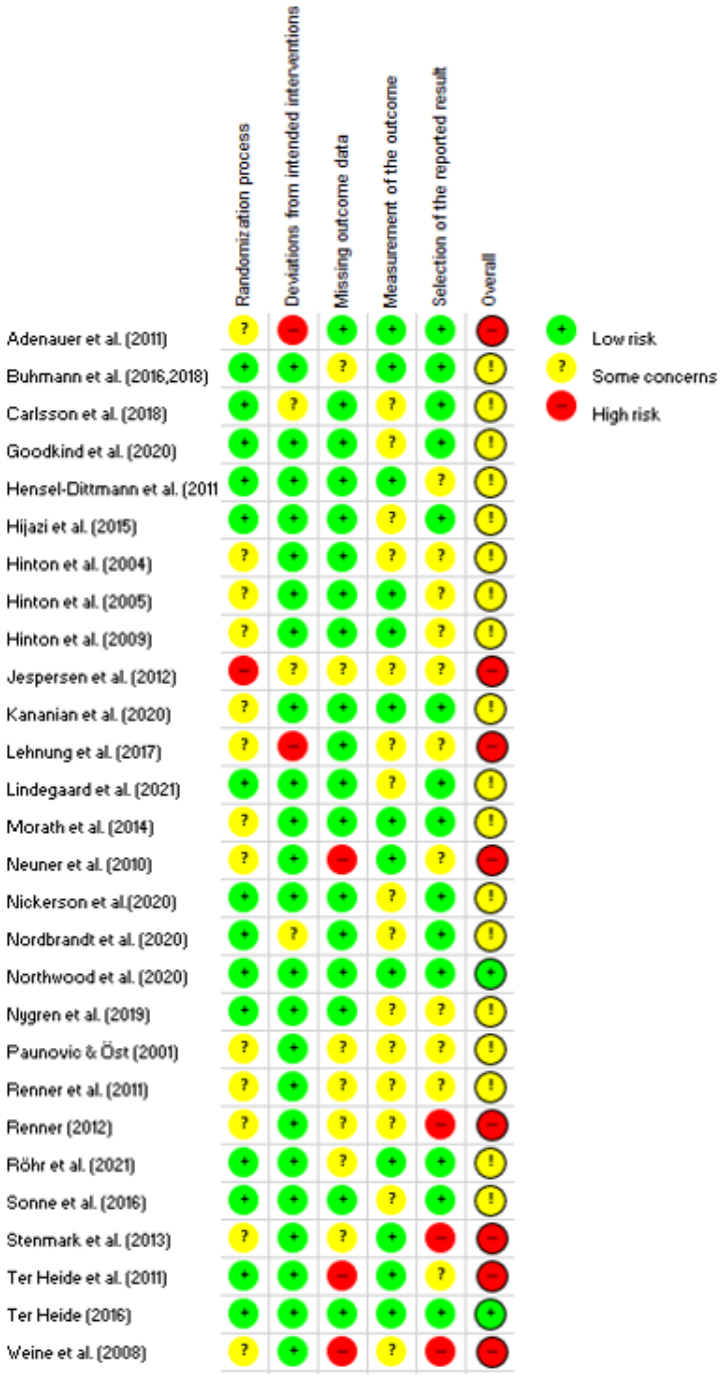


Figure A6.4

Percentage on risk of bias domains

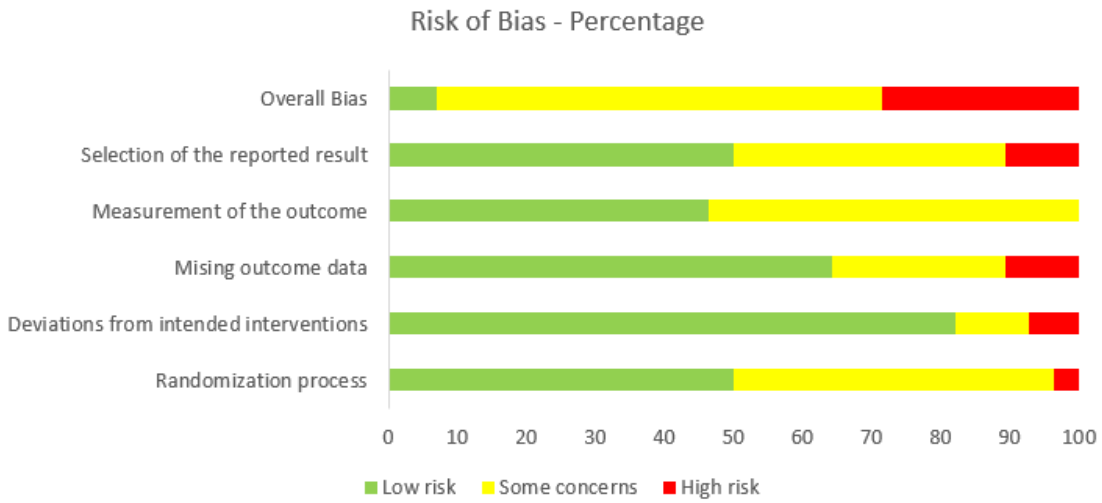


Table A6.1

Risk of Bias Assessment

	Randomization process (%)	Deviation from intended intervention (%)	Missing outcome data (%)	Measurement of the outcome (%)	Selection of the reported results (%)	Overall (%)
Number of Studies (n=28)						
Low risk	50.0	82.1	64.3	46.4	50.0	7.1
Some concerns	46.4	10.7	25.0	56.6	53.6	64.3
High risk	3.6	7.1	10.7	0.0	10.7	28.6

Note. Assessment of the risk of bias for the individual domains and overall. Assessment categories were: low, some concerns, high. Numbers are percentage.

Table A6.2

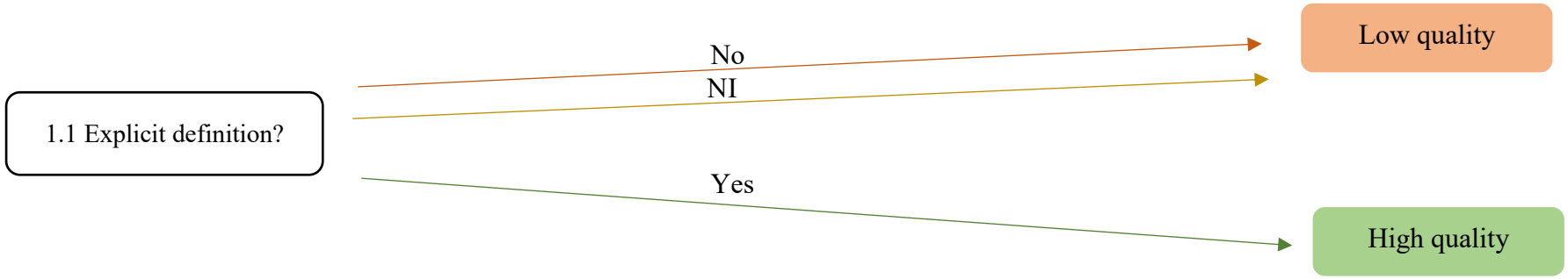
Overview of Risk of Bias for included studies on all domains

Author, year	Randomization process	Deviation from intended intervention	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall Bias
Adenauer et al. (2011)	Some	High	Low	Low	Low	High
Buhmann et al. (2016, 2018)	Low	Low	Some	Low	Low	Some
Carlsson et al. (2018)	Low	Some	Low	Some	Low	Some
Goodkind et al. (2020)	Low	Low	Low	Some	Low	Some
Hensel-Dittmann et al. (2011)	Low	Low	Low	Low	Some	Some
Hijazi et al. (2014)	Low	Low	Low	Some	Low	Some
Hinton et al. (2004)	Some	Low	Low	Some	Some	Some
Hinton et al. (2005)	Some	Low	Low	Low	Some	Some
Hinton et al. (2009)	Some	Low	Low	Low	Some	Some
Jespersen et al. (2012)	High	Some	Some	Some	Some	High
Kananian et al. (2020)	Some	Low	Low	Low	Low	Some
Lehnung et al. (2017)	Some	High	Low	Some	Some	High
Lindegaard et al. (2021)	Low	Low	Low	Some	Low	Some
Morath et al. (2014)	Some	Low	Low	Low	Low	Some
Neuner et al. (2010)	Some	Low	High	Low	Some	High
Nickerson et al. (2019)	Low	Low	Low	Some	Low	Some
Nordbrandt et al. (2020)	Low	Some	Low	Some	Low	Some
Northwood et al. (2020)	Low	Low	Low	Low	Low	Low
Nygren et al. (2019)	Low	Low	Low	Some	Some	Some
Paunovic & Öst (2001)	Some	Low	Some	Some	Some	Some
Renner (2012)	Some	Low	Some	Some	High	High
Renner et al. (2011)	Some	Low	Some	Some	Some	Some
Röhr et al. (2021)	Low	Low	Some	Low	Low	Some
Sonne et al. (2011)	Low	Low	Low	Some	Low	Some
Stenmark et al. (2013)	Some	Low	Some	Low	High	High
Ter Heide (2016)	Low	Low	Low	Low	Low	Low
Ter Heide et al. (2011)	Low	Low	High	Low	Some	High
Weine et al. (2008)	Some	Low	High	Some	High	High

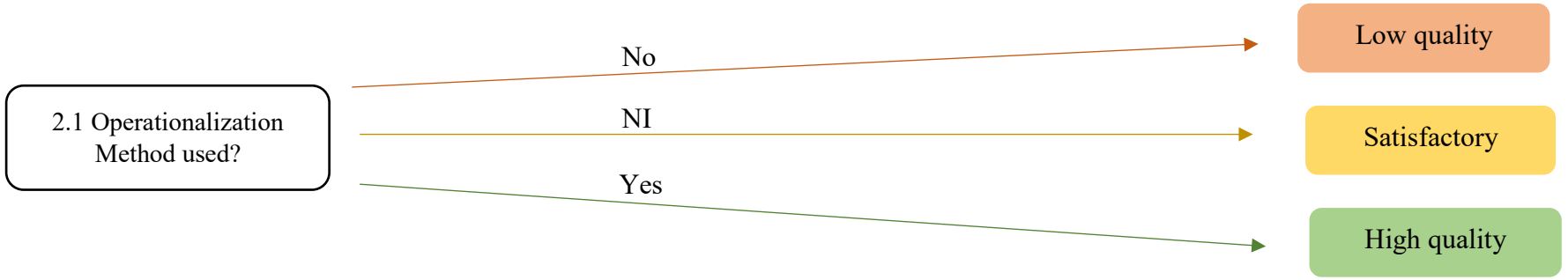
Note. Low = Low risk of bias; Some = Some concerns; High = high risk of bias

A7. Quality Rating Dropout – Assessing, Reporting, Analyzing

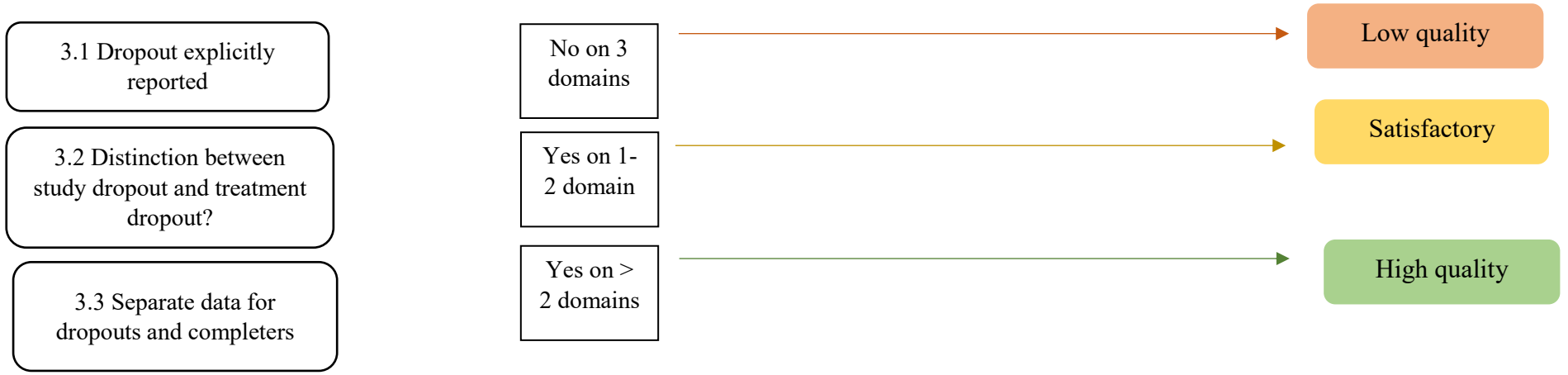
(1) Definition of Dropout			
Signaling Question	Elaboration	Response	Comment
Was there an explicit definition of dropout reported in the paper?	Answer "Yes", if an explicit definition of dropout is reported in the paper. Answer "No" if it is clear that the dropout data are not based on an explicit definition of dropout. Answer "NI" if no information on an underlying definition of dropout can be determined.	Y/ N / NI	



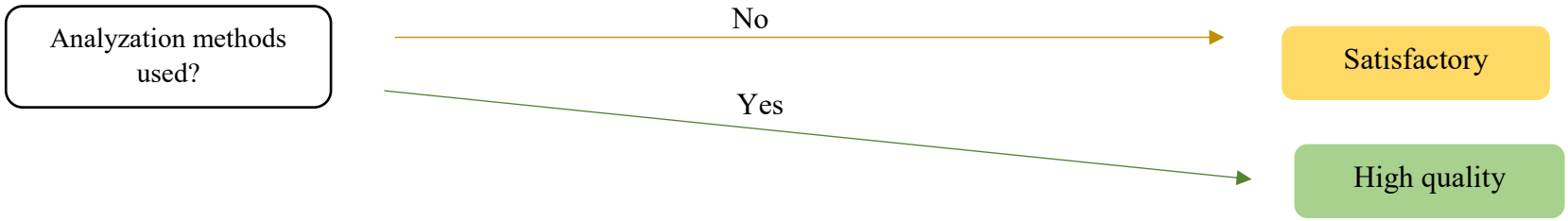
(2) Operationalization of dropout			
Signaling Question	Elaboration	Response	Comment
Was a clear method used to operationalization dropout?	Answer "Yes" if dropout was operationalized using a clear operationalization strategy (e.g. attending less than a given number of sessions, stopped attending treatment, therapist judgment). Answer "NI" if it cannot be ruled out that dropout was captured using a clear operationalization method. We rate NI as satisfactory when studies do mention the way dropout (completion) was assessed, but not report this as clear operationalization method	Y / N / NI	



(3) Reporting Dropout			
Signaling Question	Elaboration	Response	Comment
3.1 Is the number/ rate of dropout explicitly reported in the study?	Answer "Yes" if the number or rate of dropout is explicitly reported in the text of the manuscript. Answer "No" if dropout is only reported in the flow chart.	Y / N	
3.2 Does the article provide separate values for dropouts from the study and treatment dropouts?	Answer "Yes" if a distinction is made between a discontinuation from the study and from treatment. Note: also score "yes" if this distinction is made solely in the flowchart.	Y / N	
3.3 Are sample characteristics reported separately for dropouts and completers?	Answer "Yes" if sample characteristics are reported separately for the dropout group and for the completers	Y / N	



(4) Analyzing dropout			
Signaling Question	Elaboration	Response	Comment
Were statistical methods used to analyze dropout?	Were statistical methods used to analyze dropout. These include a distinction in the treatment effect between the dropouts and the completers; moderator analyses on the dropout rate, etc.		



Overall judgement	
Low quality	The study is judged to be on low quality in at least one domain for this result. Or the study has been judged “satisfactory” on all 4 domains.
Satisfactory	The study is judged “satisfactory” on 1-3 domains. And not at “low quality” for any domain
High quality	The study is judged on high quality 3-4 domains, and not at “low quality” for any domain

Table A7.1

Quality rating of Dropout for all included studies

Study	Definition of Dropout	Operationalization of dropout	Reporting Dropout	Analyzing Dropout	Overall Bias
Adenauer et al. (2011)	high	high	satisfactory	satisfactory	satisfactory
Buhmann et al. (2016, 2018)	Low	satisfactory	satisfactory	satisfactory	low
Carlsson et al. (2018)	high	high	satisfactory	satisfactory	satisfactory
Goodkind et al. (2020)	Low	satisfactory	satisfactory	satisfactory	low
Hensel-Dittmann et al. (2011)	Low	satisfactory	satisfactory	satisfactory	low
Hijazi et al. (2014)	Low	satisfactory	satisfactory	satisfactory	Low
Hinton et al. (2004)	low	Low	Low	satisfactory	low
Hinton et al. (2005)	low	Low	satisfactory	satisfactory	low
Hinton et al. (2009)	low	Low	satisfactory	satisfactory	low
Jespersen et al. (2012)	low	low	satisfactory	satisfactory	low
Kananian et al. (2020)	low	satisfactory	satisfactory	satisfactory	low
Lehnung et al. (2017)	low	low	satisfactory	satisfactory	low
Lindegaard et al. (2021)	high	high	satisfactory	high	high
Morath et al. (2014)	low	Low	satisfactory	satisfactory	low
Neuner et al. (2010)	high	high	satisfactory	satisfactory	satisfactory
Nickerson et al. (2019)	Low	satisfactory	satisfactory	satisfactory	low
Nordbrandt et al. (2020)	Low	satisfactory	satisfactory	satisfactory	low
Northwood et al. (2020)	Low	satisfactory	satisfactory	satisfactory	low
Nygren et al. (2019)	high	high	satisfactory	high	high
Paunovic & Öst (2001)	High	High	satisfactory	High	High
Renner (2012)	low	Low	low	satisfactory	low
Renner et al. (2011)	Low	Low	low	satisfactory	low
Röhr et al. (2021)	Low	satisfactory	satisfactory	High	low
Sonne et al. (2011)	high	high	satisfactory	satisfactory	satisfactory
Stenmark et al. (2013)	High	High	satisfactory	satisfactory	satisfactory
Ter Heide (2016)	Low	satisfactory	satisfactory	High	Low
Ter Heide et al. (2011)	Low	satisfactory	satisfactory	High	Low
Weine et al. (2008)	Low	Low	Satisfactory	Satisfactory	Low

Low = Low quality; Satisfactory = Satisfactory quality, High = High quality

Table A7.2

Overview of Quality Rating for Dropout

	Definition	Operationalization	Reporting	Analysis	Overall
Low quality	71.4% (20)	32.1 % (9)	10.7 % (3)	-	71.4% (20)
Satisfactory	-	39.3 % (11)	89.3% (25)	78.6% (22)	17.9 % (5)
High quality	28.6% (8)	28.6% (8)	-	21.4% (6)	10.7% (3)

A8. Dataset

[dataset] Semmlinger, V., Takano, K., Schumm, H., & Ehring, T. (2021). Data on Dropout from psychological and psychosocial interventions for refugees and asylum seekers: a systematic review and meta-analysis. SPSS data and R code.

URL: https://osf.io/rmdvq/?view_only=cf721c2b9fb64568b54c1af23f10863c

Appendix B. Publication III

Table B3.1 Correlations between variables studied

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Dropout	1																									
Gender	.06	1																								
Age	-.19	.23	1																							
Martial 1	.07	-.27	-.43	1																						
Martial 2	-.06	.23	.33	-.78	1																					
Martial 3	-.01	.09	.19	-.43	-.24	1																				
Living 1	.03	-.07	.05	.17	-.24	.08	1																			
Living 2	-.03	.18	.31	-.36	.46	-.11	-.58	1																		
Living 3	-.08	-.12	-.43	.3	-.25	-.10	-.20	-.42	1																	
Living 4	.09	-.06	-.09	.04	-.16	.18	-.18	-.38	-.13	1																
Education 1	-.09	-.03	.11	.00	.04	-.05	.18	-.07	-.14	.02	1															
Education 2	.13	-.06	-.16	.06	.02	-.11	-.12	-.07	.15	.11	-.23	1														
Education 3	.00	.05	-.04	.04	-.11	.10	-.08	.12	.01	-.11	-.51	-.51	1													
Education 4	-.04	.03	.13	-.14	.12	.04	.04	-.02	-.04	.01	-.16	-.15	-.35	1												
Treatment	-.06	-.14	.09	-.12	.09	.06	.02	.11	-.11	-.08	-.11	.00	.02	.11	1											
Comorbid PD	.06	.08	.02	-.01	-.05	.08	.10	-.03	.04	-.12	-.01	.04	.03	-.08	-.03	1										
Number CD	-.03	-.01	.05	-.08	.09	.00	-.09	.10	-.10	.06	.08	.02	-.14	.11	.21	-.45	1									
Gender match	.00	.50	.14	-.12	.12	.01	-.08	.18	-.09	-.08	-.03	-.03	.05	.00	-.09	.18	-.05	1								
Approval	.00	-.05	-.02	.04	-.01	-.05	-.04	.03	.02	-.02	.06	-.04	-.03	.02	-.09	-.16	.00	-.08	1							
PCL	.02	-.01	.02	-.07	.06	.02	.03	.08	-.09	-.08	-.08	.00	.02	.08	.16	-.05	.14	-.04	-.08	1						
CTQ	-.10	-.11	.07	-.09	.11	-.02	.02	.07	-.10	-.04	.02	-.14	.05	.07	.32	-.17	.19	-.05	.07	.23	1					
IIP	-.04	-.08	.01	-.14	.15	.00	.02	.11	-.06	-.14	.00	-.08	.04	.05	.21	.00	.13	-.06	-.02	.44	.42	1				
DES	.04	.06	-.12	-.05	.03	.03	.02	.02	.00	-.05	-.08	.01	.01	.08	.20	.00	.16	.03	-.05	.55	.31	.49	1			
PTCI	.04	-.12	-.09	-.01	.03	-.03	-.03	.07	.06	-.14	-.13	.04	.11	-.07	.21	-.07	.16	-.15	-.07	.60	.27	.58	.52	1		
IPSI	.13	-.03	-.17	-.02	.10	-.12	-.06	.08	.00	-.04	-.18	.08	.07	.01	.17	-.12	.13	-.05	-.01	.59	.18	.48	.56	.71	1	
DERS	-.01	-.08	-.09	-.09	.08	.02	-.03	.03	.00	-.02	-.12	.00	.02	.12	.14	-.07	.16	-.04	-.11	.57	.27	.66	.58	.69	.68	1

Note. Martial 1-4 = Marital status, category of the categorical variable 1 to 4; Living 1-4 = living situation, category of the categorical variable 1 to 4; Education 1-4 = highest education level, category of the categorical variable 1 to 4; treatment = previous psychological treatment (inpatient and/or outpatient); comorbid PD = comorbid personality disorder; number of CD = number of comorbid disorders; approval = approval therapist; PCL = PSTD-checklist for DSM-5 (PCL-5); CTQ = Childhood Trauma Questionnaire (CTQ-28); IIP = Inventory of Interpersonal Problems (IIP-32); DES = Dissociative Experience Scale; PTCI = Posttraumatic Cognitions Inventory; IPSI = Interpretation of Symptoms Inventory; DERS = Difficulties in Emotion Regulation Scale

Appendix C. Publication IV

C1. PRSIMA Checklists

Table C1.1 PRSIMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a meta-analysis	155
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	See Abstract Checklist
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	159-161
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	161, Abstract
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	161-163
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	161-163, C2.
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	161-163, C2.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	161-162
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	161-163; C3.
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	161-163; C3.; C7
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	161-163; C3; C7.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	163, C9.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	162-165
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	163-165
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	163-165
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	163-165
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	164-165
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	164-165

Section and Topic	Item #	Checklist item	Location where item is reported
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	/
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	163, C10.
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	163-165
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Flow Diagram, 166
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	C6.
Study characteristics	17	Cite each included study and present its characteristics.	165, C5., C7.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	173, C10.
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	165-173, Table 4.1, Table 4.2, Fig. 4.2, C4., C10.
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	165-173, Table 4.1, Table 4.2, C10.
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	165-173, Table 4.1, Table 4.2, Fig. 4.2, C4., C10.
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	170-173, Table 4.1, Table 4.2
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	/
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	173, C10.
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	165-173, Table 4.1, Table 4.2, Fig. 4.2, C4., C10.
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	174-177
	23b	Discuss any limitations of the evidence included in the review.	177-178
	23c	Discuss any limitations of the review processes used.	177-178
	23d	Discuss implications of the results for practice, policy, and future research.	178-179
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	155, 157, 161
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	161

Section and Topic	Item #	Checklist item	Location where item is reported
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	n.a.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	155, 180
Competing interests	26	Declare any competing interests of review authors.	155, 180
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	155, 180

Note. From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71 For more information, visit: http://www.prisma-statement.org/

Table C1.2 PRSIMA 2020 for Abstracts Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a meta-analysis.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e., which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	No
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	No
Registration	12	Provide the register name and registration number.	Yes

Note. From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71 For more information, visit: http://www.prisma-statement.org/

C2. Search Strategy

The literature search consisted of two independent search strategies covering the full scope of the published studies.

First Search Strategy: PTSD Trials Standardized Data Repository (PTSD Repository)

The PTSD Repository is a large database currently comprising 437 RCTs studying treatment for PTSD published between 1988 and March 03, 2023. We searched the *Study Interventions* data set for relevant studies, filtering the *Study Class* column for *Psychotherapy*. All studies were retrieved using the *Citation* column, and saved for further selection and screening. The PTSD Repository was only used to identify relevant studies. We did not use the data extracted from the relevant studies and provided in the PTSD Repository, but extracted the relevant information from the selected studies on our own.

Second Search Strategy: Database Search

The database search was conducted to retrieve all studies not included in the PTSD Repository. At the beginning of our work, the PTSD Repository contained all studies published up to July, 30, 2021 (update of the PTSD Repository published September, 19, 2022). At the time of finalization of our work, there was a second update published on September, 2023 containing all studies published up to March 03, 2023. We used an adapted version of the search string used in the PTSD-Repository. We searched the following electronic databases: Ovid Embase, Ovid Medline, PsycINFO (via Ebscohost), PTSDpubs. The following adaptions to the search sting from PTSD Repository had to be made: (1) Embase retrieved via Ovid, translation of search string for the provider; (2) PsycINFO retrieved via Ebscohost, translation of search string for the provider, (3) Cochrane CENTRAL, CINAHL, and SCOPUS were not included. The initial database search was conducted on April 12,2023 and included all studies published after June 01, 2021 (overlap with the PTSD Repository database). To updates were realized on July 20, 2023 and October 10,2023.

C3. Data Extraction – Variables

Non-Response

The non-response rate for each condition was calculated from (a) the number of non-responders at post-assessment for each condition (as a numerator) and (b) the number of participants who were randomized to that respective condition (as a denominator).
The extraction of the number of non-responders followed specific conditions:

(1) data were extracted at the respective post-assessment time point (≤ 6 weeks after treatment);
(2) the number of non-responders was directly extracted from the respective study (when reported), otherwise the number of non-responders was calculated by subtracting the reported number of responders in a condition from the total number of participants in that condition;
(3) non-response information based on per-protocol (PP) data was preferred, otherwise information was extracted from the intention-to-treat (ITT) sample
(4) a hierarchical structure was applied in studies, that reported different operationalization methods of non-response. Non-response data on the highest rank reported were extracted). If multiple data out of the same category were reported, we extracted the non-response information on the least stringent operationalization method given.
    a. retention of PTSD diagnosis
    b. failure to achieve a predefined symptom reduction as defined by the authors (e.g., 10-point/ 30% reduction on CAPS)
    c. failure to reach a significant change (e.g., RCI or clinically significant change)
    d. failure to achieve a predefined cut-off score (e.g., CAPS total score below 20)

Table C3.1 List of Variables and Operationalization

Domain	Variable	Operationalization
Study characteristics	Year of publication	Years
	Country of study	Country in which the study was conducted
	Sample size	*N*
	Type of control condition	Waiting list / Treatment as usual (TAU) / active control
	Type of analysis	Per protocol (PP) / intention to treat (ITT)
	Operationalization of non-response	Retention of PTSD-diagnosis / non-achievement of predefined symptom reduction / non-significant change / non-achievement of predefined cut-off score
Sample characteristics	Age	Mean age
	Gender	Percent female
	Marital Status	Percent married or in committed relationships
	Employment status	Percent employed full-time or part-time or student
	Education	Percent with college-level education
	Population	Civil / refugees/ Veterans & Military Personnel / mixed
	PTSD symptom severity	Z-standardized mean (CAPS, PSS-I, PCL)
	Comorbid depression	Percent with comorbid depression diagnosis
	Depression severity	Z-standardized mean (BDI, PHQ-9. HDRS, HRSD HAM-D, HADS, DASS, HSCL-25)
	Anxiety severity	Z-standardized mean (STAI, BAI, HSCL-25, DASS, HADS, SCL, STAX-trait)
Treatment-related variables	Treatment orientation	PE / CPT / CBT / EMDR / CT / BEP / NET
	Treatment format	Individual / group / combined
	Predefined time limit of treatment[1]	≤12 sessions / >12 sessions
	Number of sessions	Mean
	Duration of treatment in weeks	Mean
	Planned duration of sessions in minutes	Mean
	Homework given	Yes / no
Therapist characteristics	Experience level	Trainee / experienced/ mixed/ no therapist

[1] For the time limit, 12 sessions were set as cut-off, as this reflects the average of the suggested number of sessions for the seven from the APA recommended guideline-recommended PTSD treatments.

C4. Results of Sub Meta-analysis

Non-Response Rate

The weighted average non-response in the sub meta-analysis was 37.37%, 95% CI [32.54%, 42.46%], range 0% to 85.71%. The heterogeneity between studies was *substantial to considerable*, $Q(92) = 562.53$, $p < .0001$, $I^2 = 84.93\%$, 95% CI [83.07, 86.49]. The pooled *OR* in the sub meta-analysis was $OR = 0.19$, 95% CI [0.15, 0.25], with a *substantial* heterogeneity $Q(61) = 165.89$, $p < .0001$, $I^2 = 68.52\%$, 95% CI [61.10, 74.00].
The non-response rate and OR of the sub-meta-analysis were comparable to the full meta-analysis.

Subgroup analyses

All results are comparable to the full meta-analysis, expect for the predictor treatment format that no longer was a significant predictor for non-response in the sub meta-analysis.

Table C4.1 Results from Subgroup Analyses on the Non-Response Rate (Sub Meta-Analysis)

Moderator (k_t)	NR rate (%)	95% CI	*Q*	*p*	Adj. α
Study characteristics					
Country of study (93)			7.00	.638	.044
USA (48)	39.86	[32.91–47.25]			
Australia (15)	38.53	[25.74–53.13]			
Netherlands (9)	34.27	[20.43–51.43]			
Germany (4)	44.69	[24.62–66.64]			
Canada (5)	32.58	[15.80–55.45]			
England (7)	21.25	[11.68–35.52]			
Norway (2)	46.98	[19.92–75.94]			
Poland (1)	34.55	[9.81–71.91]			
Puerto Rico (1)	60.00	[12.47–94.04]			
Turkey (1)	38.78	[11.00–76.44]			
Type of analysis (93)			5.91	.015**	.019
Per protocol (38)	30.26	[23.78, 37.64]			
Intention to treat (55)	42.26	[36.02, 48.75]			
Sample characteristics					
Population (93)			28.42	< .001**	.006
Civil (58)	29.12	[24.66, 34.03]			
Veterans & Military Personnel (29)	50.94	[42.99, 58.84]			
Refugee (5)	57.97	[41.34, 72.94]			
Mixed (1)	50.00	[21.13, 78.87]			
Treatment characteristics					
Type of intervention (93)			27.96	<.001**	.013
PE (31)	38.00	[31.39, 45.08]			
CBT (23)	37.91	[29.80, 46.76]			
CPT (14)	47.26	[38.34, 56.37]			
EMDR (11)	29.60	[21.25, 39.59]			
CT (7)	21.15	[12.93, 32.62]			
NET (4)	69.75	[49.30, 84.54]			
BEP (2)	24.85	[10.26, 48.89]			
PE + CT (1)	14.63	[2.90, 49.59]			
Treatment format (92)			5.40	.067	.025
Individual (85)	36.90	[32.04, 42.03]			
Group (6)	46.37	[32.15, 61.21]			
Combined (1)	7.14	[0.98, 37.52]			
Time limit (10)			0.68	.410	.038
Low (≤ 12 sessions) (60)	36.35	[30.51, 42.63]			
High (> 12 sessions) (31)	40.51	[32.53, 49.01]			
Homework given (93)			0.06	.804	.05
Yes (60)	36.59	[29.13, 44.74]			
No (33)	37.81	[31.90, 44.10]			
Therapist characteristics					
Therapist experience level (78)			6.83	.078	.031
Trainee (40)	35.22	[28.52, 42.57]			
Experienced (15)	25.11	[16.61, 36.09]			
Mixed (16)	41.80	[30.53, 54.00]			
No therapist (7)	48.35	[31.81, 65.25]			

Note. k_t = number of treatment conditions; *Q* = Cochrane's *Q*; CI = confidence interval; adj. α = adjusted α level after Benjamini–Hochberg approach; NR = non-response; symptom reduction = Non-achievement of predefined symptom reduction; Non-significant change = Non-significant change per statistical formula; Non-achievement of cut-off = Non-achievement of predefined cut-off score; PTSD = posttraumatic stress disorder; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy.
*Benjamini–Hochberg corrected $p < .05$. **Benjamini–Hochberg corrected $p < .01$.

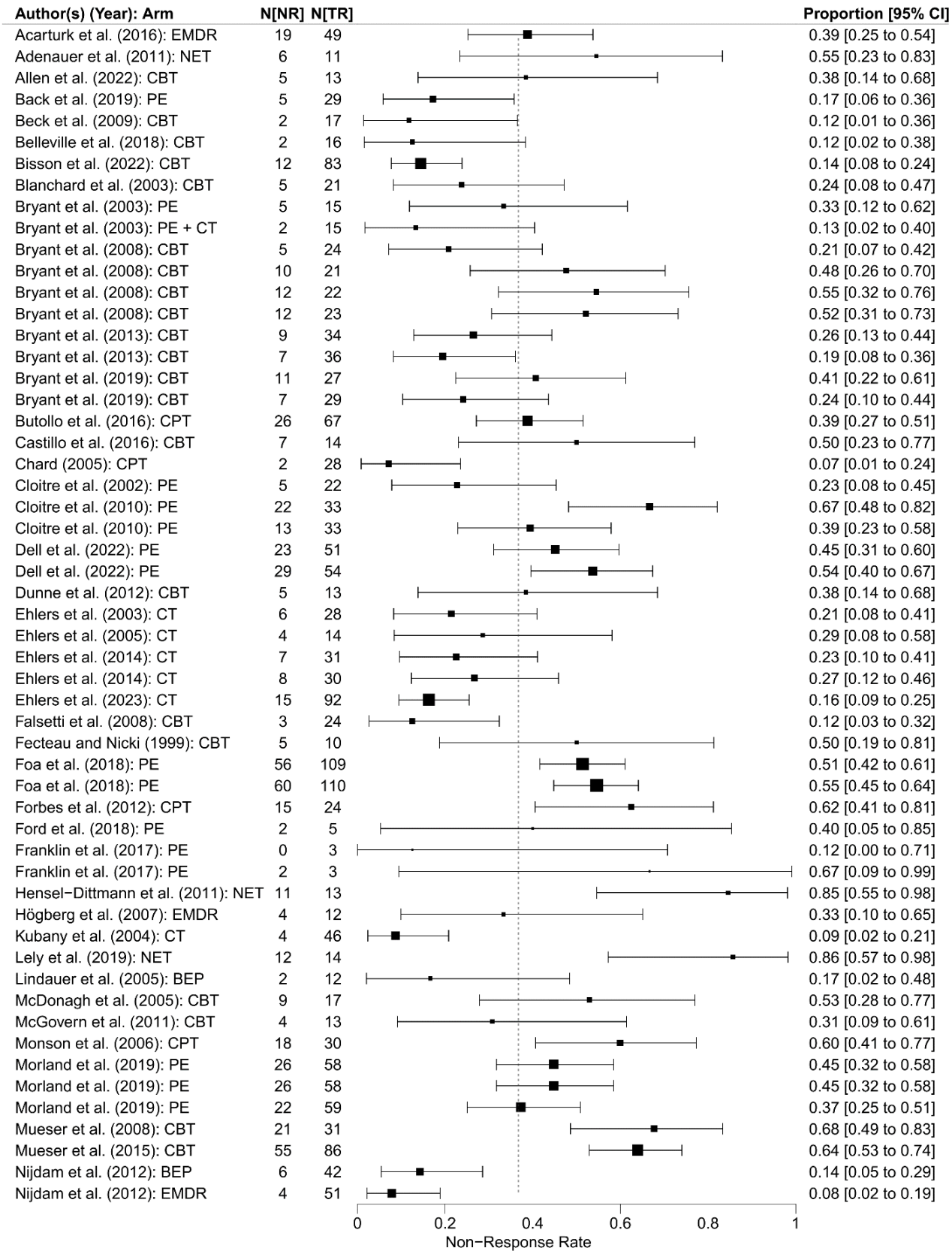
Meta-regression analyses

All results are comparable to the full meta-analysis.

Table C4.2 Results from Meta-Regression Analyses on the Non-Response Rate (Sub Meta-Analysis; Log-Transformed)

Moderator (k_t)	β	95% CI	*p*	Adj. α
Study characteristics				
Year of study publication (93)	0.04	[0.01, 0.07]	.018*	.023
Sample characteristics				
Age (63)	0.07	[0.03, 0.10]	<.001**	.004
Gender (66): % female	-0.95	[-1.68, -0.22]	.011*	.015
Marital (40): % committed relationship	1.27	[-0.23, 2.76]	.097	.027
Employment (32): % employed	-0.72	[-2.09, 0.66]	.306	.035
Education (32): % college-level	0.16	[-1.27, 1.59]	.829	.05
PTSD symptom severity score (70) [a]	0.27	[0.06, 0.48]	.013*	.019
Comorbid depression (35): % diagnosis	3.10	[1.07, 5.12]	.003**	.012
Depression score (75) [a]	0.42	[0.19, 0.65]	< .001**	.008
Anxiety score (43) [a]	0.25	[-0.05, 0.55]	.106	.031
Treatment characteristics				
Number of sessions (92)	0.01	[-0.04, 0.06]	.741	.046
Duration of session in minutes (79)	0.00	[-0.01, 0.01]	.732	.042
Duration of treatment in weeks (81)	-0.01	[-0.05, 0.03]	.581	.038

k_t = number of treatment conditions, CI = confidence interval, adj. α = adjusted α level after Benjamini–Hochberg approach, regression models were estimated separately for each predictor; [a] *z*-standardized
*Benjamini-Hochberg corrected $p < .05$. **Benjamini-Hochberg corrected $p < .01$.


Author(s) (Year): Arm
N[NR]
N[TR]
Proportion [95% CI]
Acarturk et al. (2016): EMDR 19 49 0.39 [0.25 to 0.54]
Adenauer et al. (2011): NET 6 11 0.55 [0.23 to 0.83]
Allen et al. (2022): CBT 5 13 0.38 [0.14 to 0.68]
Back et al. (2019): PE 5 29 0.17 [0.06 to 0.36]
Beck et al. (2009): CBT 2 17 0.12 [0.01 to 0.36]
Belleville et al. (2018): CBT 2 16 0.12 [0.02 to 0.38]
Bisson et al. (2022): CBT 12 83 0.14 [0.08 to 0.24]
Blanchard et al. (2003): CBT 5 21 0.24 [0.08 to 0.47]
Bryant et al. (2003): PE 5 15 0.33 [0.12 to 0.62]
Bryant et al. (2003): PE + CT 2 15 0.13 [0.02 to 0.40]
Bryant et al. (2008): CBT 5 24 0.21 [0.07 to 0.42]
Bryant et al. (2008): CBT 10 21 0.48 [0.26 to 0.70]
Bryant et al. (2008): CBT 12 22 0.55 [0.32 to 0.76]
Bryant et al. (2008): CBT 12 23 0.52 [0.31 to 0.73]
Bryant et al. (2013): CBT 9 34 0.26 [0.13 to 0.44]
Bryant et al. (2013): CBT 7 36 0.19 [0.08 to 0.36]
Bryant et al. (2019): CBT 11 27 0.41 [0.22 to 0.61]
Bryant et al. (2019): CBT 7 29 0.24 [0.10 to 0.44]
Butollo et al. (2016): CPT 26 67 0.39 [0.27 to 0.51]
Castillo et al. (2016): CBT 7 14 0.50 [0.23 to 0.77]
Chard (2005): CPT 2 28 0.07 [0.01 to 0.24]
Cloitre et al. (2002): PE 5 22 0.23 [0.08 to 0.45]
Cloitre et al. (2010): PE 22 33 0.67 [0.48 to 0.82]
Cloitre et al. (2010): PE 13 33 0.39 [0.23 to 0.58]
Dell et al. (2022): PE 23 51 0.45 [0.31 to 0.60]
Dell et al. (2022): PE 29 54 0.54 [0.40 to 0.67]
Dunne et al. (2012): CBT 5 13 0.38 [0.14 to 0.68]
Ehlers et al. (2003): CT 6 28 0.21 [0.08 to 0.41]
Ehlers et al. (2005): CT 4 14 0.29 [0.08 to 0.58]
Ehlers et al. (2014): CT 7 31 0.23 [0.10 to 0.41]
Ehlers et al. (2014): CT 8 30 0.27 [0.12 to 0.46]
Ehlers et al. (2023): CT 15 92 0.16 [0.09 to 0.25]
Falsetti et al. (2008): CBT 3 24 0.12 [0.03 to 0.32]
Fecteau and Nicki (1999): CBT 5 10 0.50 [0.19 to 0.81]
Foa et al. (2018): PE 56 109 0.51 [0.42 to 0.61]
Foa et al. (2018): PE 60 110 0.55 [0.45 to 0.64]
Forbes et al. (2012): CPT 15 24 0.62 [0.41 to 0.81]
Ford et al. (2018): PE 2 5 0.40 [0.05 to 0.85]
Franklin et al. (2017): PE 0 3 0.12 [0.00 to 0.71]
Franklin et al. (2017): PE 2 3 0.67 [0.09 to 0.99]
Hensel−Dittmann et al. (2011): NET 11 13 0.85 [0.55 to 0.98]
Högberg et al. (2007): EMDR 4 12 0.33 [0.10 to 0.65]
Kubany et al. (2004): CT 4 46 0.09 [0.02 to 0.21]
Lely et al. (2019): NET 12 14 0.86 [0.57 to 0.98]
Lindauer et al. (2005): BEP 2 12 0.17 [0.02 to 0.48]
McDonagh et al. (2005): CBT 9 17 0.53 [0.28 to 0.77]
McGovern et al. (2011): CBT 4 13 0.31 [0.09 to 0.61]
Monson et al. (2006): CPT 18 30 0.60 [0.41 to 0.77]
Morland et al. (2019): PE 26 58 0.45 [0.32 to 0.58]
Morland et al. (2019): PE 26 58 0.45 [0.32 to 0.58]
Morland et al. (2019): PE 22 59 0.37 [0.25 to 0.51]
Mueser et al. (2008): CBT 21 31 0.68 [0.49 to 0.83]
Mueser et al. (2015): CBT 55 86 0.64 [0.53 to 0.74]
Nijdam et al. (2012): BEP 6 42 0.14 [0.05 to 0.29]
Nijdam et al. (2012): EMDR 4 51 0.08 [0.02 to 0.19]
0
0.2
0.4
0.6
0.8
1
Non−Response Rate

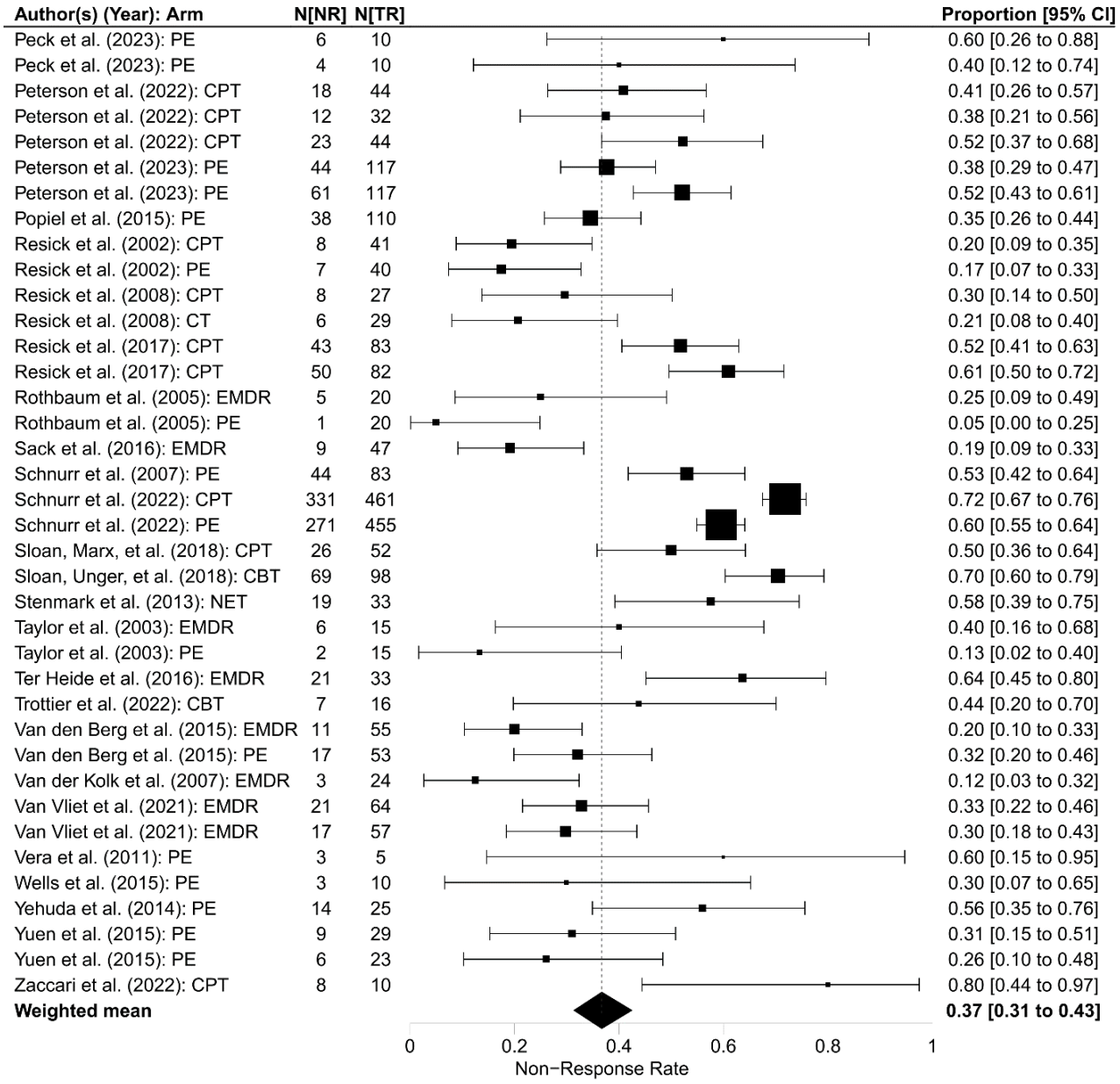


Figure C4.1 Forest Plot of Non-Response Rate Sub Meta-analysis.

N[NR] = number of non-responders; N[TR] = number in treatment group; CI = confidence interval; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy. Square size indicates study weight. The zero frequency has been trimmed by adding a small constant for computation purposes.

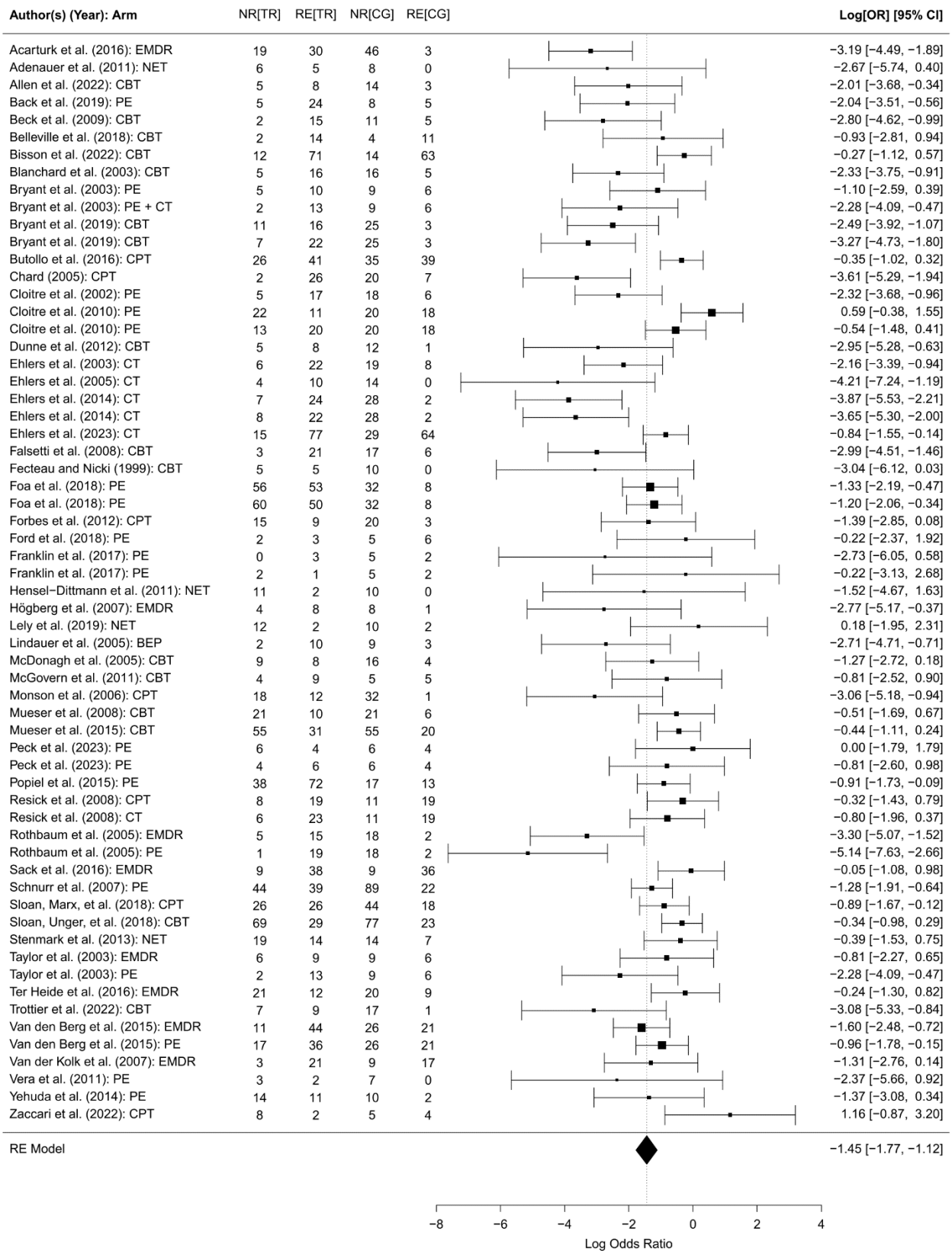


Figure C4.2 Forest Plot of log OR Sub Meta-analysis

Note. NR[TR] = number of non-responders treatment group; RE[TR] = number of responders treatment group; NR[CG] = number of non-responders control group; RE[CG] = number of responders control group; CI = confidence interval; Log *OR* = log transformed Odds Ratio; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy.

C5. References included in the meta-analysis

Acarturk, C., Konuk, E., Cetinkaya, M., Senay, I., Sijbrandij, M., Gulen, B., & Cuijpers, P. (2016). The efficacy of eye movement desensitization and reprocessing for post-traumatic stress disorder and depression among Syrian refugees: results of a randomized controlled trial. *Psychological Medicine*, *46*(12), 2583–2593. https://doi.org/10.1017/S0033291716001070

Adenauer, H., Catani, C., Gola, H., Keil, J., Ruf, M., Schauer, M., & Neuner, F. (2011). Narrative exposure therapy for PTSD increases top-down processing of aversive stimuli - evidence from a randomized controlled treatment trial. *BMC Neuroscience*, *12*(1), 1–13. https://doi.org/10.1186/1471-2202-12-127/FIGURES/7

Allen, A. R., Smith, J., Hobbs, M. J., Loughnan, S. A., Sharrock, M., Newby, J. M., Andrews, G., & Mahoney, A. E. J. (2022). Internet-delivered cognitive behaviour therapy for post-traumatic stress disorder: a randomised controlled trial and outcomes in routine care. *Behavioural and cognitive psychotherapy*, *50*(6), 649-655. https://doi.org/https://dx.doi.org/10.1017/S1352465822000285

Back, S. E., Killeen, T., Badour, C. L., Flanagan, J. C., Allan, N. P., Ana, E. S., Lozano, B., Korte, K. J., Foa, E. B., & Brady, K. T. (2019). Concurrent treatment of substance use disorders and PTSD using prolonged exposure: A randomized clinical trial in military veterans. *Addictive Behaviors*, *90*, 369–377. https://doi.org/10.1016/J.ADDBEH.2018.11.032

Beck, J. G., Coffey, S. F., Foy, D. W., Keane, T. M., & Blanchard, E. B. (2009). Group cognitive behavior therapy for chronic posttraumatic stress disorder: an initial randomized pilot study. *Behavior Therapy*, *40*(1), 82–92. https://doi.org/10.1016/J.BETH.2008.01.003

Belleville, G., Dubé-Frenette, M., & Rousseau, A. (2018). Efficacy of Imagery Rehearsal Therapy and Cognitive Behavioral Therapy in Sexual Assault Victims With Posttraumatic Stress Disorder: A Randomized Controlled Trial. *Journal of Traumatic Stress*, *31*(4), 591–601. https://doi.org/10.1002/JTS.22306

Bisson, J. I., Ariti, C., Cullen, K., Kitchiner, N., Lewis, C., Roberts, N. P., Simon, N., Smallman, K., Addison, K., Bell, V., Brookes-Howell, L., Cosgrove, S., Ehlers, A., Fitzsimmons, D., Foscarini-Craggs, P., Harris, S. R. S., Kelson, M., Lovell, K., McKenna, M., . . . Williams-Thomas, R. (2022). Guided, internet based, cognitive behavioural therapy for post-traumatic stress disorder: pragmatic, multicentre, randomised controlled non-inferiority trial (RAPID). *BMJ (Clinical research ed.)*, *377*, e069405-e069405. https://doi.org/https://dx.doi.org/10.1136/bmj-2021-069405

Blanchard, E. B., Hickling, E. J., Devineni, T., Veazey, C. H., Galovski, T. E., Mundy, E., Malta, L. S., & Buckley, T. C. (2003). A controlled evaluation of cognitive behavioral therapy for h7 stress in motor vehicle accident survivors. *Behaviour Research and Therapy*, *41*(1), 79–96. https://doi.org/10.1016/S0005-7967(01)00131-0

Bohus, M., Dyer, A. S., Priebe, K., Krüger, A., Kleindienst, N., Schmahl, C., Niedtfeld, I., & Steil, R. (2013). Dialectical behaviour therapy for post-traumatic stress disorder after childhood sexual abuse in patients with and without borderline personality disorder: A randomised controlled trial. *Psychotherapy and Psychosomatics*, *82*(4), 221–233. https://doi.org/10.1159/000348451

Brady, F., Chisholm, A., Walsh, E., Ottisova, L., Bevilacqua, L., Mason, C., Von Werthern, M., Cannon, T., Curry, C., Komolafe, K., Robert, R. E., & Robjant, K. (2021). Narrative exposure therapy for survivors of human trafficking: Feasibility randomised controlled trial. *BJPsych Open*, *7*(6), e196-e196. https://doi.org/https://dx.doi.org/10.1192/bjo.2021.1029

Bryant, R. A., Ekasawin, S., Chakrabhand, S., Suwanmitri, S., Duangchun, O., & Chantaluckwong, T. (2011). A randomized controlled effectiveness trial of cognitive behavior therapy for post-traumatic stress disorder in terrorist-affected people in Thailand. *World Psychiatry*, *10*(3), 205. https://doi.org/10.1002/J.2051-5545.2011.TB00058.X

Bryant, R. A., Kenny, L., Rawson, N., Cahill, C., Joscelyne, A., Garber, B., Tockar, J., Dawson, K., & Nickerson, A. (2019). Efficacy of exposure-based cognitive behaviour therapy for post-traumatic stress disorder in emergency service personnel: a randomised clinical trial. *Psychological Medicine*, *49*(9), 1565–1573. https://doi.org/10.1017/S0033291718002234

Bryant, R. A., Mastrodomenico, J., Hopwood, S., Kenny, L., Cahill, C., Kandris, E., & Taylor, K. (2013). Augmenting cognitive behaviour therapy for post-traumatic stress disorder with emotion tolerance training: a randomized controlled trial. *Psychological Medicine*, *43*(10), 2153–2160. https://doi.org/10.1017/S0033291713000068

Bryant, R. A., Moulds, M. L., Guthrie, R. M., Dang, S. T., Mastrodomenico, J., Nixon, R. D. V., Felmingham, K. L., Hopwood, S., & Creamer, M. (2008). A randomized controlled trial of exposure therapy and cognitive restructuring for posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, *76*(4), 695. https://doi.org/10.1037/A0012616

Bryant, R. A., Moulds, M. L., Guthrie, R. M., Dang, S. T., & Nixon, R. D. V. (2003). Imaginal exposure alone and imaginal exposure with cognitive restructuring in treatment of posttraumatic stress disorder.

Journal of Consulting and Clinical Psychology, *71*(4), 706–712. https://doi.org/10.1037/0022-006X.71.4.706

Butollo, W., Karl, R., König, J., & Rosner, R. (2016). A Randomized Controlled Clinical Trial of Dialogical Exposure Therapy versus Cognitive Processing Therapy for Adult Outpatients Suffering from PTSD after Type I Trauma in Adulthood. *Psychotherapy and Psychosomatics*, *85*(1), 16–26. https://doi.org/10.1159/000440726

Castillo, D. T., Chee, C. L., Nason, E., Keller, J., C'De Baca, J., Qualls, C., Fallon, S. K., Haaland, K. Y., Miller, M. W., & Keane, T. M. (2016). Group-delivered cognitive/exposure therapy for PTSD in women veterans: A randomized controlled trial. *Psychological Trauma: Theory, Research, Practice, and Policy*, *8*(3), 404–412. https://doi.org/10.1037/TRA0000111

Chard, K. M. (2005). An evaluation of cognitive processing therapy for the treatment of posttraumatic stress disorder related to childhood sexual abuse. *Journal of Consulting and Clinical Psychology*, *73*(5), 965–971. https://doi.org/10.1037/0022-006X.73.5.965

Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, *70*(5), 1067–1074. https://doi.org/10.1037//0022-006X.70.5.1067

Cloitre, M., Stovall-McClough, K. C., Nooner, K., Zorbas, P., Cherry, S., Jackson, C. L., Gan, W., & Petkova, E. (2010). Treatment for PTSD related to childhood abuse: A randomized controlled trial. *American Journal of Psychiatry*, *167*(8), 915–924. https://doi.org/10.1176/appi.ajp.2010.09081247

Dell, L., Sbisa, A., Forbes, A., O'Donnell, M., Bryant, R., Hodson, S., Morton, D., Battersby, M., Tuerk, P., Wallace, D., & Forbes, D. (2022). Effect of massed v. standard prolonged exposure therapy on PTSD in military personnel and veterans: a non-inferiority randomised controlled trial. *Psychological Medicine*, 1-8. https://doi.org/https://doi.org/10.1017/S0033291722000927

Dunne, R. L., Kenardy, J., & Sterling, M. (2012). A randomized controlled trial of cognitive-behavioral therapy for the treatment of PTSD in the context of chronic whiplash. *Clinical Journal of Pain*, *28*(9), 755–765. https://doi.org/10.1097/AJP.0B013E318243E16B

Ehlers, A., Clark, D. M., Hackmann, A., McManus, F., Fennell, M., Herbert, C., & Mayou, R. (2003). A Randomized Controlled Trial of Cognitive Therapy, a Self-help Booklet, and Repeated Assessments as Early Interventions for Posttraumatic Stress Disorder. *Archives of General Psychiatry*, *60*(10), 1024–1032. https://doi.org/10.1001/ARCHPSYC.60.10.1024

Ehlers, A., Clark, D. M., Hackmann, A., McManus, F., & Fennell, M. (2005). Cognitive therapy for post-traumatic stress disorder: development and evaluation. *Behav Res Ther*, *43*(4), 413-431. https://doi.org/10.1016/j.brat.2004.03.006

Ehlers, A., Hackmann, A., Grey, N., Wild, J., Liness, S., Albert, I., Deale, A., Stott, R., & Clark, D. M. (2014). A randomized controlled trial of 7-day intensive and standard weekly cognitive therapy for PTSD and emotion-focused supportive therapy. *American Journal of Psychiatry*, *171*(3), 294–304. https://doi.org/10.1176/APPI.AJP.2013.13040552/ASSET/IMAGES/LARGE/294F2.JPEG

Ehlers, A., Wild, J., Warnock-Parkes, E., Grey, N., Murray, H., Kerr, A., Rozental, A., Thew, G., Janecka, M., Beierl, E., Tsiachristas, A., Perera-Salazar, R., Andersson, G., & Clark, D. (2023). Therapist-assisted online psychological therapies differing in trauma focus for post-traumatic stress disorder (STOP-PTSD): a UK-based, single-blind, randomised controlled trial. *Lancet Psychiatry*, *10*(8), 608-622. https://doi.org/https://doi.org/10.1016/S2215-0366(23)00181-5

Falsetti, S. A., Resnick, H. S., & Davis, J. L. (2008). Multiple channel exposure therapy for women with PTSD and comorbid panic attacks. *Cognitive Behaviour Therapy*, *37*(2), 117–130. https://doi.org/10.1080/16506070801969088

Fecteau, G., & Nicki, R. (1999). Cognitive Behavioural Treatment of Post Traumatic Stress Disorder after Motor Vehicle Accident. *Undefined*, *27*(3), 201–214. https://doi.org/10.1017/S135246589927302X

Feske, U. (2008). Treating low-income and minority women with posttraumatic stress disorder: a pilot study comparing prolonged exposure and treatment as usual conducted by community therapists. *Journal of Interpersonal Violence*, *23*(8), 1027–1040. https://doi.org/10.1177/0886260507313967

Foa, E. B., McLean, C. P., Zang, Y., Rosenfield, D., Yadin, E., Yarvis, J. S., Mintz, J., Young-McCaughan, S., Borah, E. V., Dondanville, K. A., Fina, B. A., Hall-Clark, B. N., Lichner, T., Litz, B. T., Roache, J., Wright, E. C., & Peterson, A. L. (2018). Effect of Prolonged Exposure Therapy Delivered Over 2 Weeks vs 8 Weeks vs Present-Centered Therapy on PTSD Symptom Severity in Military Personnel: A Randomized Clinical Trial. *JAMA*, *319*(4), 354–364. https://doi.org/10.1001/JAMA.2017.21242

Forbes, D., Lloyd, D., Nixon, R. D. V., Elliott, P., Varker, T., Perry, D., Bryant, R. A., & Creamer, M. (2012). A multisite randomized controlled effectiveness trial of cognitive processing therapy for military-related posttraumatic stress disorder. *Journal of Anxiety Disorders*, *26*(3), 442–452. https://doi.org/10.1016/J.JANXDIS.2012.01.006

Ford, J. D., Grasso, D. J., Greene, C. A., Slivinsky, M., & DeViva, J. C. (2018). Randomized clinical trial pilot study of prolonged exposure versus present centred affect regulation therapy for PTSD and anger

problems with male military combat veterans. *Clinical Psychology & Psychotherapy*, *25*(5), 641–649. https://doi.org/10.1002/CPP.2194

Franklin, C. L., Cuccurullo, L. A., Walton, J. L., Arseneau, J. R., & Petersen, N. J. (2017). Face to face but not in the same place: A pilot study of prolonged exposure therapy. *Journal of Trauma & Dissociation: The Official Journal of the International Society for the Study of Dissociation (ISSD)*, *18*(1), 116–130. https://doi.org/10.1080/15299732.2016.1205704

Hensel-Dittmann, D., Schauer, M., Ruf, M., Catani, C., Odenwald, M., Elbert, T., & Neuner, F. (2011). Treatment of traumatized victims of war and torture: a randomized controlled comparison of narrative exposure therapy and stress inoculation training. *Psychotherapy and Psychosomatics*, *80*(6), 345–352. https://doi.org/10.1159/000327253

Hinton, D. E., Hofmann, S. G., Rivera, E., Otto, M. W., & Pollack, M. H. (2011). Culturally adapted CBT (CA-CBT) for Latino women with treatment-resistant PTSD: a pilot study comparing CA-CBT to applied muscle relaxation. *Behaviour Research and Therapy*, *49*(4), 275–280. https://doi.org/10.1016/J.BRAT.2011.01.005

Högberg, G., Pagani, M., Sundin, Ö., Soares, J., Åberg-Wistedt, A., Tärnell, B., & Hällström, T. (2007). On treatment with eye movement desensitization and reprocessing of chronic post-traumatic stress disorder in public transportation workers--a randomized controlled trial. *Nordic Journal of Psychiatry*, *61*(1), 54–61. https://doi.org/10.1080/08039480601129408

Hollifield, M., Sinclair-Lian, N., Warner, T. D., & Hammerschlag, R. (2007). Acupuncture for posttraumatic stress disorder: a randomized controlled pilot trial. *The Journal of Nervous and Mental Disease*, *195*(6), 504–513. https://doi.org/10.1097/NMD.0B013E31803044F8

Karatzias, T., Power, K., Brown, K., McGoldrick, T., Begum, M., Young, J., Loughran, P., Chouliara, Z., & Adams, S. (2011). A controlled comparison of the effectiveness and efficiency of two psychological therapies for posttraumatic stress disorder: eye movement desensitization and reprocessing vs. emotional freedom techniques. *The Journal of Nervous and Mental Disease*, *199*(6), 372–378. https://doi.org/10.1097/NMD.0B013E31821CD262

Kubany, E. S., Hill, E. E., Owens, J. A., Iannce-Spencer, C., McCaig, M. A., Tremayne, K. J., & Williams, P. L. (2004). Cognitive trauma therapy for battered women with PTSD (CTT-BW). *Journal of Consulting and Clinical Psychology*, *72*(1), 3–18. https://doi.org/10.1037/0022-006X.72.1.3

Langkaas, T. F., Hoffart, A., Øktedalen, T., Ulvenes, P. G., Hembree, E. A., & Smucker, M. (2017). Exposure and non-fear emotions: A randomized controlled study of exposure-based and rescripting-based imagery in PTSD treatment. *Behaviour Research and Therapy*, *97*, 33–42. https://doi.org/10.1016/J.BRAT.2017.06.007

Lely, J. C. G., Knipscheer, J. W., Moerbeek, M., Ter Heide, F. J. J., Van Den Bout, J., & Kleber, R. J. (2019). Randomised controlled trial comparing narrative exposure therapy with present-centred therapy for older patients with post-traumatic stress disorder. *The British Journal of Psychiatry : The Journal of Mental Science*, *214*(6), 369–377. https://doi.org/10.1192/BJP.2019.59

Lindauer, R. J. L., Gersons, B. P. R., Van Meijel, E. P. M., Blom, K., Carlier, I. V. E., Vrijlandt, I., & Olff, M. (2005). Effects of brief eclectic psychotherapy in patients with posttraumatic stress disorder: randomized clinical trial. *Journal of Traumatic Stress*, *18*(3), 205–212. https://doi.org/10.1002/JTS.20029

Markowitz, J. C., Petkova, E., Neria, Y., Van Meter, P. E., Zhao, Y., Hembree, E., Lovell, K., Biyanova, T., & Marshall, R. D. (2015). Is Exposure Necessary? A Randomized Clinical Trial of Interpersonal Psychotherapy for PTSD. *The American Journal of Psychiatry*, *172*(5), 430–440. https://doi.org/10.1176/APPI.AJP.2014.14070908

Maxwell, K., Callahan, J. L., Holtz, P., Janis, B. M., Gerber, M. M., & Connor, D. R. (2016). Comparative study of group treatments for posttraumatic stress disorder. *Psychotherapy (Chicago, Ill.)*, *53*(4), 433–445. https://doi.org/10.1037/PST0000032

McDonagh, A., McHugo, G., Sengupta, A., Demment, C. C., Schnurr, P. P., Friedman, M., Ford, J., Mueser, K., Founder, D., & Descamps, M. (2005). Randomized trial of cognitive-behavioral therapy for chronic posttraumatic stress disorder in adult female survivors of childhood sexual abuse. *Journal of Consulting and Clinical Psychology*, *73*(3), 515–524. https://doi.org/10.1037/0022-006X.73.3.515

McGovern, M. P., Lambert-Harris, C., Alterman, A. I., Xie, H., & Meier, A. (2011). A Randomized Controlled Trial Comparing Integrated Cognitive Behavioral Therapy Versus Individual Addiction Counseling for Co-occurring Substance Use and Posttraumatic Stress Disorders. *Journal of Dual Diagnosis*, *7*(4), 207–227. https://doi.org/10.1080/15504263.2011.620425

McLay, R. N., Baird, A., Webb-Murphy, J., Deal, W., Tran, L., Anson, H., Klam, W., & Johnston, S. (2017). A Randomized, Head-to-Head Study of Virtual Reality Exposure Therapy for Posttraumatic Stress Disorder. *Cyberpsychology, Behavior and Social Networking*, *20*(4), 218–224. https://doi.org/10.1089/CYBER.2016.0554

Monson, C. M., Schnurr, P. P., Resick, P. A., Friedman, M. J., Young-Xu, Y., & Stevens, S. P. (2006). Cognitive processing therapy for veterans with military-related posttraumatic stress disorder. *Journal of Consulting and Clinical Psychology*, *74*(5), 898–907. https://doi.org/10.1037/0022-006X.74.5.898

Morland, L. A., Mackintosh, M. A., Glassman, L. H., Wells, S. Y., Thorp, S. R., Rauch, S. A. M., Cunningham, P. B., Tuerk, P. W., Grubbs, K. M., Golshan, S., Sohn, M. J., & Acierno, R. (2019). Home-based delivery of variable length prolonged exposure therapy: A comparison of clinical efficacy between service modalities. *Depression and Anxiety*, *37*(4), 346–355. https://doi.org/10.1002/DA.22979

Mueser, K. T., Gottlieb, J. D., Xie, H., Lu, W., Yanos, P. T., Rosenberg, S. D., Silverstein, S. M., Duva, S. M., Minsky, S., Wolfe, R. S., & McHugo, G. J. (2015). Evaluation of cognitive restructuring for post-traumatic stress disorder in people with severe mental illness. *The British Journal of Psychiatry : The Journal of Mental Science*, *206*(6), 501–508. https://doi.org/10.1192/BJP.BP.114.147926

Mueser, K. T., Rosenberg, S. D., Xie, H., Jankowski, M. K., Bolton, E. E., Lu, W., Hamblen, J. L., Rosenberg, H. J., McHugo, G. J., & Wolfe, R. (2008). A randomized controlled trial of cognitive-behavioral treatment for posttraumatic stress disorder in severe mental illness. *Journal of Consulting and Clinical Psychology*, *76*(2), 259–271. https://doi.org/10.1037/0022-006X.76.2.259

Nidich, S., Mills, P. J., Rainforth, M., Heppner, P., Schneider, R. H., Rosenthal, N. E., Salerno, J., Gaylord-King, C., & Rutledge, T. (2018). Non-trauma-focused meditation versus exposure therapy in veterans with post-traumatic stress disorder: a randomised controlled trial. *The Lancet. Psychiatry*, *5*(12), 975–986. https://doi.org/10.1016/S2215-0366(18)30384-5

Nijdam, M. J., Gersons, B. P. R., Reitsma, J. B., De Jongh, A., & Olff, M. (2012). Brief eclectic psychotherapy v. eye movement desensitisation and reprocessing therapy for post-traumatic stress disorder: randomised controlled trial. *The British Journal of Psychiatry : The Journal of Mental Science*, *200*(3), 224–231. https://doi.org/10.1192/BJP.BP.111.099234

Peck, K. R., Badger, G. J., Cole, R., Higgins, S. T., Moxley-Kelly, N., & Sigmon, S. C. (2023). Prolonged exposure therapy for PTSD in individuals with opioid use disorder: A randomized pilot study. *Addictive Behaviors*, *143*, 1-8. https://doi.org/10.1016/j.addbeh.2023.107688

Peterson, A. L., Blount, T. H., Foa, E. B., Brown, L. A., McLean, C. P., Mintz, J., Schobitz, R. P., DeBeer, B. R., Mignogna, J., Fina, B. A., Evans, W. R., Synett, S., Hall-Clark, B. N., Rentz, T. O., Schrader, C., Yarvis, J. S., Dondanville, K. A., Hansen, H., Jacoby, V. M., . . . Keane, T. M. (2023). Massed vs Intensive Outpatient Prolonged Exposure for Combat-Related Posttraumatic Stress Disorder: A Randomized Clinical Trial. *JAMA network open*, *6*(1), e2249422-e2249422. https://doi.org/https://dx.doi.org/10.1001/jamanetworkopen.2022.49422

Peterson, A. L., Mintz, J., Moring, J. C., Straud, C. L., Young-McCaughan, S., McGeary, C. A., McGeary, D. D., Litz, B. T., Velligan, D. I., Macdonald, A., Mata-Galan, E., Holliday, S. L., Dillon, K. H., Roache, J. D., Bira, L. M., Nabity, P. S., Medellin, E. M., Hale, W. J., & Resick, P. A. (2022). In-office, in-home, and telehealth cognitive processing therapy for posttraumatic stress disorder in veterans: a randomized clinical trial. *BMC Psychiatry*, *22*(1), 41-41. https://doi.org/https://dx.doi.org/10.1186/s12888-022-03699-4

Popiel, A., Zawadzki, B., Pragłowska, E., & Teichman, Y. (2015). Prolonged exposure, paroxetine and the combination in the treatment of PTSD following a motor vehicle accident. A randomized clinical trial - The "tRAKT" study. *Journal of Behavior Therapy and Experimental Psychiatry*, *48*, 17–26. https://doi.org/10.1016/J.JBTEP.2015.01.002

Rauch, S. A. M., King, A. P., Abelson, J., Tuerk, P. W., Smith, E., Rothbaum, B. O., Clifton, E., Defever, A., & Liberzon, I. (2015). Biological and symptom changes in posttraumatic stress disorder treatment: A randomized clinical trial. *Depression and Anxiety*, *32*(3), 204–212. https://doi.org/10.1002/DA.22331

Ready, D. J., Mascaro, N., Wattenberg, M. S., Sylvers, P., Worley, V., & Bradley-Davino, B. (2018). A Controlled Study of Group-Based Exposure Therapy with Vietnam-Era Veterans. *Https://Doi.Org/10.1080/15325024.2018.1485268*, *23*(6), 439–457. https://doi.org/10.1080/15325024.2018.1485268

Reger, G. M., Koenen-Woods, P., Zetocha, K., Smolenski, D. J., Holloway, K. M., Rothbaum, B. O., Difede, J. A., Rizzo, A. A., Edwards-Stewart, A., Skopp, N. A., Mishkind, M., Reger, M. A., & Gahm, G. A. (2016). Randomized controlled trial of prolonged exposure using imaginal exposure vs. virtual reality exposure in active duty soldiers with deployment-related posttraumatic stress disorder (PTSD). *Journal of Consulting and Clinical Psychology*, *84*(11), 946–959. https://doi.org/10.1037/CCP0000134

Resick, P. A., Galovski, T. E., Uhlmansiek, M. O. B., Scher, C. D., Clum, G. A., & Young-Xu, Y. (2008). A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence. *Journal of Consulting and Clinical Psychology*, *76*(2), 243–258. https://doi.org/10.1037/0022-006X.76.2.243

Resick, P. A., Nishith, P., Weaver, T. L., Astin, M. C., & Feuer, C. A. (2002). A comparison of cognitive-processing therapy with prolonged exposure and a waiting condition for the treatment of chronic posttraumatic stress disorder in female rape victims. *Journal of Consulting and Clinical Psychology*, *70*(4), 867–879. https://doi.org/10.1037//0022-006X.70.4.867

Resick, P. A., Wachen, J. S., Dondanville, K. A., Pruiksma, K. E., Yarvis, J. S., Peterson, A. L., Mintz, J., Borah, E. V., Brundige, A., Hembree, E. A., Litz, B. T., Roache, J. D., & Young-McCaughan, S. (2017). Effect of Group vs Individual Cognitive Processing Therapy in Active-Duty Military Seeking Treatment for Posttraumatic Stress Disorder: A Randomized Clinical Trial. *JAMA Psychiatry*, *74*(1), 28–36. https://doi.org/10.1001/JAMAPSYCHIATRY.2016.2729

Resick, P. A., Wachen, J. S., Mintz, J., Young-McCaughan, S., Roache, J. D., Borah, A. M., Borah, E. V., Dondanville, K. A., Hembree, E. A., Litz, B. T., & Peterson, A. L. (2015). A randomized clinical trial of group cognitive processing therapy compared with group present-centered therapy for PTSD among active duty military personnel. *Journal of Consulting and Clinical Psychology*, *83*(6), 1058–1068. https://doi.org/10.1037/CCP0000016

Rothbaum, B. O., Astin, M. C., & Marsteller, F. (2005). Prolonged exposure versus Eye Movement Desensitization and Reprocessing (EMDR) for PTSD rape victims. *Journal of Traumatic Stress*, *18*(6), 607–616. https://doi.org/10.1002/jts.20069

Sack, M., Zehl, S., Otti, A., Lahmann, C., Henningsen, P., Kruse, J., & Stingl, M. (2016). A Comparison of Dual Attention, Eye Movements, and Exposure Only during Eye Movement Desensitization and Reprocessing for Posttraumatic Stress Disorder: Results from a Randomized Clinical Trial. *Psychotherapy and Psychosomatics*, *85*(6), 357–365. https://doi.org/10.1159/000447671

Schacht, R. L., Brooner, R. K., King, V. L., Kidorf, M. S., & Peirce, J. M. (2017). Incentivizing attendance to prolonged exposure for PTSD with opioid use disorder patients: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *85*(7), 689–701. https://doi.org/10.1037/CCP0000208

Schnurr, P. P., Chard, K. M., Ruzek, J. I., Chow, B. K., Resick, P. A., Foa, E. B., Marx, B. P., Friedman, M. J., Bovin, M. J., Caudle, K. L., Castillo, D., Curry, K. T., Hollifield, M., Huang, G. D., Chee, C. L., Astin, M. C., Dickstein, B., Renner, K., Clancy, C. P., . . . Shih, M.-C. (2022). Comparison of Prolonged Exposure vs Cognitive Processing Therapy for Treatment of Posttraumatic Stress Disorder Among US Veterans: A Randomized Clinical Trial. *JAMA network open*, *5*(1), e2136921-e2136921. https://doi.org/https://dx.doi.org/10.1001/jamanetworkopen.2021.36921

Schnurr, P. P., Friedman, M. J., Engel, C. C., Foa, E. B., Shea, M. T., Chow, B. K., Resick, P. A., Thurston, V., Orsillo, S. M., Haug, R., Turner, C., & Bernardy, N. (2007). Cognitive behavioral therapy for posttraumatic stress disorder in women: a randomized controlled trial. *JAMA*, *297*(8), 820–830. https://doi.org/10.1001/JAMA.297.8.820

Schnurr, P. P., Friedman, M. J., Foy, D. W., Shea, M. T., Hsieh, F. Y., Lavori, P. W., Glynn, S. M., Wattenberg, M., & Bernardy, N. C. (2003). Randomized trial of trauma-focused group therapy for posttraumatic stress disorder: results from a department of veterans affairs cooperative study. *Archives of General Psychiatry*, *60*(5), 481–489. https://doi.org/10.1001/ARCHPSYC.60.5.481

Sloan, D. M., Marx, B. P., Lee, D. J., & Resick, P. A. (2018). A Brief Exposure-Based Treatment vs Cognitive Processing Therapy for Posttraumatic Stress Disorder: A Randomized Noninferiority Clinical Trial. *JAMA Psychiatry*, *75*(3), 233–239. https://doi.org/10.1001/JAMAPSYCHIATRY.2017.4249

Sloan, D. M., Unger, W., Lee, D. J., & Beck, J. G. (2018). A Randomized Controlled Trial of Group Cognitive Behavioral Treatment for Veterans Diagnosed With Chronic Posttraumatic Stress Disorder. *Journal of Traumatic Stress*, *31*(6), 886–898. https://doi.org/10.1002/JTS.22338

Stenmark, H., Catani, C., Neuner, F., Elbert, T., & Holen, A. (2013). Treating PTSD in refugees and asylum seekers within the general health care system. A randomized controlled multicenter study. *Behaviour Research and Therapy*, *51*(10), 641–647. https://doi.org/10.1016/J.BRAT.2013.07.002

Taylor, D. J., Pruiksma, K. E., Mintz, J., Slavish, D. C., Wardle-Pinkston, S., Dietch, J. R., Dondanville, K. A., Young-McCaughan, S., Nicholson, K. L., Litz, B. T., Keane, T. M., Peterson, A. L., & Resick, P. A. (2023). Treatment of comorbid sleep disorders and posttraumatic stress disorder in US active duty military personnel: A pilot randomized clinical trial. *Journal of Traumatic Stress*, *36*(4), 712-726. https://doi.org/10.1002/jts.22939

Taylor, S., Thordarson, D. S., Fedoroff, I. C., Maxfield, L., Lovell, K., & Ogrodniczuk, J. (2003). Comparative efficacy, speed, and adverse effects of three PTSD treatments: exposure therapy, EMDR, and relaxation training. *Journal of Consulting and Clinical Psychology*, *71*(2), 330–338. https://doi.org/10.1037/0022-006X.71.2.330

Ter Heide, F. J. J., Mooren, T. M., Van De Schoot, R., De Jongh, A., & Kleber, R. J. (2016). Eye movement desensitisation and reprocessing therapy v. stabilisation as usual for refugees: randomised controlled trial. *The British Journal of Psychiatry : The Journal of Mental Science*, *209*(4), 311–318. https://doi.org/10.1192/BJP.BP.115.167775

Thompson-Hollands, J., Lunney, C. A., Sloan, D. M., Wiltsey Stirman, S., & Schnurr, P. P. (2023). Treatment length and symptom improvement in prolonged exposure and present-centered therapy for posttraumatic stress disorder: Comparing dose–response and good-enough level models in two manualized interventions. *Journal of Consulting and Clinical Psychology*, *91*(10), 596-605. https://doi.org/10.1037/ccp0000834

Trottier, K., Monson, C. M., Wonderlich, S. A., & Crosby, R. D. (2022). Results of the first randomized controlled trial of integrated cognitive-behavioral therapy for eating disorders and posttraumatic stress disorder. *Psychological Medicine*, *52*(3), 587-596. https://doi.org/https://dx.doi.org/10.1017/S0033291721004967

Van Den Berg, D. P. G., De Bont, P. A. J. M., Van Der Vleugel, B. M., De Roos, C., De Jongh, A., Van Minnen, A., & Van Der Gaag, M. (2015). Prolonged exposure vs eye movement desensitization and reprocessing vs waiting list for posttraumatic stress disorder in patients with a psychotic disorder: a randomized clinical trial. *JAMA Psychiatry*, *72*(3), 259–267. https://doi.org/10.1001/JAMAPSYCHIATRY.2014.2637

Van Der Kolk, B. A., Spinazzola, J., Blaustein, M. E., Hopper, J. W., Hopper, E. K., Korn, D. L., & Simpson, W. B. (2007). A randomized clinical trial of eye movement desensitization and reprocessing (EMDR), fluoxetine, and pill placebo in the treatment of posttraumatic stress disorder: treatment effects and long-term maintenance. *The Journal of Clinical Psychiatry*, *68*(1), 37–46. https://doi.org/10.4088/JCP.V68N0105

van Vliet, N. I., Huntjens, R. J. C., van Dijk, M. K., Bachrach, N., Meewisse, M.-L., & de Jongh, A. (2021). Phase-based treatment versus immediate trauma-focused treatment for post-traumatic stress disorder due to childhood abuse: Randomised clinical trial. *BJPsych Open*, *7*(6), 20211057-20211057. https://doi.org/https://dx.doi.org/10.1192/bjo.2021.1057

Vera, M., Reyes-Rabanillo, M. L., Juarbe, D., Pérez-Pedrogo, C., Olmo, A., Kichic, R., & Chaplin, W. F. (2011). Prolonged exposure for the treatment of Spanish-speaking Puerto Ricans with posttraumatic stress disorder: A feasibility study. *BMC Research Notes*, *4*(1), 1–8. https://doi.org/10.1186/1756-0500-4-415/FIGURES/1

Wells, A., Walton, D., Lovell, K., & Proctor, D. (2015). Metacognitive Therapy Versus Prolonged Exposure in Adults with Chronic Post-traumatic Stress Disorder: A Parallel Randomized Controlled Trial. *Cognitive Therapy and Research*, *39*(1), 70–80. https://doi.org/10.1007/S10608-014-9636-6

Yehuda, R., Pratchett, L. C., Elmes, M. W., Lehrner, A., Daskalakis, N. P., Koch, E., Makotkine, I., Flory, J. D., & Bierer, L. M. (2014). Glucocorticoid-related predictors and correlates of post-traumatic stress disorder treatment response in combat veterans. *Interface Focus*, *4*(5). https://doi.org/10.1098/RSFS.2014.0048

Yuen, E. K., Gros, D. F., Price, M., Zeigler, S., Tuerk, P. W., Foa, E. B., & Acierno, R. (2015). Randomized Controlled Trial of Home-Based Telehealth Versus In-Person Prolonged Exposure for Combat-Related PTSD in Veterans: Preliminary Results. *Journal of Clinical Psychology*, *71*(6), 500–512. https://doi.org/10.1002/JCLP.22168

Zaccari, B., Sherman, A. D. F., Febres-Cordero, S., Higgins, M., & Kelly, U. (2022). Findings from a pilot study of Trauma Center Trauma-Sensitive Yoga versus cognitive processing therapy for PTSD related to military sexual trauma among women Veterans. *Complementary therapies in medicine*, *70*, 102850-102850. https://doi.org/https://dx.doi.org/10.1016/j.ctim.2022.102850

C6. List of excluded studies

Citation	Reason for exclusion
Acierno, R., Jaffe, A. E., Gilmore, A. K., Birks, A., Denier, C., Muzzy, W., Lopez, C. M., Tuerk, P., & Grubaugh, A. L. (2021). A randomized clinical trial of in-person vs. home-based telemedicine delivery of Prolonged Exposure for PTSD in military sexual trauma survivors. *Journal of anxiety disorders*, *83*, 102461. https://doi.org/https://dx.doi.org/10.1016/j.janxdis.2021.102461	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Acierno, R., Knapp, R., Tuerk, P., Gilmore, A. K., Lejuez, C., Ruggiero, K., Muzzy, W., Egede, L., Hernandez-Tejada, M. A., & Foa, E. B. (2017). A non-inferiority trial of Prolonged Exposure for posttraumatic stress disorder: In person versus home-based telehealth. *Behaviour research and therapy*, *89*, 57-65. https://doi.org/10.1016/j.brat.2016.11.009	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Akbarian, F., Bajoghli, H., Haghighi, M., Kalak, N., Holsboer-Trachsler, E., & Brand, S. (2015). The effectiveness of cognitive behavioral therapy with respect to psychological symptoms and recovering autobiographical memory in patients suffering from post-traumatic stress disorder. *Neuropsychiatric disease and treatment*, *11*, 395-404. https://doi.org/10.2147/NDT.S79581	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Alghamdi, M., Hunt, N., & Thomas, S. (2015). The effectiveness of narrative exposure therapy with traumatised firefighters in Saudi Arabia: A randomized controlled study. *Behaviour research and therapy*, *66*, 64-71. https://doi.org/10.1016/j.brat.2015.01.008	No full PTSD-diagnosis required for inclusion
Alpert, E., Hayes, A. M., Barnes, J. B., & Sloan, D. M. (2023). Using Client Narratives to Identify Predictors of Outcome in Written Exposure Therapy and Cognitive Processing Therapy. *Behavior therapy*, *54*(2), 185-199. https://doi.org/https://dx.doi.org/10.1016/j.beth.2022.09.002	Secondary analyses
Andersson, G., Olsson, E., Ringsgard, E., Sandgren, T., Viklund, I., Andersson, C., Hesselman, Y., Johansson, R., Nordgren, L. B., & Bohman, B. (2021). Individually tailored Internet-delivered cognitive-behavioral therapy for survivors of intimate partner violence: A randomized controlled pilot trial. *Internet interventions*, *26*, 100453. https://doi.org/https://dx.doi.org/10.1016/j.invent.2021.100453	No full PTSD-diagnosis required for inclusion
Arditte Hall, K. A., Werner, K. B., Griffin, M. G., & Galovski, T. E. (2021). The effects of cognitive processing therapy + hypnosis on objective sleep quality in women with posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*, *13*(6), 652-656. https://doi.org/10.1037/tra0000970	Secondary analyses
Arntz, A., Tiesema, M., & Kindt, M. (2007). Treatment of PTSD: A comparison of imaginal exposure with and without imagery rescripting. *Journal of behavior therapy and experimental psychiatry*, *38*(4), 345-370. https://doi.org/https://doi.org/10.1016/j.jbtep.2007.10.006	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Asukai, N., Saito, A., Tsuruta, N., Kishimoto, J., & Nishikawa, T. (2010). Efficacy of exposure therapy for Japanese patients with posttraumatic stress disorder due to mixed traumatic events: A randomized controlled study. *J Trauma Stress*, *23*(6), 744-750. https://doi.org/10.1002/jts.20589	Data do not allow conclusions on the number of non-responders per experimental and control group
Bayley, P., Schulz-Heik, J., Tang, J., Mathersul, D., Avery, T., Wong, M., Zeitzer, J., Rosen, C., Burn, A., Hernandez, B., Lazzeroni, L., & Seppälä, E. (2022). Randomised clinical non-inferiority trial of breathing-based meditation and cognitive processing therapy for symptoms of post-traumatic stress disorder in military veterans. *BMJ Open*, *12*(8). https://doi.org/https://doi.org/10.1136/bmjopen-2021-056609	No full PTSD-diagnosis required for inclusion
Beidel, D. C., Frueh, B. C., Uhde, T. W., Wong, N., & Mentrikoski, J. M. (2011). Multicomponent behavioral treatment for chronic combat-related posttraumatic stress disorder: a randomized controlled trial. *J Anxiety Disord*, *25*(2), 224-231. https://doi.org/10.1016/j.janxdis.2010.09.006	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Bellehsen, M., Stoycheva, V., Cohen, B. H., & Nidich, S. (2022). A Pilot Randomized Controlled Trial of Transcendental Meditation as Treatment for Posttraumatic Stress Disorder in Veterans. *Journal of traumatic stress*, *35*(1), 22-31. https://doi.org/https://dx.doi.org/10.1002/jts.22665	Not a psychotherapeutic guideline-recommended intervention
Benfer, N., Darnell, B. C., Rusowicz-Orazem, L., Fielstein, E. M., Grunthal, B., Lehavot, K., Marx, B. P., & Litz, B. (2023). An examination of the criterion-related validity of varying methods of indexing clinically significant change in posttraumatic stress disorder treatment. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0001479	Secondary analyses
Bichescu, D., Neuner, F., Schauer, M., & Elbert, T. (2007). Narrative exposure therapy for political imprisonment-related chronic posttraumatic stress disorder and depression. *Behav Res Ther*, *45*(9), 2212-2220. https://doi.org/10.1016/j.brat.2006.12.006	Post-assessment more than six weeks after the end of treatment

Citation	Reason for exclusion
Bottche, M., Wagner, B., Vohringer, M., Heinrich, M., Stein, J., Selmo, P., Stammel, N., & Knaevelsrud, C. (2021). Is only one cognitive technique also effective? Results from a randomized controlled trial of two different versions of an internet-based cognitive behavioural intervention for post-traumatic stress disorder in Arabic-speaking countries. *European Journal of Psychotraumatology*, *12*(1), 1943870. https://doi.org/https://dx.doi.org/10.1080/20008198.2021.1943870	Not a psychotherapeutic guideline-recommended intervention
Bragesjo, M., Arnberg, F. K., Olofsdotter Lauri, K., Aspvall, K., Sarnholm, J., & Andersson, E. (2023). Condensed Internet-delivered prolonged exposure provided soon after trauma: a randomised trial. *Psychological Medicine*, *53*(5), 1989-1998. https://doi.org/https://dx.doi.org/10.1017/S0033291721003706	No full PTSD-diagnosis required for inclusion
Bragesjo, M., Arnberg, F. K., Sarnholm, J., Olofsdotter Lauri, K., & Andersson, E. (2021). Condensed internet-delivered prolonged exposure provided soon after trauma: A randomised pilot trial. *Internet interventions*, *23*, 100358. https://doi.org/https://dx.doi.org/10.1016/j.invent.2020.100358	No full PTSD-diagnosis required for inclusion
Brom, D., Kleber, R. J., & Defares, P. B. (1989). Brief psychotherapy for posttraumatic stress disorders. *Journal of Consulting and Clinical Psychology*, *57*(5), 607. https://doi.org/10.1037//0022-006x.57.5.607	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Brown, D. G., Flanagan, J. C., Jarnecke, A., Killeen, T. K., & Back, S. E. (2022). Ethnoracial differences in treatment-seeking veterans with substance use disorders and co-occurring PTSD: Presenting characteristics and response to integrated exposure-based treatment. *Journal of ethnicity in substance abuse*, *21*(3), 1141-1164. https://doi.org/https://dx.doi.org/10.1080/15332640.2020.1836699	Secondary analyses
Bryant, R., Dawson, K., Azevedo, S., Yadav, S., Cahill, C., Kenny, L., Maccallum, F., Tran, J., Rawson, N., Tockar, J., Garber, B., & Keyan, D. (2022). Augmenting trauma-focused psychotherapy for post-traumatic stress disorder with brief aerobic exercise in Australia: a randomised clinical trial. *Lancet Psychiatry*, *10*(1), 21-29. https://doi.org/https://doi.org/10.1016/S2215-0366(22)00368-6	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Bryant, R., Kenny, L., Rawson, N., Cahill, C., Joscelyne, A., Garber, B., Tockar, J., Tran, J., & Dawson, K. (2021). Two-year follow-up of trauma-focused cognitive behavior therapy for posttraumatic stress disorder in emergency service personnel: a randomized clinical trial. *Depression and Anxiety*, *38*(11), 1131-1137. https://doi.org/https://doi.org/10.1002/da.23214	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Buhmann, C. B., Nordentoft, M., Ekstroem, M., Carlsson, J., & Mortensen, E. L. (2016). The effect of flexible cognitive-behavioural therapy and medical treatment, including antidepressants on post-traumatic stress disorder and depression in traumatised refugees: pragmatic randomised controlled clinical trial. *Br J Psychiatry*, *208*(3), 252-259. https://doi.org/10.1192/bjp.bp.114.150961	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Burrichter, K., & Logan, W. (2023). The effectiveness of eye movement desensitization and reprocessing in the treatment of post-traumatic stress disorder: a randomized controlled trial. *Revista de Psiquiatria Clinica*, *50*(1), 63-70. https://doi.org/https://dx.doi.org/10.15761/0101-60830000000523	Not a randomized controlled trial
Burton, M. S., Cooper, A. A., Mello, P. G., Feeny, N. C., & Zoellner, L. A. (2021). Latent Profiles of Comorbid Depression as Predictors of PTSD Treatment Outcome. *Behavior therapy, 52*(4), 970-981. https://doi.org/https://dx.doi.org/10.1016/j.beth.2020.12.005	Secondary analyses
Burton, M. S., Marks, E. H., Bedard-Gilligan, M. A., Feeny, N. C., & Zoellner, L. A. (2021). The effect of perceived life stress on posttraumatic stress disorder treatment outcome. *Journal of Traumatic Stress, 34*(6), 1219-1227. https://doi.org/https://dx.doi.org/10.1002/jts.22744	Secondary analyses
Butler, O., Willmund, G., Gleich, T., Gallinat, J., Kühn, S., & Zimmermann, P. (2018). Hippocampal gray matter increases following multimodal psychological treatment for combat-related post-traumatic stress disorder. *Brain Behav*, *8*(5), e00956. https://doi.org/10.1002/brb3.956	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Capone, C., Presseau, C., Saunders, E., Eaton, E., Hamblen, J., & McGovern, M. (2018). Is Integrated CBT Effective in Reducing PTSD Symptoms and Substance Use in Iraq and Afghanistan Veterans? Results from a Randomized Clinical Trial. *Cognitive therapy and research*, *42*(6), 735-746. https://doi.org/10.1007/s10608-018-9931-8	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms

Citation	Reason for exclusion
Carlson, J. G., Chemtob, C. M., Rusnak, K., Hedlund, N. L., & Muraoka, M. Y. (1998). Eye movement desensitization and reprocessing (EDMR) treatment for combat-related posttraumatic stress disorder. *J Trauma Stress*, *11*(1), 3-24. https://doi.org/10.1023/a:1024448814268	Post-assessment more than six weeks after the end of treatment
Carlsson, J., Sonne, C., Vindbjerg, E., & Mortensen, E. L. (2018). Stress management versus cognitive restructuring in trauma-affected refugees-A pragmatic randomised study. *Psychiatry Res*, *266*, 116-123. https://doi.org/10.1016/j.psychres.2018.05.015	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Classen, C., Koopman, C., Nevillmanning, K., & Spiegel, D. (2001). A preliminary report comparing trauma-focused and present-focused group therapy against a wait-listed condition among childhood sexual abuse survivors with PTSD. *Journal of Aggression, Maltreatment & Trauma*, *4*(2), 265-288. https://doi.org/10.1300/J146v04n02_12	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Claudat, K., Reilly, E. E., Convertino, A. D., Trim, J., Cusack, A., & Kaye, W. H. (2022). Integrating evidence-based PTSD treatment into intensive eating disorders treatment: a preliminary investigation. *Eating and weight disorders : EWD, 27*(8), 3599-3607. https://doi.org/https://dx.doi.org/10.1007/s40519-022-01500-9	Not a randomized controlled trial
Coffey, S. F., Schumacher, J. A., Nosen, E., Littlefield, A. K., Henslee, A. M., Lappen, A., & Stasiewicz, P. R. (2016). Trauma-focused exposure therapy for chronic posttraumatic stress disorder in alcohol and drug dependent patients: A randomized controlled trial. *Psychol Addict Behav*, *30*(7), 778-790. https://doi.org/10.1037/adb0000201	Data do not allow conclusions on the number of non-responders per experimental and control group
Cottraux, J., Note, I., Yao, S. N., de Mey-Guillard, C., Bonasse, F., Djamoussian, D., Mollard, E., Note, B., & Chen, Y. (2008). Randomized controlled comparison of cognitive behavior therapy with Rogerian supportive therapy in chronic post-traumatic stress disorder: a 2-year follow-up. *Psychother Psychosom*, *77*(2), 101-110. https://doi.org/10.1159/000112887	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Cox, K. S., Wiener, D., Rauch, S. A. M., Tuerk, P. W., Wangelin, B., & Acierno, R. (2023). Individual symptom reduction and post-treatment severity: Varying levels of symptom amelioration in response to prolonged exposure for post-traumatic stress disorder. *Psychological Services, 20*(1), 94-106. https://doi.org/https://dx.doi.org/10.1037/ser0000579	Secondary analyses
Crocker, L. D., Sullan, M. J., Jurick, S. M., Thomas, K. R., Davey, D. K., Hoffman, S. N., Twamley, E. W., & Jak, A. J. (2023). Baseline executive functioning moderates treatment-related changes in quality of life in veterans with posttraumatic stress disorder and comorbid traumatic brain injury. *Journal of Traumatic Stress, 36*(1), 94-105. https://doi.org/https://dx.doi.org/10.1002/jts.22883	Secondary analyses
Davis, L. W., Luedtke, B. L., Monson, C., Siegel, A., Daggy, J. K., Yang, Z., Bair, M. J., Brustuen, B., & Ertl, M. (2021). Testing adaptations of cognitive-behavioral conjoint therapy for PTSD: A randomized controlled pilot study with veterans. *Couple and Family Psychology: Research and Practice, 10*(2), 71-86. https://doi.org/10.1037/cfp0000148	Not a psychotherapeutic guideline-recommended intervention
Decker, K. P., Deaver, S. P., Abbey, V., Campbell, M., & Turpin, C. (2018). Quantitatively improved treatment outcomes for combat-associated PTSD with adjunctive art therapy: Randomized controlled trial. *Art Therapy*, *35*(4), 184-194. https://doi.org/10.1080/07421656.2018.1540822	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Dedert, E. A., Resick, P. A., Dennis, P. A., Wilson, S. M., Moore, S. D., & Beckham, J. C. (2019). Pilot trial of a combined cognitive processing therapy and smoking cessation treatment. *Journal of addiction medicine*, *13*(4), 322. https://doi.org/10.1097/ADM.0000000000000502	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Devilly, G., Spence, S., & Rapee, R. (1998). Statistical and reliable change with eye movement desensitization and reprocessing: Treating trauma within a veteran population. *Behavior therapy*, *29*(3), 435-455. https://doi.org/10.1016/S0005-7894(98)80042-7	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Devilly, G. J., & Spence, S. H. (1999). The relative efficacy and treatment distress of EMDR and a cognitive-behavior trauma treatment protocol in the amelioration of posttraumatic stress disorder. *J Anxiety Disord*, *13*(1-2), 131-157. https://doi.org/10.1016/s0887-6185(98)00044-9	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Dorrepaal, E., Thomaes, K., Smit, J. H., van Balkom, A. J., Veltman, D. J., Hoogendoorn, A. W., & Draijer, N. (2012). Stabilizing group treatment for complex posttraumatic stress disorder related to child abuse based on psychoeducation and cognitive behavioural therapy: a multisite randomized controlled trial. *Psychother Psychosom*, *81*(4), 217-225. https://doi.org/10.1159/000335044	Not a psychotherapeutic guideline-recommended intervention

Citation	Reason for exclusion
Duffy, M., Gillespie, K., & Clark, D. M. (2007). Post-traumatic stress disorder in the context of terrorism and other civil conflict in Northern Ireland: randomised controlled trial. *BMJ*, *334*(7604), 1147. https://doi.org/10.1136/bmj.39021.846852.BE	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Duran, É., Corchs, F., Vianna, A., Araujo, A., Del Real, N., Silva, C., Ferreira, A., Francez, P., Godoi, C., Silveira, H., Matsumoto, L., Gebara, C., Neto, T., Chilvarquer, R., de Siqueira, L., Bernik, M., & Neto, F. (2021). A randomized clinical trial to assess the efficacy of trial-based cognitive therapy compared to prolonged exposure for post-traumatic stress disorder: preliminary findings. *CNS Spectrums, 26*(4), 427-434. https://doi.org/https://doi.org/10.1017/S1092852920001455	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Echeburúa, E., de Corral, P., Sarasua, B., & Zubizarreta, I. (1996). Treatment of acute posttraumatic stress disorder in rape victims: An experimental study. *Journal of anxiety disorders*, *10*(3), 185-199. https://doi.org/10.1016/0887-6185(96)89842-2	Participants under 17 years of age
Edgar, N., Bennett, A., Dunn, N., MacLean, S., Hatcher, S., N.E, E., A, B., N.S, D., & S.E, M. (2022). Feasibility and acceptability of Narrative Exposure Therapy to treat individuals with PTSD who are homeless or vulnerably housed: a pilot randomized controlled trial. *Pilot and Feasibility Studies, 8*(1), 83-83. https://doi.org/https://dx.doi.org/10.1186/s40814-022-01043-x	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Eskici, H. S., Hinton, D. E., Jalal, B., Yurtbakan, T., & Acarturk, C. (2023). Culturally adapted cognitive behavioral therapy for Syrian refugee women in Turkey: A randomized controlled trial. *Psychological trauma : theory, research, practice and policy, 15*(2), 189-198. https://doi.org/https://dx.doi.org/10.1037/tra0001138	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Fan, Y., Shi, Y., Zhang, J., Sun, D., Wang, X., Fu, G., Mo, D., Wen, J., Xiao, X., & Kong, L. (2021). The effects of narrative exposure therapy on COVID-19 patients with post-traumatic stress symptoms: A randomized controlled trial. *Journal of Affective Disorders, 293*, 141-147. https://doi.org/https://dx.doi.org/10.1016/j.jad.2021.06.019	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Feurer, C., Francis, J., Ajilore, O., Craske, M. G., Phan, K. L., & Klumpp, H. (2021). Emotion Regulation and Repetitive Negative Thinking Before and After CBT and SSRI Treatment of Internalizing Psychopathologies. *Cognitive Therapy and Research, 45*(6), 1064-1076. https://doi.org/https://dx.doi.org/10.1007/s10608-021-10222-8	No full PTSD-diagnosis required for inclusion
Foa, E. B., Bredemeier, K., Acierno, R., Rosenfield, D., Muzzy, W., Tuerk, P. W., Zandberg, L. J., Hart, S., Young-McCaughan, S., Peterson, A. L., & McLean, C. P. (2022). The efficacy of 90-min versus 60-min sessions of prolonged exposure for PTSD: A randomized controlled trial in active-duty military personnel. *Journal of Consulting and Clinical Psychology, 90*(6), 503-512. https://doi.org/https://dx.doi.org/10.1037/ccp0000739	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Foa, E. B., Dancu, C. V., Hembree, E. A., Jaycox, L. H., Meadows, E. A., & Street, G. P. (1999). A comparison of exposure therapy, stress inoculation training, and their combination for reducing posttraumatic stress disorder in female assault victims. *J Consult Clin Psychol*, *67*(2), 194-200. https://doi.org/10.1037//0022-006x.67.2.194	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Foa, E. B., Hembree, E. A., Cahill, S. P., Rauch, S. A., Riggs, D. S., Feeny, N. C., & Yadin, E. (2005). Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: outcome at academic and community clinics. *J Consult Clin Psychol*, *73*(5), 953-964. https://doi.org/10.1037/0022-006x.73.5.953	Post-assessment more than six weeks after the end of treatment
Foa, E. B., Rothbaum, B. O., Riggs, D. S., & Murdock, T. B. (1991). Treatment of posttraumatic stress disorder in rape victims: a comparison between cognitive-behavioral procedures and counseling. *J Consult Clin Psychol*, *59*(5), 715-723. https://doi.org/10.1037//0022-006x.59.5.715	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Fonzo, G. A., Goodkind, M. S., Oathes, D. J., Zaiko, Y. V., Harvey, M., Peng, K. K., Weiss, M. E., Thompson, A. L., Zack, S. E., Lindley, S. E., Arnow, B. A., Jo, B., Gross, J. J., Rothbaum, B. O., & Etkin, A. (2017). PTSD Psychotherapy Outcome Predicted by Brain Activation During Emotional Reactivity and Regulation. *Am J Psychiatry*, *174*(12), 1163-1174. https://doi.org/10.1176/appi.ajp.2017.16091072	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Frommberger, U., Stieglitz, R. D., Nyberg, E., Richter, H., Novelli-Fischer, U., Angenendt, J., Zaninelli, R., & Berger, M. (2004). Comparison between paroxetine and behaviour therapy in patients with posttraumatic stress disorder (PTSD): A pilot study. *Int J Psychiatry Clin Pract*, *8*(1), 19-23. https://doi.org/10.1080/13651500310004803	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD

Citation	Reason for exclusion
Frueh, B. C., Monnier, J., Yim, E., Grubaugh, A. L., Hamner, M. B., & Knapp, R. G. (2007). A randomized trial of telepsychiatry for post-traumatic stress disorder. *J Telemed Telecare*, *13*(3), 142-147. https://doi.org/10.1258/135763307780677604	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Galovski, T. E., Blain, L. M., Mott, J. M., Elwood, L., & Houle, T. (2012). Manualized therapy for PTSD: flexing the structure of cognitive processing therapy. *J Consult Clin Psychol*, *80*(6), 968-981. https://doi.org/10.1037/a0030600	Data do not allow conclusions on the number of non-responders per experimental and control group
Galovski, T. E., Harik, J. M., Blain, L. M., Elwood, L., Gloth, C., & Fletcher, T. D. (2016). Augmenting cognitive processing therapy to improve sleep impairment in PTSD: A randomized controlled trial. *J Consult Clin Psychol*, *84*(2), 167-177. https://doi.org/10.1037/ccp0000059	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Gamito, P., Oliveira, J., Rosa, P., Morais, D., Duarte, N., Oliveira, S., & Saraiva, T. (2010). PTSD elderly war veterans: a clinical controlled pilot study. *Cyberpsychol Behav Soc Netw*, *13*(1), 43-48. https://doi.org/10.1089/cyber.2009.0237	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Gersons, B. P., Carlier, I. V., Lamberts, R. D., & van der Kolk, B. A. (2000). Randomized clinical trial of brief eclectic psychotherapy for police officers with posttraumatic stress disorder. *J Trauma Stress*, *13*(2), 333-347. https://doi.org/10.1023/a:1007793803627	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Ghafoori, B., Hansen, M. C., Garibay, E., & Korosteleva, O. (2017). Feasibility of Training Frontline Therapists in Prolonged Exposure: A Randomized Controlled Pilot Study of Treatment of Complex Trauma in Diverse Victims of Crime and Violence. *J Nerv Ment Dis*, *205*(4), 283-293. https://doi.org/10.1097/nmd.0000000000000659	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Hahn, C. K., Jarnecke, A. M., Calhoun, C., Melkonian, A., Flanagan, J. C., & Back, S. E. (2022). Sexual harassment and assault during deployment: Associations with treatment outcomes among Veterans with co-occurring PTSD and SUD. *Military Psychology, 34*(1), 12-22. https://doi.org/10.1080/08995605.2021.1964901	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Haller, H., Mitzinger, D., & Cramer, H. (2023). The integration of yoga breathing techniques in cognitive behavioral therapy for post-traumatic stress disorder: A pragmatic randomized controlled trial. *Frontiers in Psychiatry*, *14*, 1101046. https://doi.org/https://dx.doi.org/10.3389/fpsyt.2023.1101046	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Held, P., Kovacevic, M., Petrey, K., Meade, E. A., Pridgen, S., Montes, M., Werner, B., Miller, M. L., Smith, D. L., Kaysen, D., & Karnik, N. S. (2022). Treating posttraumatic stress disorder at home in a single week using 1-week virtual massed cognitive processing therapy. *Journal of Traumatic Stress, 35*(4), 1215-1225. https://doi.org/https://dx.doi.org/10.1002/jts.22831	No full PTSD-diagnosis required for inclusion
Hien, D. A., Cohen, L. R., Miele, G. M., Litt, L. C., & Capstick, C. (2004). Promising treatments for women with comorbid PTSD and substance use disorders. *Am J Psychiatry*, *161*(8), 1426-1432. https://doi.org/10.1176/appi.ajp.161.8.1426	No full PTSD-diagnosis required for inclusion
Hien, D. A., Wells, E. A., Jiang, H., Suarez-Morales, L., Campbell, A. N., Cohen, L. R., Miele, G. M., Killeen, T., Brigham, G. S., Zhang, Y., Hansen, C., Hodgkins, C., Hatch-Maillette, M., Brown, C., Kulaga, A., Kristman-Valente, A., Chu, M., Sage, R., Robinson, J. A., . . . Nunes, E. V. (2009). Multisite randomized trial of behavioral interventions for women with co-occurring PTSD and substance use disorders. *J Consult Clin Psychol*, *77*(4), 607-619. https://doi.org/10.1037/a0016227	No full PTSD-diagnosis required for inclusion
Hijazi, A. M., Lumley, M. A., Ziadni, M. S., Haddad, L., Rapport, L. J., & Arnetz, B. B. (2014). Brief narrative exposure therapy for posttraumatic stress in Iraqi refugees: a preliminary randomized clinical trial. *J Trauma Stress*, *27*(3), 314-322. https://doi.org/10.1002/jts.21922	No full PTSD-diagnosis required for inclusion
Hinton, D. E., Hofmann, S. G., Pollack, M. H., & Otto, M. W. (2009). Mechanisms of efficacy of CBT for Cambodian refugees with PTSD: improvement in emotion regulation and orthostatic blood pressure response. *CNS Neurosci Ther*, *15*(3), 255-263. https://doi.org/10.1111/j.1755-5949.2009.00100.x	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Hoffart, A., Øktedalen, T., Langkaas, T. F., & Wampold, B. E. (2013). Alliance and outcome in varying imagery procedures for PTSD: a study of within-person processes. *J Couns Psychol*, *60*(4), 471-482. https://doi.org/10.1037/a0033604	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms

Citation	Reason for exclusion
Hunt, C., Park, J., Bomyea, J., & Colvonen, P. J. (2023). Sleep efficiency predicts improvements in fear extinction and PTSD symptoms during prolonged exposure for veterans with comorbid insomnia. *Psychiatry Research*, *324*, 115216. https://doi.org/https://dx.doi.org/10.1016/j.psychres.2023.115216	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Ivarsson, D., Blom, M., Hesser, H., Carlbring, P., Enderby, P., Nordberg, R., & Andersson, G. (2014). Guided internet-delivered cognitive behavior therapy for post-traumatic stress disorder: a randomized controlled trial. *Internet interventions*, *1*(1), 33-40. https://doi.org/10.1016/j.invent.2014.03.002	Not a psychotherapeutic guideline recommended intervention
Jacob, N., Neuner, F., Maedl, A., Schaal, S., & Elbert, T. (2014). Dissemination of psychotherapy for trauma spectrum disorders in postconflict settings: a randomized controlled trial in Rwanda. *Psychother Psychosom*, *83*(6), 354-363. https://doi.org/10.1159/000365114	Post-assessment more than six weeks after the end of treatment
Jak, A. J., Jurick, S., Crocker, L. D., Sanderson-Cimino, M., Aupperle, R., Rodgers, C. S., Thomas, K. R., Boyd, B., Norman, S. B., Lang, A. J., Keller, A. V., Schiehser, D. M., & Twamley, E. W. (2019). SMART-CPT for veterans with comorbid post-traumatic stress disorder and history of traumatic brain injury: a randomised controlled trial. *J Neurol Neurosurg Psychiatry*, *90*(3), 333-341. https://doi.org/10.1136/jnnp-2018-319315	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Jamshidi, F., Rajabi, S., & Dehghani, Y. (2021). How to heal their psychological wounds? Effectiveness of EMDR therapy on post-traumatic stress symptoms, mind-wandering and suicidal ideation in Iranian child abuse victims. *Counselling and Psychotherapy Research*, *21*(2), 412-421. https://doi.org/https://doi.org/10.1002/capr.12339	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Jensen, J. A. (1994). An investigation of eye movement desensitization and reprocessing (EMD/R) as a treatment for posttraumatic stress disorder (PTSD) symptoms of Vietnam combat veterans. *Behavior therapy*, *25*(2), 311-325. https://doi.org/10.1016/S0005-7894(05)80290-4	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Katz, L., Douglas, S., Zaleski, K., Williams, J., Huffman, C., & Cojucar, G. (2014). Comparing Holographic Reprocessing and Prolonged Exposure for Women Veterans with Sexual Trauma: A Pilot Randomized Trial. *Journal of Contemporary Psychotherapy*, *44*(1). https://doi.org/10.1007/s10879-013-9248-6	No full PTSD-diagnosis required for inclusion
Keane, T. M., Fairbank, J. A., Caddell, J. M., & Zimering, R. T. (1989). Implosive (flooding) therapy reduces symptoms of PTSD in Vietnam combat veterans. *Behavior therapy*, *20*(2), 245-260. https://doi.org/10.1016/S0005-7894(89)80072-3	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Kehle-Forbes, S. M., Chen, S., Polusny, M. A., Lynch, K. G., Koffel, E., Ingram, E., Foa, E. B., Van Horn, D. H. A., Drapkin, M. L., Yusko, D. A., & Oslin, D. W. (2019). A randomized controlled trial evaluating integrated versus phased application of evidence-based psychotherapies for military veterans with comorbid PTSD and substance use disorders. *Drug Alcohol Depend*, *205*, 107647. https://doi.org/10.1016/j.drugalcdep.2019.107647	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Khan, A., Ullah, F., Abid, O., & Awan, K. H. (2021). Efficacy of cognitive behavioral therapy in post-traumatic stress disorder among spinal cord injury patients: A randomized controlled pilot study. *Journal of Evidence-Based Psychotherapies, 21*(2), 143-162. https://doi.org/10.24193/jebp.2021.2.16	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Kleindienst, N., Steil, R., Priebe, K., Muller-Engelmann, M., Biermann, M., Fydrich, T., Schmahl, C., & Bohus, M. (2021). Treating adults with a dual diagnosis of borderline personality disorder and posttraumatic stress disorder related to childhood abuse: Results from a randomized clinical trial. *Journal of Consulting and Clinical Psychology*, *89*(11), 925-936. https://doi.org/https://dx.doi.org/10.1037/ccp0000687	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Knaevelsrud, C., Böttche, M., Pietrzak, R. H., Freyberger, H. J., & Kuwert, P. (2017). Efficacy and Feasibility of a Therapist-Guided Internet-Based Intervention for Older Persons with Childhood Traumatization: A Randomized Controlled Trial. *Am J Geriatr Psychiatry*, *25*(8), 878-888. https://doi.org/10.1016/j.jagp.2017.02.024	No full PTSD-diagnosis required for inclusion
Knaevelsrud, C., Brand, J., Lange, A., Ruwaard, J., & Wagner, B. (2015). Web-based psychotherapy for posttraumatic stress disorder in war-traumatized Arab patients: randomized controlled trial. *J Med Internet Res*, *17*(3), e71. https://doi.org/10.2196/jmir.3582	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Koebach, A., Carleial, S., Elbert, T., Schmitt, S., & Robjant, K. (2021). Treating trauma and aggression with narrative exposure therapy in former child and adult soldiers: A randomized controlled trial in Eastern DR Congo. *Journal of Consulting and Clinical Psychology*, *89*(3), 143.	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms

Citation	Reason for exclusion
Koochaki, M., Mahmoodi, Z., Esmaelzadeh–Saeieh, S., Kabir, K., & Dolatian, M. (2017). Effects of Cognitive-Behavioral Counseling on Posttraumatic Stress Disorder in Mothers with Infants Hospitalized at Neonatal Intensive Care Units: A Randomized Controlled Trial. *Iranian Journal of Psychiatry and Behavioral Sciences*, *12*(4). https://doi.org/10.5812/ijpbs.65159	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Krupnick, J. L., Green, B. L., Amdur, R., Alaoui, A., Belouali, A., Roberge, E., Cueva, D., Roberts, M., Melnikoff, E., & Dutton, M. A. (2017). An Internet-based writing intervention for PTSD in veterans: A feasibility and pilot effectiveness trial. *Psychol Trauma*, *9*(4), 461-470. https://doi.org/10.1037/tra0000176	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Kullberg, M.-L. J., Schoorl, M., Oprel, D. A. C., Hoeboer, C. M., Smit, F., van der Does, W., de Kleine, R. A., van Minnen, A., & van den Hout, W. (2023). Exposure-based treatments for childhood abuse-related post-traumatic stress disorder in adults: a health-economic evaluation. *European Journal of Psychotraumatology*, *14*(1), 2171752. https://doi.org/https://dx.doi.org/10.1080/20008066.2023.2171752	Secondary analyses
Larsen, S. E., Mackintosh, M.-A., La Bash, H., Evans, W. R., Suvak, M. K., Shields, N., Lane, J. E. M., Sijercic, I., Monson, C. M., & Wiltsey Stirman, S. (2022). Temporary PTSD symptom increases among individuals receiving CPT in a hybrid effectiveness-implementation trial: Potential predictors and association with overall symptom change trajectory. *Psychological trauma : theory, research, practice and policy*, *14*(5), 853-861. https://doi.org/https://dx.doi.org/10.1037/tra0000545	Secondary analyses
Lee, C., Gavriel, H., Drummond, P., Richards, J., & Greenwald, R. (2002). Treatment of PTSD: stress inoculation training with prolonged exposure compared to EMDR. *J Clin Psychol*, *58*(9), 1071-1089. https://doi.org/10.1002/jclp.10039	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Lee, D. J., Marx, B. P., Thompson-Hollands, J., Gallagher, M. W., Resick, P. A., & Sloan, D. M. (2021). The temporal sequence of change in PTSD symptoms and hypothesized mediators in Cognitive Processing Therapy and Written Exposure Therapy for PTSD. *Behaviour Research and Therapy*, *144*, 103918-103918. https://doi.org/https://dx.doi.org/10.1016/j.brat.2021.103918	Secondary analyses
Lely, J. C. G., Ter Heide, F. J. J., Moerbeek, M., Knipscheer, J. W., & Kleber, R. J. (2022). Psychopathology and resilience in older adults with posttraumatic stress disorder: a randomized controlled trial comparing narrative exposure therapy and present-centered therapy. *European Journal of Psychotraumatology*, *13*(1), 2022277-2022277. https://doi.org/https://dx.doi.org/10.1080/20008198.2021.2022277	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Lewis, N. V., Gregory, A., Feder, G. S., Angill-Williams, A., Bates, S., Glynn, J., Halliwell, G., Hawcroft, C., Kessler, D., Lawton, M., Leach, R., Millband, S., Pitt, K., Zammit, S., & Malpass, A. (2023). Trauma-specific mindfulness-based cognitive therapy for women with post-traumatic stress disorder and a history of domestic abuse: intervention refinement and a randomised feasibility trial (coMforT study). *Pilot and Feasibility Studies*, *9*(1), 112. https://doi.org/https://dx.doi.org/10.1186/s40814-023-01335-w	Secondary analyses
Lin, Y., Lv, W., Xu, J., Jiang, Y., & Chen, Z. (2022). Effectiveness of Cognitive Behavior Therapy Combined with Eye Movement Desensitization and Reprocessing on Psychological Problems and Life Quality in Patients' Postfacial Trauma. *Computational and mathematical methods in medicine*, *2022*, 7822847-7822847. https://doi.org/https://dx.doi.org/10.1155/2022/7822847	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Liu, L., Thorp, S. R., Moreno, L., Wells, S. Y., Glassman, L. H., Busch, A. C., Zamora, T., Rodgers, C. S., Allard, C. B., Morland, L. A., & Agha, Z. (2020). Videoconferencing psychotherapy for veterans with PTSD: Results from a randomized controlled non-inferiority trial. *J Telemed Telecare*, *26*(9), 507-519. https://doi.org/10.1177/1357633x19853947	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
LoSavio, S. T., Hale, W. J., Moring, J. C., Blankenship, A. E., Dondanville, K. A., Wachen, J. S., Mintz, J., Peterson, A. L., Litz, B. T., Young-McCaughan, S., Yarvis, J. S., & Resick, P. A. (2021). Efficacy of individual and group cognitive processing therapy for military personnel with and without child abuse histories. *Journal of Consulting and Clinical Psychology*, *89*(5), 476-482. https://doi.org/https://dx.doi.org/10.1037/ccp0000641	Secondary analyses
Lyons, R., Helm, J., Luciano, M., Haller, M., & Norman, S. B. (2023). The role of posttraumatic cognitions in integrated treatments for co-occurring posttraumatic stress disorder and alcohol use disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0001540	Secondary analyses

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Maieritsch, K. P., Smith, T. L., Hessinger, J. D., Ahearn, E. P., Eickhoff, J. C., & Zhao, Q. (2016). Randomized controlled equivalence trial comparing videoconference and in person delivery of cognitive processing therapy for PTSD. *J Telemed Telecare*, *22*(4), 238-243. https://doi.org/10.1177/1357633x15596109	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Marks, I., Lovell, K., Noshirvani, H., Livanou, M., & Thrasher, S. (1998). Treatment of posttraumatic stress disorder by exposure and/or cognitive restructuring: a controlled study. *Arch Gen Psychiatry*, *55*(4), 317-325. https://doi.org/10.1001/archpsyc.55.4.317	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
McGeary, D. D., Resick, P. A., Penzien, D. B., McGeary, C. A., Houle, T. T., Eapen, B. C., Jaramillo, C. A., Nabity, P. S., Reed, D. E., 2nd, Moring, J. C., Bira, L. M., Hansen, H. R., Young-McCaughan, S., Cobos, B. A., Mintz, J., Keane, T. M., & Peterson, A. L. (2022). Cognitive Behavioral Therapy for Veterans With Comorbid Posttraumatic Headache and Posttraumatic Stress Disorder Symptoms: A Randomized Clinical Trial. *JAMA neurology*, *79*(8), 746-757. https://doi.org/https://dx.doi.org/10.1001/jamaneurol.2022.1567	No full PTSD-diagnosis required for inclusion
McGovern, M. P., Lambert-Harris, C., Xie, H., Meier, A., McLeman, B., & Saunders, E. (2015). A randomized controlled trial of treatments for co-occurring substance use disorders and post-traumatic stress disorder. *Addiction*, *110*(7), 1194-1204. https://doi.org/10.1111/add.12943	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
McGuire Stanbury, T. M., Drummond, P. D., Laugharne, J., Kullack, C., & Lee, C. W. (2020). Comparative efficiency of EMDR and prolonged exposure in treating posttraumatic stress disorder: A randomized trial. *Journal of EMDR Practice and Research*, *14*(1), 2-12. https://doi.org/10.1891/1933-3196.14.1.2	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
McLay, R. N., Wood, D. P., Webb-Murphy, J. A., Spira, J. L., Wiederhold, M. D., Pyne, J. M., & Wiederhold, B. K. (2011). A randomized, controlled trial of virtual reality-graded exposure therapy for post-traumatic stress disorder in active duty service members with combat-related post-traumatic stress disorder. *Cyberpsychol Behav Soc Netw*, *14*(4), 223-229. https://doi.org/10.1089/cyber.2011.0003	Not a psychotherapeutic guideline recommended intervention
Mills, K. L., Teesson, M., Back, S. E., Brady, K. T., Baker, A. L., Hopwood, S., Sannibale, C., Barrett, E. L., Merz, S., Rosenfeld, J., & Ewer, P. L. (2012). Integrated exposure-based therapy for co-occurring posttraumatic stress disorder and substance dependence: a randomized controlled trial. *Jama*, *308*(7), 690-699. https://doi.org/10.1001/jama.2012.9071	Post-assessment more than six weeks after the end of treatment
Morath, J., Gola, H., Sommershof, A., Hamuni, G., Kolassa, S., Catani, C., Adenauer, H., Ruf-Leuschner, M., Schauer, M., Elbert, T., Groettrup, M., & Kolassa, I. T. (2014). The effect of trauma-focused therapy on the altered T cell distribution in individuals with PTSD: evidence from a randomized controlled trial. *J Psychiatr Res*, *54*, 1-10. https://doi.org/10.1016/j.jpsychires.2014.03.016	Post-assessment more than six weeks after the end of treatment
Moreira, A., Moreira, A. C., & Rocha, J. C. (2022). Randomized Controlled Trial: Cognitive-Narrative Therapy for IPV Victims. *Journal of Interpersonal Violence*, *37*(5-6), NP2998-NP3014. https://doi.org/https://dx.doi.org/10.1177/0886260520943719	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Morland, L. A., Mackintosh, M. A., Greene, C. J., Rosen, C. S., Chard, K. M., Resick, P., & Frueh, B. C. (2014). Cognitive processing therapy for posttraumatic stress disorder delivered to rural veterans via telemental health: a randomized noninferiority clinical trial. *J Clin Psychiatry*, *75*(5), 470-476. https://doi.org/10.4088/JCP.13m08842	Data do not allow conclusions on the number of non-responders per experimental and control group
Morland, L. A., Mackintosh, M. A., Rosen, C. S., Willis, E., Resick, P., Chard, K., & Frueh, B. C. (2015). Telemedicine versus in-person delivery of cognitive processing therapy for women with posttraumatic stress disorder: a randomized noninferiority trial. *Depress Anxiety*, *32*(11), 811-820. https://doi.org/10.1002/da.22397	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Nacasch, N., Foa, E. B., Huppert, J. D., Tzur, D., Fostick, L., Dinstein, Y., Polliack, M., & Zohar, J. (2011). Prolonged exposure therapy for combat- and terror-related posttraumatic stress disorder: a randomized control comparison with treatment as usual. *J Clin Psychiatry*, *72*(9), 1174-1180. https://doi.org/10.4088/JCP.09m05682blu	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Nacasch, N., Huppert, J. D., Su, Y. J., Kivity, Y., Dinshtein, Y., Yeh, R., & Foa, E. B. (2015). Are 60-minute prolonged exposure sessions with 20-minute imaginal exposure to traumatic memories sufficient to successfully treat PTSD? A randomized noninferiority clinical trial. *Behav Ther*, *46*(3), 328-341. https://doi.org/10.1016/j.beth.2014.12.002	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms

Citation	Reason for exclusion
Neuner, F., Kurreck, S., Ruf, M., Odenwald, M., Elbert, T., & Schauer, M. (2010). Can asylum-seekers with posttraumatic stress disorder be successfully treated? A randomized controlled pilot study. *Cogn Behav Ther*, *39*(2), 81-91. https://doi.org/10.1080/16506070903121042	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Neuner, F., Onyut, P. L., Ertl, V., Odenwald, M., Schauer, E., & Elbert, T. (2008). Treatment of posttraumatic stress disorder by trained lay counselors in an African refugee settlement: a randomized controlled trial. *J Consult Clin Psychol*, *76*(4), 686-694. https://doi.org/10.1037/0022-006x.76.4.686	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Norman, S. B., Trim, R., Haller, M., Davis, B. C., Myers, U. S., Colvonen, P. J., Blanes, E., Lyons, R., Siegel, E. Y., Angkaw, A. C., Norman, G. J., & Mayes, T. (2019). Efficacy of Integrated Exposure Therapy vs Integrated Coping Skills Therapy for Comorbid Posttraumatic Stress Disorder and Alcohol Use Disorder: A Randomized Clinical Trial. *JAMA Psychiatry*, *76*(8), 791-799. https://doi.org/10.1001/jamapsychiatry.2019.0638	No full PTSD-diagnosis required for inclusion
Oprel, D. A. C., Hoeboer, C. M., Schoorl, M., de Kleine, R. A., Cloitre, M., Wigard, I. G., van Minnen, A., & van der Does, W. (2021). Effect of Prolonged Exposure, intensified Prolonged Exposure and STAIR+Prolonged Exposure in patients with PTSD related to childhood abuse: a randomized controlled trial. *European Journal of Psychotraumatology*, *12*(1), 1851511-1851511. https://doi.org/https://dx.doi.org/10.1080/20008198.2020.1851511	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Orang, T., Ayoughi, S., Moran, J. K., Ghaffari, H., Mostafavi, S., Rasoulian, M., & Elbert, T. (2018). The efficacy of narrative exposure therapy in a sample of Iranian women exposed to ongoing intimate partner violence-A randomized controlled trial. *Clin Psychol Psychother*, *25*(6), 827-841. https://doi.org/10.1002/cpp.2318	Post-assessment more than six weeks after the end of treatment
Park, J., Hunt, C., Abirgas, K., Bomyea, J., & Colvonen, P. J. (2023). Veterans who focus on sexual assault trauma show slower between-session habituation and symptom reduction during prolonged exposure treatment for posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0001536	Secondary analyses
Paunovic, N., & Ost, L. G. (2001). Cognitive-behavior therapy vs exposure therapy in the treatment of PTSD in refugees. *Behav Res Ther*, *39*(10), 1183-1197. https://doi.org/10.1016/s0005-7967(00)00093-0	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Perez-Dandieu, B., & Tapia, G. (2014). Treating Trauma in Addiction with EMDR: A Pilot Study. *J Psychoactive Drugs*, *46*(4), 303-309. https://doi.org/10.1080/02791072.2014.921744	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Pigeon, W. R., Crean, H. F., Cerulli, C., Gallegos, A. M., Bishop, T. M., & Heffner, K. L. (2022). A Randomized Clinical Trial of Cognitive-Behavioral Therapy for Insomnia to Augment Posttraumatic Stress Disorder Treatment in Survivors of Interpersonal Violence. *Psychotherapy and Psychosomatics*, *91*(1), 50-62. https://doi.org/https://dx.doi.org/10.1159/000517862	No full PTSD-diagnosis required for inclusion
Polak, A. R., Witteveen, A. B., Denys, D., & Olff, M. (2015). Breathing biofeedback as an adjunct to exposure in cognitive behavioral therapy hastens the reduction of PTSD symptoms: a pilot study. *Appl Psychophysiol Biofeedback*, *40*(1), 25-31. https://doi.org/10.1007/s10484-015-9268-y	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Power, K., McGoldrick, T., Brown, K., Buchanan, R., Sharp, D., Swanson, V., & Karatzias, A. (2002). A controlled comparison of eye movement desensitization and reprocessing versus exposure plus cognitive restructuring versus waiting list in the treatment of post-traumatic stress disorder. *Clinical Psychology & Psychotherapy*, *9*(5), 299-318. https://doi.org/10.1002/cpp.341	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Powers, M. B., Medina, J. L., Burns, S., Kauffman, B. Y., Monfils, M., Asmundson, G. J., Diamond, A., McIntyre, C., & Smits, J. A. (2015). Exercise Augmentation of Exposure Therapy for PTSD: Rationale and Pilot Efficacy Data. *Cogn Behav Ther*, *44*(4), 314-327. https://doi.org/10.1080/16506073.2015.1012740	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Rauch, S. A. M., Kim, H. M., Acierno, R., Ragin, C., Wangelin, B., Blitch, K., Muzzy, W., Hart, S., & Zivin, K. (2023). Improving function through primary care treatment of posttraumatic stress disorder study outcomes: A randomized controlled trial of prolonged exposure for primary care in veterans. *Families, Systems, & Health*. https://doi.org/10.1037/fsh0000823	No clinician-based PTSD-diagnosis based on a structured interview at inclusion

Citation	Reason for exclusion
Resick, P. A., Wachen, J. S., Dondanville, K. A., LoSavio, S. T., Young-McCaughan, S., Yarvis, J. S., Pruiksma, K. E., Blankenship, A., Jacoby, V., Peterson, A. L., & Mintz, J. (2021). Variable-length cognitive processing therapy for posttraumatic stress disorder in active duty military: Outcomes and predictors. *Behaviour Research and Therapy*, *141*. https://doi.org/10.1016/j.brat.2021.103846	Not a randomized controlled trial
Robjant, K., Koebach, A., Schmitt, S., Chibashimba, A., Carleial, S., & Elbert, T. (2019). The treatment of posttraumatic stress symptoms and aggression in female former child soldiers using adapted Narrative Exposure therapy - a RCT in Eastern Democratic Republic of Congo. *Behav Res Ther*, *123*, 103482. https://doi.org/10.1016/j.brat.2019.103482	Post-assessment more than six weeks after the end of treatment
Rothbaum, B. O. (1997). A controlled study of eye movement desensitization and reprocessing in the treatment of posttraumatic stress disordered sexual assault victims. *Bull Menninger Clin*, *61*(3), 317-334.	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Sannibale, C., Teesson, M., Creamer, M., Sitharthan, T., Bryant, R. A., Sutherland, K., Taylor, K., Bostock-Matusko, D., Visser, A., & Peek-O'Leary, M. (2013). Randomized controlled trial of cognitive behaviour therapy for comorbid post-traumatic stress disorder and alcohol use disorders. *Addiction*, *108*(8), 1397-1410. https://doi.org/10.1111/add.12167	No full PTSD-diagnosis required for inclusion
Santarnecchi, E., Bossini, L., Vatti, G., Fagiolini, A., La Porta, P., Di Lorenzo, G., Siracusano, A., Rossi, S., & Rossi, A. (2019). Psychological and Brain Connectivity Changes Following Trauma-Focused CBT and EMDR Treatment in Single-Episode PTSD Patients. *Front Psychol*, *10*, 129. https://doi.org/10.3389/fpsyg.2019.00129	Not a randomized controlled trial
Saraiya, T. C., Badour, C. L., Jones, A. C., Jarnecke, A. M., Brown, D. G., Flanagan, J. C., Killeen, T. K., & Back, S. E. (2022). The role of posttraumatic guilt and anger in integrated treatment for PTSD and co-occurring substance use disorders among primarily male veterans. *Psychological Trauma: Theory, Research, Practice, and Policy*. https://doi.org/10.1037/tra0001204	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Saul, H., Cassidy, S., Deeney, B., Kwint, J., & Bisson, J. (2023). Online cognitive behavioural therapy for post-traumatic stress disorder is as effective as face-to-face therapy. *BMJ (Clinical research ed.)*, *380*, 266-266. https://doi.org/https://dx.doi.org/10.1136/bmj.p266	Not a randomized controlled trial
Schulz-Heik, R. J., Avery, T. J., Jo, B., Mahoney, L., & Bayley, P. J. (2022). Posttraumatic Stress Disorder Does Not Compromise Behavioral Pain Treatment: Secondary Analysis of a Randomized Clinical Trial Among Veterans. *Global Advances in Health and Medicine*, *11*. https://doi.org/https://doi.org/10.1177/21649561221075578	Secondary analyses
Schulz-Heik, R. J., Lazzeroni, L. C., Hernandez, B., Avery, T. J., Mathersul, D. C., Tang, J. S., Hugo, E., & Bayley, P. J. (2022). Valued living among veterans in breath-based meditation treatment or cognitive processing therapy for posttraumatic stress disorder: exploratory outcome of a randomized controlled trial. *Global Advances in Health and Medicine*, *11*. https://doi.org/https://dx.doi.org/10.1177/2164957X221108376	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Shapiro, E., & Laub, B. (2015). Early EMDR intervention following a community critical incident: A randomized clinical trial. *Journal of EMDR Practice and Research*, *9*(1), 17-27. https://doi.org/10.1891/1933-3196.9.1.17	No full PTSD-diagnosis required for inclusion
Shemesh, E., Annunziato, R. A., Weatherley, B. D., Cotter, G., Feaganes, J. R., Santra, M., Yehuda, R., & Rubinstein, D. (2011). A randomized controlled trial of the safety and promise of cognitive-behavioral therapy using imaginal exposure in patients with posttraumatic stress disorder resulting from cardiovascular illness. *J Clin Psychiatry*, *72*(2), 168-174. https://doi.org/10.4088/JCP.09m05116blu	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Simpson, T. L., Kaysen, D. L., Fleming, C. B., Rhew, I. C., Jaffe, A. E., Desai, S., Hien, D. A., Berliner, L., Donovan, D., & Resick, P. A. (2022). Cognitive Processing Therapy or Relapse Prevention for comorbid Posttraumatic Stress Disorder and Alcohol Use Disorder: A randomized clinical trial. *PLoS ONE*, *17*(11), e0276111-e0276111. https://doi.org/https://dx.doi.org/10.1371/journal.pone.0276111	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Sjomark, J., Svanberg, A., Viirman, F., Larsson, M., Poromaa, I., Skalkidou, A., Jonsson, M., & Parling, T. (2022). Antepartum and labour-related single predictors of non-participation, dropout and lost to follow up in a randomised controlled trial comparing internet-based cognitive-behaviour therapy with treatment as usual for women with negative birth experiences and. *BMJ Open*, *12*(11), e063214-e063214. https://doi.org/https://dx.doi.org/10.1136/bmjopen-2022-063214	Secondary analyses

Citation	Reason for exclusion
Sjomark, J., Svanberg, A. S., Larsson, M., Viirman, F., Poromaa, I. S., Skalkidou, A., Jonsson, M., & Parling, T. (2022). Effect of internet-based cognitive behaviour therapy among women with negative birth experiences on mental health and quality of life - a randomized controlled trial. *BMC pregnancy and childbirth*, *22*(1), 835-835. https://doi.org/https://dx.doi.org/10.1186/s12884-022-05168-y	No full PTSD-diagnosis required for inclusion
Sloan, D. M., Marx, B. P., Acierno, R., Messina, M., & Cole, T. A. (2021). Comparing written exposure therapy to Prolonged Exposure for the treatment of PTSD in a veteran sample: A non-inferiority randomized design. *Contemporary Clinical Trials Communications*, *22*, 100764-100764. https://doi.org/https://dx.doi.org/10.1016/j.conctc.2021.100764	Not a randomized controlled trial
Sloan, D. M., Marx, B. P., Resick, P. A., Young-McCaughan, S., Dondanville, K. A., Straud, C. L., Mintz, J., Litz, B. T., & Peterson, A. L. (2022). Effect of Written Exposure Therapy vs Cognitive Processing Therapy on Increasing Treatment Efficiency Among Military Service Members With Posttraumatic Stress Disorder: A Randomized Noninferiority Trial. *JAMA network open*, *5*(1), e2140911-e2140911. https://doi.org/https://dx.doi.org/10.1001/jamanetworkopen.2021.40911	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Sloan, D. M., Thompson-Hollands, J., Hayes, A. M., Lee, D. J., Alpert, E., & Marx, B. P. (2022). Sudden Gains in Two Trauma-Focused Treatments for Posttraumatic Stress Disorder. *Behavior therapy*, *53*(2), 255-266. https://doi.org/https://dx.doi.org/10.1016/j.beth.2021.08.003	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Splaine, C., Smith, D. L., & Held, P. (2023). The role of time since trauma on treatment outcomes of veterans in two intensive posttraumatic stress disorder treatment programs. *Journal of Traumatic Stress*, *36*(1), 83-93. https://doi.org/https://dx.doi.org/10.1002/jts.22881	Not a randomized controlled trial
Stecker, T., McHugo, G., Xie, H., Whyman, K., & Jones, M. (2014). RCT of a brief phone-based CBT intervention to improve PTSD treatment utilization by returning service members. *Psychiatr Serv*, *65*(10), 1232-1237. https://doi.org/10.1176/appi.ps.201300433	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Steuwe, C., Berg, M., Beblo, T., & Driessen, M. (2021). Narrative Exposure Therapy in Patients With Posttraumatic Stress Disorder and Borderline Personality Disorder in a Naturalistic Residential Setting: A Randomized Controlled Trial. *Frontiers in Psychiatry*, *12*, 765348-765348. https://doi.org/https://doi.org/10.3389/fpsyt.2021.765348	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Stirman, S. W., Cohen, Z. D., Lunney, C. A., DeRubeis, R. J., Wiley, J. F., & Schnurr, P. P. (2021). A personalized index to inform selection of a trauma-focused or non-trauma-focused treatment for PTSD. *Behaviour Research and Therapy*, *142*. https://doi.org/10.1016/j.brat.2021.103872	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Sullan, M. J., Crocker, L. D., Thomas, K. R., Orff, H. J., Davey, D. K., Jurick, S. M., Twamley, E. W., Norman, S. B., Schiehser, D. M., Aupperle, R., & Jak, A. J. (2021). Baseline sleep quality moderates symptom improvement in veterans with comorbid PTSD and TBI receiving trauma-focused treatment. *Behaviour Research and Therapy*, *143*, 103892-103892. https://doi.org/https://dx.doi.org/10.1016/j.brat.2021.103892	Secondary analyses
Surís, A., Link-Malcolm, J., Chard, K., Ahn, C., & North, C. (2013). A randomized clinical trial of cognitive processing therapy for veterans with PTSD related to military sexual trauma. *J Trauma Stress*, *26*(1), 28-37. https://doi.org/10.1002/jts.21765	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Susanty, E., Sijbrandij, M., Srisayekti, W., Suparman, Y., & Huizink, A. C. (2022). The Effectiveness of Eye Movement Desensitization for Post-traumatic Stress Disorder in Indonesia: A Randomized Controlled Trial. *Front Psychol*, *13*, 845520. https://doi.org/10.3389/fpsyg.2022.845520	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Tarrier, N., Pilgrim, H., Sommerfield, C., Faragher, B., Reynolds, M., Graham, E., & Barrowclough, C. (1999). A randomized trial of cognitive therapy and imaginal exposure in the treatment of chronic posttraumatic stress disorder. *J Consult Clin Psychol*, *67*(1), 13-18. https://doi.org/10.1037//0022-006x.67.1.13	Did not apply DSM-IV, DSM-5, or ICD-10 criteria for PTSD
Thorisdottir, A. S., & Asmundson, G. (2022). Internet-delivered cognitive processing therapy for individuals with a history of bullying victimization: a randomized controlled trial. *Cognitive behaviour therapy*, *51*(2), 143-169. https://doi.org/https://dx.doi.org/10.1080/16506073.2021.1938663	No full PTSD-diagnosis required for inclusion

Citation	Reason for exclusion
Thorp, S. R., Glassman, L. H., Wells, S. Y., Walter, K. H., Gebhardt, H., Twamley, E., Golshan, S., Pittman, J., Penski, K., Allard, C., Morland, L. A., & Wetherell, J. (2019). A randomized controlled trial of prolonged exposure therapy versus relaxation training for older veterans with military-related PTSD. *J Anxiety Disord*, *64*, 45-54. https://doi.org/10.1016/j.janxdis.2019.02.003	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
van Denderen, M., de Keijser, J., Stewart, R., & Boelen, P. A. (2018). Treating complicated grief and posttraumatic stress in homicidally bereaved individuals: A randomized controlled trial. *Clin Psychol Psychother*, *26*(25), 497-508. https://doi.org/10.1002/cpp.2183	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Vera, M., Oben, A., Juarbe, D., Hernandez, N., Kichic, R., & Hembree, E. A. (2022). A randomized clinical trial of prolonged exposure and applied relaxation for the treatment of Latinos with posttraumatic stress disorder. *Journal of Traumatic Stress*, *35*(2), 593-604. https://doi.org/https://dx.doi.org/10.1002/jts.22773	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Walters, E. M., Jenkins, M. M., Nappi, C. M., Clark, J., Lies, J., Norman, S. B., & Drummond, S. P. A. (2020). The impact of prolonged exposure on sleep and enhancing treatment outcomes with evidence-based sleep interventions: A pilot study. *Psychol Trauma*, *12*(2), 175-185. https://doi.org/10.1037/tra0000478	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Watkins, L. L., LoSavio, S. T., Calhoun, P., Resick, P. A., Sherwood, A., Coffman, C. J., Kirby, A. C., Beaver, T. A., Dennis, M. F., & Beckham, J. C. (2023). Effect of cognitive processing therapy on markers of cardiovascular risk in posttraumatic stress disorder patients: A randomized clinical trial. *Journal of Psychosomatic Research*, *170*, 111351. https://doi.org/https://dx.doi.org/10.1016/j.jpsychores.2023.111351	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Wells, S. Y., Walter, K. H., Dedert, E. A., Strasshofer, D. R., Schnitzer, J. S., Thorp, S. R., Morland, L. A., & Glassman, L. H. (2022). Do older veterans experience change in posttraumatic cognitions following treatment for posttraumatic stress disorder? *Psychological trauma : theory, research, practice and policy*, *14*(4), 605-614. https://doi.org/https://dx.doi.org/10.1037/tra0001119	Secondary analyses
Wheaton, M. G., Choo, T.-H., & Markowitz, J. C. (2023). Changes in avoidance and distress related to trauma reminders in PTSD psychotherapy. *Journal of Behavior Therapy and Experimental Psychiatry*, *78*, 101805-101805. https://doi.org/https://dx.doi.org/10.1016/j.jbtep.2022.101805	Secondary analyses
Yurtsever, A., Konuk, E., Akyüz, T., Zat, Z., Tükel, F., Çetinkaya, M., Savran, C., & Shapiro, E. (2018). An Eye Movement Desensitization and Reprocessing (EMDR) Group Intervention for Syrian Refugees With Post-traumatic Stress Symptoms: Results of a Randomized Controlled Trial. *Front Psychol*, *9*, 493. https://doi.org/10.3389/fpsyg.2018.00493	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Zaccari, B., Loftis, J., Haywood, T., Hubbard, K., Clark, J., & Kelly, U. (2022). Synchronous telehealth yoga and cognitive processing group therapies for women veterans with posttraumatic stress disorder: a multisite randomized controlled trial adapted for COVID-19. *Telemedicine Journal and e-Health*. https://doi.org/https://doi.org/10.1089/tmj.2021.0612	Not a randomized controlled trial
Zang, Y., Hunt, N., & Cox, T. (2013). A randomised controlled pilot study: the effectiveness of narrative exposure therapy with adult survivors of the Sichuan earthquake. *BMC Psychiatry*, *13*, 41. https://doi.org/10.1186/1471-244x-13-41	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Zang, Y., Hunt, N., & Cox, T. (2014). Adapting narrative exposure therapy for Chinese earthquake survivors: a pilot randomised controlled feasibility study. *BMC Psychiatry*, *14*, 262. https://doi.org/10.1186/s12888-014-0262-3	No clinician-based PTSD-diagnosis based on a structured interview at inclusion
Zemestani, M., Mohammed, A. F., Ismail, A. A., & Vujanovic, A. A. (2022). A Pilot Randomized Clinical Trial of a Novel, Culturally Adapted, Trauma-Focused Cognitive-Behavioral Intervention for War-Related PTSD in Iraqi Women. *Behavior therapy*, *53*(4), 656-672. https://doi.org/https://dx.doi.org/10.1016/j.beth.2022.01.009	No dichotomous clinician-rated or self-reported response outcome related to change in PTSD symptoms
Zhao, J., Chen, D.-Y., Li, X.-B., Xi, Y.-J., Verma, S., Zhou, F.-C., & Wang, C.-Y. (2023). EMDR versus waiting list in individuals at clinical high risk for psychosis with post-traumatic stress symptoms: A randomized controlled trial. *Schizophrenia research*, *256*, 1-7. https://doi.org/https://dx.doi.org/10.1016/j.schres.2023.04.003	No full PTSD-diagnosis required for inclusion
Ziemba, S. J., Bradley, N. S., Landry, L. A., Roth, C. H., Porter, L. S., & Cuyler, R. N. (2014). Posttraumatic stress disorder treatment for Operation Enduring Freedom/Operation Iraqi Freedom combat veterans through a civilian community-based telemedicine network. *Telemed J E Health*, *20*(5), 446-450. https://doi.org/10.1089/tmj.2013.0312	Data do not allow conclusions on the number of non-responders per experimental and control group

PTSD = posttraumatic stress disorder; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, fourth edition; DSM-5 = Diagnostic and Statistical Manual of Mental Disorders, fifth edition; ICD-10 = International Classification of Diseases, 10th revision.

C7. Full Table of included studies and variables

Table C7.1. Overview of Included Studies

Study Treatment arm(s)	N total	Non-response Int n / N (%)	Non-response CG n / N (%)	Operationalization of non-response	Non-response assessment tool	Control group	Country of implementation
Acarturk et al. (2016)	98		46/49 (93.88)			Waiting list	Turkey
EMDR		19/49 (38.78)		Retaining diagnosis	M.I.N.I. PLUS		
Adenauer et al. (2011)	19		8/8 (100.00)			Waiting list	Germany
NET		6/11 (54.55)		Retaining diagnosis	CAPS		
Allen et al. (2022)	30		14/17 (82.35)			Waiting list	Australia
CBT		5/13 (38.46)		Retaining diagnosis	PCL-C		
Back et al. (2019)	42		8/13 (61.54)			Active control	USA
PE		5/29 (17.24)		Retaining diagnosis	CAPS		
Beck et al. (2009)	33		11/16 (68.75)			Waiting list	USA
CBT		2/17 (11.76)		Retaining diagnosis	CAPS		
Belleville et al. (2018)	31		4/15 (26.67)			Active control	Canada
CBT		2/16 (12.50)		Retaining diagnosis	CAPS		
Bisson et al. (2022)	160		14/77 (18.18)			Active control	England
CBT		12/83 (14.46)		Retaining diagnosis	CAPS-5		
Blanchard et al. (2003)	42		16/21 (76.19)			Waiting list	USA
CBT		5/21 (23.81)		Retaining diagnosis	CAPS		
Bohus et al. (2013)	74		37/38 (97.37)			TAU	Germany
CBT		22/36 (61.11)		Symptom reduction not achieved	CAPS		
Brady et al. (2021)	19		-/7 (-)		CAPS-5	Waiting list	England
NET		6/12 (50.00)		Symptom reduction not achieved			
Bryant et al. (2003)	45		9/15 (60.00)			Active control	Australia
PE		5/15 (33.33)		Retaining diagnosis	CAPS		
PE + CT		2/15 (13.33)		Retaining diagnosis	CAPS		
Bryant et al. (2008)	90						Australia
CBT		5/24 (20.83)		Retaining diagnosis	CAPS		
CBT		10/21 (47.62)		Retaining diagnosis	CAPS		
CBT		12/22 (54.55)		Retaining diagnosis	CAPS		
CBT		12/23 (52.17)		Retaining diagnosis	CAPS		
Bryant et al. (2011)	28		8/12 (66.67)			TAU	Thailand
CBT		4/16 (25.00)		Cut-off score not achieved	CAPS		
Bryant et al. (2013)	70						Australia
CBT		9/34 (26.47)		Retaining diagnosis	CAPS		
CBT		7/36 (19.44)		Retaining diagnosis	CAPS		
Bryant et al. (2019)	84		25/28 (89.29)			Waiting list	Australia
CBT		11/27 (40.74)		Retaining diagnosis	CAPS		
CBT		7/29 (24.14)		Retaining diagnosis	CAPS		
Butollo et al. (2016)	141		35/74 (47.30)			Active control	Germany
CPT		26/67 (38.81)		Retaining diagnosis	PDS		
Castillo et al. (2016)	28		-/14 (-)			Waiting list	USA
CBT		7/14 (50.00)		Retaining diagnosis	CAPS		
Chard (2005)	55		20/27 (74.07)			Waiting list	USA
CPT		2/28 (7.14)		Retaining diagnosis	CAPS		
Cloitre et al. (2002)	46		18/24 (75.00)			Waiting list	USA
PE		5/22 (22.73)		Retaining diagnosis	CAPS		

Study Treatment arm(s)	N total	Non-response Int n / N (%)	Non-response CG n / N (%)	Operationalization of non-response	Non-response assessment tool	Control group	Country of implementation
Cloitre et al. (2010)	104		20/38 (52.63)			Active control	USA
PE		22/33 (66.67)		Retaining diagnosis	CAPS		
PE		13/33 (39.39)		Retaining diagnosis	CAPS		
Dell et al. (2022)	105						Australia
PE		23/51 (45.90)		Retaining diagnosis	CAPS-5		
PE		29/54 (53.30)		Retaining diagnosis	CAPS-5		
Dunne et al. (2012)	26		12/13 (92.31)			Waiting list	Australia
CBT		5/13 (38.46)		Retaining diagnosis	SCID		
Ehlers et al. (2003)	55		19/27 (70.37)			Waiting list	England
CT		6/28 (21.43)		Retaining diagnosis	CAPS		
Ehlers et al. (2005)	28		14/14 (100.00)			Waiting list	England
CT		4/14 (28.60)		Retaining diagnosis	CAPS		
Ehlers et al. (2014)	91		28/30 (93.33)			Waiting list	England
CT		7/31 (22.58)		Retaining diagnosis	CAPS		
CT		8/30 (26.67)		Retaining diagnosis	CAPS		
Ehlers et al. (2023)	185		29/93 (31.00)			Active control	England
CT		15/92 (16.00)		Retaining diagnosis	CAPS-5		
Falsetti et al. (2008)	47		17/23 (73.91)			Waiting list	USA
CBT		3/24 (12.50)		Retaining diagnosis	CAPS		
Fecteau & Nicki (1999)	20		10/10 (100.00)			Waiting list	Canada
CBT		5/10 (50.00)		Retaining diagnosis	CAPS		
Feske (2008)	21		9/12 (75.00)			TAU	USA
PE		3/9 (33.33)		Non-significant change per formula	PDS		
Foa et al. (2018)	259		32/40 (80.00)			Waiting list	USA
PE		56/109 (51.38)		Retaining diagnosis	PSS-I		
PE		60/110 (54.55)		Retaining diagnosis	PSS-I		
Forbes et al. (2012)	47		20/23 (86.96)			TAU	Australia
CPT		15/24 (62.50)		Retaining diagnosis	CAPS		
Ford et al. (2018)	16		5/11 (45.45)			Active control	USA
PE		2/5 (40.00)		Retaining diagnosis	CAPS		
Franklin et al. (2017)	13		5/7 (71.43)			TAU	USA
PE		0/3 (0.00)		Retaining diagnosis	CAPS		
PE		2/3 (66.67)		Retaining diagnosis	CAPS		
Hensel-Dittmann et al. (2011)	23		10/10 (100.00)			Active control	Germany
NET		11/13 (84.62)		Retaining diagnosis	CAPS		
Hinton et al. (2011)	24		8/12 (66.67)			Active control	USA
CBT		0/12 (0.00)		Symptom reduction not achieved	PCL		
Högberg et al. (2007)	21		8/9 (88.89)			Waiting list	Norway
EMDR		4/12 (33.33)		Retaining diagnosis	SCID		
Hollifield et al. (2007)	42		17/21 (80.95)			Waiting list	USA
CBT		12/21 (57.14)		Cut-off score not achieved	PSS-SR		
Karatzias et al. (2011)	46		14/23 (60.87)			Active control	Scotland
EMDR		13/23 (56.52)		Cut-off score not achieved	CAPS		
Kubany et al. (2004)	86		-/40 (-)			Waiting list	USA
CT		4/46 (8.70)		Retaining diagnosis	CAPS		
Langkaas et al. (2017)	65						Norway
CBT		11/34 (32.35)		Non-significant change per formula	PSS-I		
PE		31/10 (32.26)		Non-significant change per formula	PSS-I		
Lely et al. (2019)	26		10/12 (83.33)			Active control	Netherlands
NET		12/14 (85.71)		Retaining diagnosis	CAPS		

Study Treatment arm(s)	N total	Non-response Int n / N (%)	Non-response CG n / N (%)	Operationalization of non-response	Non-response assessment tool	Control group	Country of implementation
Lindauer et al. (2005)	24		9/12 (75.00)			Waiting list	Netherlands
BEP		2/12 (16.67)		Retaining diagnosis	SI-PTSD		
Markowitz et al. (2015)	70		20/32 (62.50)			Active control	USA
PE		20/38 (52.63)		Symptom reduction not achieved	CAPS		
Maxwell et al. (2016)	16		1/8 (12.50)			Active control	USA
CPT		1/8 (12.50)		Symptom reduction not achieved	MPSS-SR		
McDonagh et al. (2005)	37		16/20 (80.00)			Waiting list	USA
CBT		9/17 (52.94)		Retaining diagnosis	CAPS		
McGovern et al. (2011)	23		5/10 (50.00)			Active control	USA
CBT		4/13 (30.77)		Retaining diagnosis	CAPS		
McLay et al. (2017)	85		29/42 (69.05)			Active control	USA
PE		27/43 (62.79)		Symptom reduction not achieved	CAPS		
Monson et al. (2006)	63		32/33 (96.97)			Waiting list	USA
CPT		18/30 (60.00)		Retaining diagnosis	CAPS		
Morland et al. (2019)	175						USA
PE		26/58 (44.83)		Retaining diagnosis	CAPS		
PE		26/58 (44.83)		Retaining diagnosis	CAPS		
PE		22/59 (37.29)		Retaining diagnosis	CAPS		
Mueser et al. (2008)	58		21/27 (77.78)			TAU	USA
CBT		21/31 (67.74)		Retaining diagnosis	CAPS		
Mueser et al. (2015)	161		55/75 (73.33)			Active control	USA
CBT		55/86 (63.95)		Retaining diagnosis	CAPS		
Nidich et al. (2018)	134		45/66 (68.18)			Active control	USA
PE		40/68 (58.82)		Symptom reduction not achieved	CAPS		
Nijdam et al. (2012)	93						Netherlands
BEP		6/42 (14.29)		Retaining diagnosis	SI-PTSD		
EMDR		4/51 (7.84)		Retaining diagnosis	SI-PTSD		
Peck et al. (2023)	30		4/10 (40.00)			TAU	USA
PE		6/10 (60.00)		Retaining diagnosis	CAPS-5		
PE		6/10 (60.00)		Retaining diagnosis	CAPS-5		
Peterson et al. (2022)	120						USA
CPT		18/44 (42.00)		Retaining diagnosis	CAPS-5		
CPT		12/32 (38.00)		Retaining diagnosis	CAPS-5		
CPT		23/44 (52.00)		Retaining diagnosis	CAPS-5		
Peterson et al. (2023)	234						USA
PE		44/117 (38.00)		Retaining diagnosis	CAPS-5		
PE		61/117 (52.00)		Retaining diagnosis	CAPS-5		
Popiel et al. (2015)	140		17/30 (56.67)			Active control	Poland
PE		38/110 (34.55)		Retaining diagnosis	SCID		
Rauch et al. (2015)	26		6/15 (40.00)			Active control	USA
PE		1/11 (9.09)		Symptom reduction not achieved	CAPS		
Ready et al. (2018)	81		23/40 (57.50)			Active control	USA
CBT		23/41 (56.10)		Non-significant change per formula	CAPS		
Reger et al. (2016)	79		37/47 (78.72)			Waiting list	USA
PE		11/32 (34.38)		Non-significant change per formula	CAPS		
Resick et al. (2002)	121		-/40 (-)			Waiting list	USA
CPT		8/41 (19.51)		Retaining diagnosis	CAPS		
PE		7/40 (17.50)		Retaining diagnosis	CAPS		

Study Treatment arm(s)	N total	Non-response Int n / N (%)	Non-response CG n / N (%)	Operationalization of non-response	Non-response assessment tool	Control group	Country of implementation
Resick et al. (2008)	86		11/30 (36.67)			Active control	USA
CPT		8/27 (29.63)		Retaining diagnosis	CAPS		
CT		6/29 (20.69)		Retaining diagnosis	CAPS	CT	
Resick et al. (2015)	108		34/52 (65.38)			Active control	USA
CPT		29/56 (51.79)		Symptom reduction not achieved	PCL		
Resick et al. (2017)	165						USA
CPT		43/83 (51.81)		Retaining diagnosis	PSS-I		
CPT		50/82 (60.98)		Retaining diagnosis	PSS-I		
Rothbaum et al. (2005)	60		18/20 (90.00)			Waiting list	USA
EMDR		5/20 (25.00)		Retaining diagnosis	CAPS		
PE		1/20 (5.00)		Retaining diagnosis	CAPS		
Sack et al. (2016)	92		9/45 (20.00)			Active control	Germany
EMDR		9/47 (19.15)		Retaining diagnosis	SCID		
Schacht et al. (2017)	50						USA
PE		14/27 (51.85)		Symptom reduction not achieved	CAPS		
PE		5/23 (21.74)		Symptom reduction not achieved	CAPS		
Schnurr et al. (2003)	325		102/163 (62.58)			Active control	USA
CBT		99/162 (61.11)		Symptom reduction not achieved	CAPS		
Schnurr et al. (2007)	194		89/111 (80.18)			Active control	USA
PE		44/83 (53.01)		Retaining diagnosis	CAPS		
Schnurr et al. (2022)	916						USA
PE		271/455 (59.60)		Retaining diagnosis	CAPS-5		
CPT		331/461 (71.80)		Retaining diagnosis	CAPS-5		
Sloan, Marx, et al. (2018)	114		44/62 (70.97)			Active control	USA
CPT		26/52(50.00)		Retaining diagnosis	CAPS		
Sloan, Unger, et al. (2018)	198		77/100 (77.00)			Active control	USA
CBT		69/98 (70.41)		Retaining diagnosis	CAPS		
Stenmark et al. (2013)	54		14/21 (66.67)			TAU	Norway
NET		19/33 (57.58)		Retaining diagnosis	CAPS		
Taylor et al. (2003)	45		9/15 (60.00)			Active control	Canada
EMDR		6/15 (40.00)		Retaining diagnosis	CAPS		
PE		2/15 (13.33)		Retaining diagnosis	CAPS		
Taylor et al. (2023)	93						USA
CPT		15/31 (48.40)		Non-significant change per formula	PCL		
CPT		15/31 (48.40)		Non-significant change per formula	PCL		
CPT		18/31 (58.10)		Non-significant change per formula	PCL		
Ter Heide et al. (2016)	62		20/29 (68.97)			Active control	Netherlands
EMDR		21/33 (63.64)		Retaining diagnosis	CAPS		
Thompson-Hollands et al. (2023)	257		69/129 (53.50)			Active control	USA
PE		50/128 (39.10)		Non-significant change per formula	PCL		
Trottier et al. (2022)			17/18 (94.40)			Active control	Canada
CBT		7/16 (43.70)		Retaining diagnosis	CAPS-5		
Van den Berg et al. (2015)	155		26/47 (55.32)			Waiting list	Netherlands
EMDR		11/55 (20.00)		Retaining diagnosis	CAPS		
PE		17/53 (32.08)		Retaining diagnosis	CAPS		
Van der Kolk et al. (2007)	50		9/26 (34.62)			Waiting list	USA
EMDR		3/24 (12.50)		Retaining diagnosis	CAPS		
Van Vliet et al. (2021)	121						Netherlands
EMDR		21/64 (33.30)		Retaining diagnosis	CAPS-5		
EMDR		17/57 (31.10)		Retaining diagnosis	CAPS-5		

Study Treatment arm(s)	N total	Non-response Int n / N (%)	Non-response CG n / N (%)	Operationalization of non-response	Non-response assessment tool	Control group	Country of implementation
Vera et al. (2011)	12		7/7 (100.00)			TAU	Puerto Rico
PE		3/5 (60.00)		Retaining diagnosis	CAPS		
Wells et al. (2015)	20		-/10 (-)			Waiting list	England
PE		3/10 (30.00)		Retaining diagnosis	SCID		
Yehuda et al. (2014)	37		10/12 (83.33)			Waiting list	USA
PE		14/25 (56.00)		Retaining diagnosis	CAPS		
Yuen et al. (2015)	52						USA
PE		9/29 (31.03)		Retaining diagnosis	CAPS		
PE		6/23 (26.09)		Retaining diagnosis	CAPS		
Zaccari et al. (2022)	19		5/9 (55.60)			Active Control	USA
CPT		8/10 (80.0)		Retaining diagnosis	CAPS		

(table continues with further variables)

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Study Treatment arm(s)	Overall bias	Type of Analysis	Population	M age	% female	% in committed relationship	% employed	% with college level education	M (z) PTSD severity
Acarturk et al. (2016)	Some concerns	ITT							
EMDR			Refugees	33.3	79.2	71.1	-	4.3	-
Adenauer et al. (2011)	High	PP							
NET			Refugees	30.3	43.8	-	-	-	88.00 (1.75) [1]
Allen et al. (2022)	High	ITT							
CBT			Civil	-	-	-	-	-	59.29 (0.03) [3]
Back et al. (2019)	High	PP							
PE			Veterans & Military	39.7	7.4	25.9	41.5	-	77.40 (0.43) [1]
Beck et al. (2009)	High	PP							
CBT			Civil	-	-	-	-	-	57.30 (-2.07) [1]
Belleville et al. (2018)	Some concerns	PP							
CBT			Civil	31.5	90.0	20.0	85.0	75.0	-
Bisson et al. (2022)	Low	ITT							
CBT			Civil	37.6	63.6	-	-	37.4	35.60 (-1.52) [4]
Blanchard et al. (2003)	High	PP							
CBT			Civil	-	-	-	-	-	-
Bohus et al. (2013)	Some concerns	ITT							
CBT			Civil	35.1	100.0	-	-	-	87.92 (1.74) [1]
Brady et al. (2021)	High	PP							
NET			Civil	26.73	73.3	-	-	-	42.0 (0.99) [4]
Bryant et al. (2003)	Some concerns	PP							
PE			Civil	37.1	-	-	-	-	67.47 (-0.80) [1]
PE + CT			Civil	32.4	-	-	-	-	68.73 (-0.65) [1]
Bryant et al. (2008)	High	PP							
CBT			Civil	33.7	-	-	89.3	-	71.35 (-0.32) [1]
CBT			Civil	35.9	-	-	83.9	-	76.06 (0.95) [1]
CBT			Civil	40.9	-	-	85.7	-	76.79 (NaN) [1]
CBT			Civil	39.1	-	-	77.4	-	73.29 (NaN) [1]
Bryant et al. (2011)	Some concerns	PP							
CBT			Civil	42.3	100.0	13.00	93.0	-	26.80 (-0.21) [2]
Bryant et al. (2013)	High	ITT							
CBT			Civil	41.2	50.0	-	76.0	-	67.69 (-0.78) [1]
CBT			Civil	37.9	58.0	-	77.0	-	73.75 (0.44) [1]
Bryant et al. (2019)	Low	ITT							
CBT			Civil	44.7	12.1	75.8	-	-	80.40 (0.81) [1]
CBT			Civil	42.8	27.3	66.7	-	-	70.50 (-0.27) [1]
Butollo et al. (2016)	High	ITT							
CPT			Civil	33.7	67.2	-	-	-	-
Castillo et al. (2016)	Some concerns	ITT							
CBT			Veterans	36.7	100.0	-	-	-	70.60 (-0.41) [1]
Chard (2005)	Some concerns	PP							
CPT			Civil	-	100.0	-	-	-	65.46 (-1.05) [1]
Cloitre et al. (2002)	Some concerns	PP							
PE			Civil	-	100.0	-	-	-	69.00 (-0.61) [1]
Cloitre et al. (2010)	High	ITT							
PE			Civil	-	100.0	30.0	-	-	64.50 (-1.74) [1]
PE			Civil	-	100.0	39.0	-	-	63.08 (-1.88) [1]

Study Treatment arm(s)	Overall bias	Type of Analysis	Population	M age	% female	% in committed relationship	% employed	% with college level education	M (z) PTSD severity
Dell et al. (2022)	High	ITT							
PE			Veterans & Military	46.7	12.7	-	33.8	27.1	-
PE			Veterans & Military	44.3	11.1	-	33.3	21.0	-
Dunne et al. (2012)	High	ITT							
CBT			Civil	-	-	-	-	-	-
Ehlers et al. (2003)	Some concerns	PP							
CT			Civil	-	-	-	-	-	-
Ehlers et al. (2005)	High	ITT							
CT			Civil	35.4	57.0	64.0	64.0	21.0	-
Ehlers et al. (2014)	High	ITT							
CT			Civil	41.5	58.1	54.8	58.1	25.8	70.60 (-0.41) [1]
CT			Civil	39.7	60.0	60.0	46.7	20.0	78.72 (1.52) [1]
Ehlers et al. (2023)	Low	ITT							
CT			Civil	36.3	74.0	52.0	84.0	40.0	40.20 (0.28) [4]
Falsetti et al. (2008)	High	PP							
CBT			Civil	-	-	-	-	-	-
Fecteau & Nicki (1999)	High	ITT							
CBT			Civil	-	-	-	-	-	70.90 (-0.38) [1]
Feske (2008)	High	PP							
PE			Civil	-	100.0	-	-	-	-
Foa et al. (2018)	Some concerns	ITT							
PE			Veterans & Military	32.9	9.2	74.3	-	65.1	25.31 (-0.51) [2]
PE			Veterans & Military	32.7	14.5	69.1	-	76.3	25.20 (-0.49) [2]
Forbes et al. (2012)	High	PP							
CPT			Veterans & Military	53.1	7.0	62.0	38.0	-	75.53 (0.20) [1]
Ford et al. (2018)	High	PP							
PE			Veterans & Military	-	0.0	-	-	-	72.43 (-0.19) [1]
Franklin et al. (2017)	High	PP							
PE			Veterans & Military	-	-	-	-	-	74.30 (0.05) [1]
PE			Veterans & Military	-	-	-	-	-	69.70 (-0.44) [1]
Hensel-Dittmann et al. (2011)	Some concerns	ITT							
NET			Refugees	-	-	-	-	-	96.47 (2.81) [1]
Hinton et al. (2011)	High	PP							
CBT			Civil	47.6	100.0	-	-	-	69.80 (1.20) [3]
Högberg et al. (2007)	High	PP							
EMDR			Civil	43.0	23.1	61.5	-	-	-
Hollifield et al. (2007)	High	PP							
CBT			Civil	40.9	78.6	25.0	-	71.4	-
Karatzias et al. (2011)	Some concerns	ITT							
EMDR			Civil	41.5	60.9	43.5	65.2	45.5	70.70 (-0.40) [1]
Kubany et al. (2004)	High	PP							
CT			Civil	-	100.0	-	-	-	74.40 (0.06) [1]
Langkaas et al. (2017)	Low	ITT							
CBT			Civil	-	-	-	-	-	33.20 (1.15) [2]
PE			Civil	-	-	-	-	-	34.90 (1.46) [2]
Lely et al. (2019)	Some concerns	PP							
NET			Civil	62.7	27.8	61.1	11.8	-	71.25 (-0.33) [1]
Lindauer et al. (2005)	High	ITT							
BEP			Civil	37.6	41.7	58.3	-	-	-

Study Treatment arm(s)	Overall bias	Type of Analysis	Population	M age	% female	% in committed relationship	% employed	% with college level education	M (z) PTSD severity
Markowitz et al. (2015)	Some concerns	ITT							
PE			Civil	41.8	55.0	13.0	61.0	-	72.10 (-0.23) [1]
Maxwell et al. (2016)	Some concerns	PP							
CPT			Civil	-	-	0.0	-	-	-
McDonagh et al. (2005)	High	PP							
CBT			Civil	39.8	100.0	59.0	76.0	-	69.90 (-0.50) [1]
McGovern et al. (2011)	Some concerns	ITT							
CBT			Civil	39.1	50.0	-	-	-	75.75 (0.22) [1]
McLay et al. (2017)	Some concerns	ITT							
PE			Veterans & Military	32.0	0.0	68.4	89.5	68.4	74.50 (0.07) [1]
Monson et al. (2006)	Low	ITT							
CPT			Veterans & Military	54.9	6.7	70.0	-	-	76.73 (0.35) [1]
Morland et al. (2019)	Some concerns	ITT							
PE			Veterans & Military	46.5	28.1	73.6	-	-	41.80 (0.91) [4]
PE			Veterans & Military	47.3	24.1	67.3	-	-	41.50 (0.64) [4]
PE			Veterans & Military	46.5	22.0	70.2	-	-	40.60 (0.71) [4]
Mueser et al. (2008)	Some concerns	ITT							
CBT			Civil	45.1	75.9	-	5.6	-	74.46 (0.07) [1]
Mueser et al. (2015)	Low	ITT							
CBT			Civil	43.0	70.2	-	-	-	86.06 (1.51) [1]
Nidich et al. (2018)	Low	ITT							
PE			Veterans & Military	48.5	18.0	52.0	-	-	80.60 (0.83) [1]
Nijdam et al. (2012)	High	ITT							
BEP			Civil	37.3	61.4	-	-	25.7	-
EMDR			Civil	38.3	51.4	-	-	34.0	-
Peck et al. (2023)	Some concerns	ITT							
PE			Civil	33.8	60.0	-	20.0	-	41.40 (0.75) [4]
PE			Civil	35.9	60.0	-	20.0	-	44.10(1.60) [4]
Peterson et al. (2022)	Some concerns	ITT							
CPT			Veterans & Military	38.5	5.0	75.0	-	30.0	35.6 (-1.52) [4]
CPT			Veterans & Military	41.9	12.0	81.0	-	40.0	37.60 (-0.81) [4]
CPT			Veterans & Military	41.4	18.0	77.0	-	47.0	37.30 (-0.71) [4]
Peterson et al. (2023)	High	ITT							
PE			Veterans & Military	39.0	24.0	61.0	-	36.0	37.56 (-0.74) [4]
PE			Veterans & Military	39.4	20.0	68.0	-	60.0	37.56 (-0.82) [4]
Popiel et al. (2015)	High	ITT							
PE			Civil	39.9	-	53.4	-	-	-
Rauch et al. (2015)	High	PP							
PE			Veterans & Military	-	-	-	-	-	79.20 (0.66) [1]
Ready et al. (2018)	Some concerns	ITT							
CBT			Veterans & Military	-	-	-	-	-	82.43 (1.06) [1]
Reger et al. (2016)	High	PP							
PE			Veterans & Military	30.9	5.6	72.2	100.0	70.4	78.28 (0.54) [1]
Resick et al. (2002)	High	PP							
CPT			Civil	-	100.0	-	-	-	74.76 (0.11) [1]
PE			Civil	-	100.0	-	-	-	76.60 (1.06) [1]

Study Treatment arm(s)	Overall bias	Type of Analysis	Population	M age	% female	% in committed relationship	% employed	% with college level education	M (z) PTSD severity
Resick et al. (2008)	Some concerns	PP							
CPT			Civil	-	-	-	-	-	70.19 (-0.47) [1]
CT			Civil	-	-	-	-	-	73.87 (0.47) [1]
Resick et al. (2015)	Some concerns	ITT							
CPT			Veterans & Military	31.8	7.0	82.0	100.0	69.0	59.30 (0.03) [3]
Resick et al. (2017)	Some concerns	ITT							
CPT			Veterans & Military	32.6	-	68.1	100.0	80.7	24.20 (-0.74) [2]
CPT			Veterans & Military	33.8	-	67.7	100.0	67.6	24.40 (-0.66) [2]
Rothbaum et al. (2005)	High	PP							
EMDR			Civil	-	100.0	-	-	-	-
PE			Civil	-	100.0	-	-	-	-
Sack et al. (2016)	Some concerns	PP							
EMDR			Civil	39.3	68.1	31.9	70.2	80.8	58.60 (-1.91) [1]
Schacht et al. (2017)	Some concerns	PP							
PE			Civil	36.0	77.0	-	-	-	72.77 (-0.14) [1]
PE			Civil	39.0	82.0	-	-	-	72.29 (0.12) [1]
Schnurr et al. (2003)	Some concerns	ITT							
CBT			Veterans & Military	50.6	0.0	51.5	46.9	-	80.41 (0.81) [1]
Schnurr et al. (2007)	Low	PP							
PE			Veterans & Military	44.6	100.0	31.9	-	-	77.60 (0.46) [1]
Schnurr et al. (2022)	Some concerns	ITT							
PE			Veterans & Military	45.5	20.7	54.1	40.4	47.5	39.90 (0.19)[4]
CPT			Veterans & Military	44.9	20.0	51.4	42.9	41.7	40.30 (0.16) [4]
Sloan, Marx, et al. (2018)	Some concerns	ITT							
CPT			Mixed	42.8	47.6	-	-	25.4	37.10 (-0.94) [4]
Sloan, Unger, et al. (2018)	Low	ITT							
CBT			Veterans & Military	54.4	0.0	75.1	86.	22.5	39.84 (-0.14) [4]
Stenmark et al. (2013)	Low	PP							
NET			Refugees	34.5	33.0	-	-	18.0	83.70 (1.22) [1]
Taylor et al. (2003)	High	PP							
EMDR			Civil	-	-	-	-	-	-
PE			Civil	-	-	-	-	-	-
Taylor et al. (2023)	Some concerns	ITT							
CPT			Veterans & Military	36.1	35.0	67.7	90.3	32.2	47.80 (-1.25) [3]
CPT			Veterans & Military	36.2	16.0	74.1	69.8	16.1	53.00 (NaN) [3]
CPT			Veterans & Military	36.3	29.0	67.7	93.6	22.6	53.70 (NaN) [3]
Ter Heide et al. (2016)	High	ITT							
EMDR			Refugees	43.1	16.7	-	-	-	74.70 (0.10) [1]
Thompson-Hollands et al. (2023)	Low	PP							
PE			Veterans & Military	-	100.0	-	-	-	-
Trottier et al. (2022)	High	ITT							
CBT			Civil	28.5	94.7	15.8	52.6	42.1	43.47 (1.56) [4]
Van den Berg et al. (2015)	High	ITT							
EMDR			Civil	40.4	54.6	21.8	7.3	7.3	72.10 (0.08) [1]
PE			Civil	42.6	56.6	20.8	15.1	13.2	69.60 (-0.54) [1]
Van der Kolk et al. (2007)	Some concerns	PP							
EMDR			Civil	38.7	75.9	-	-	51.7	69.40 (-0.56) [1]
Van Vliet et al. (2021)	High	ITT							
EMDR			Civil	-	35.5	-	20.2	6.9	39.34 (-0.06) [4]
EMDR			Civil	-	33.1	-	19.3	6.0	37.61 (-0.81) [4]

Study Treatment arm(s)	Overall bias	Type of Analysis	Population	M age	% female	% in committed relationship	% employed	% with college level education	M (z) PTSD severity
Vera et al. (2011)	High	PP							
PE			Civil	-	-	-	-	-	53.20 (-2.58) [1]
Wells et al. (2015)	High	PP							
PE			Civil	40.5	36.4	72.7	54.6	-	-
Yehuda et al. (2014)	High	PP							
PE			Veterans & Military	-	-	-	-	-	-
Yuen et al. (2015)	High	ITT							
PE			Veterans & Military	-	-	-	-	-	68.42 (-0.69) [1]
PE			Veterans & Military	-	-	-	-	-	65.27 (-1.41) [1]
Zaccari et al. (2022)	High	ITT							
CPT			Veterans & Military	44.2	100.0	37.5	-	-	79.4 (0.68) [4]

(table continues with further variables)

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Study Treatment arm(s)	% comorbid depression	M (z) depression score	M (z) anxiety score	Modification of treatment	Symptoms targeted	Treatment manualisation	Treatment format
Acarturk et al. (2016)							
EMDR	-	29.85 (0.67) [5]	2.65 (0.71) [10]	Other modification	PTSD	Manualised	Individual
Adenauer et al. (2011)							
NET	68.8	27.30 (0.41) [6]	-	None	PTSD	Manualised	Individual
Allen et al. (2022)							
CBT	-	15.91 (0.06) [7]	11.95 (-0.23) [15]	None	PTSD	Manualised	
Back et al. (2019)							
PE	38.9	29.20 (0.54) [5]	-	Other modification	PTSD + SUD	Manualised	Individual
Beck et al. (2009)							
CBT	-	22.40 (-0.84) [5]	22.20 (-0.61) [12]	None	PTSD	Manualised	Group
Belleville et al. (2018)							
CBT	15.0	-	-	None	PTSD	Manualised	Individual
Bisson et al. (2022)							
CBT	-	15.10 (-0.36) [7]	13.40 (1.23) [15]	None	PTSD	Manualised	Individual
Blanchard et al. (2003)							
CBT	-	-	-	None	PTSD	Manualised	Individual
Bohus et al. (2013)							
CBT	-	38.00 (2.33) [5]	-	Module therapy	PTSD + BPD	Manualised	Individual
Brady et al. (2021)							
NET	-	18.00(1.14) [7]	11.00 (-1.18) [15]	None	PTSD	Manualised	Individual
Bryant et al. (2003)							
PE	-	19.93 (-1.34) [5]	55.80 (0.66) [11]	None	PTSD	Manualised	Individual
PE + CT	-	19.33 (-1.84) [5]	53.47 (0.12) [11]	None	PTSD	Manualised	Individual
Bryant et al. (2008)							
CBT	-	21.79 (-0.96) [5]	56.93 (0.95) [11]	Other modification	PTSD	Manualised	Individual
CBT	-	24.23 (-0.68) [5]	59.32 (1.69) [11]	Other modification	PTSD	Manualised	Individual
CBT	-	25.38 (-1.02) [5]	58.25 (NaN) [11]	Other modification	PTSD	Manualised	Individual
CBT	-	24.03 (NaN) [5]	59.10 (NaN) [11]	Other modification	PTSD	Manualised	Individual
Bryant et al. (2011)							
CBT	-	22.30 (-0.86) [5]	-	Other modification	PTSD	Manualised	Individual
Bryant et al. (2013)							
CBT	60.0	28.10 (0.31) [5]	27.67 (0.14) [12]	Module therapy	PTSD	Manualised	Individual
CBT	67.0	26.06 (-0.25) [5]	27.94 (0.31) [12]	Module therapy	PTSD	Manualised	Individual
Bryant et al. (2019)							
CBT	66.7	33.00 (1.31) [5]	-	None	PTSD	Manualised	Individual
CBT	45.5	28.80 (0.41) [5]	-	Dose modification	PTSD	Manualised	Individual
Butollo et al. (2016)							
CPT	52.2	-	-	None	PTSD	Manualised	Individual
Castillo et al. (2016)							
CBT	68.2	-	-	Other modification	PTSD	Manualised	Group
Chard (2005)							
CPT	-	24.43 (-0.43) [5]	-	Other modification	PTSD	Manualised	Combined
Cloitre et al. (2002)							
PE	-	25.00 (-0.31) [5]	57.00 (0.96) [11]	Module therapy	PTSD	Manualised	Individual
Cloitre et al. (2010)							
PE	-	22.10 (-0.90) [5]	50.20 (-0.74) [11]	Module therapy	PTSD	Manualised	Individual
PE	-	18.80 (-1.97) [5]	50.40 (-0.71) [11]	Module therapy	PTSD	Manualised	Individual

Study Treatment arm(s)	% comorbid depression	M (z) depression score	M (z) anxiety score	Modification of treatment	Symptoms targeted	Treatment manualisation	Treatment format
Dell et al. (2022)							
PE	80.3	-	-	None	PTSD	Manualised	Individual
PE	82.0	-	-	Dose modification	PTSD	Manualised	Individual
Dunne et al. (2012)							
CBT	61.5	11.39 (-0.71) [9]	7.54 (-0.71) [9]	None	PTSD	Manualised	Individual
Ehlers et al. (2003)							
CT	-	18.80 (-1.57) [5]	21.60 (-0.69) [12]	None	PTSD	Manualised	Individual
Ehlers et al. (2005)							
CT	50.0	23.70 (-0.58) [5]	24.10 (-0.35) [12]	None	PTSD	Manualised	Individual
Ehlers et al. (2014)							
CT	22.6	21.90 (-0.94) [5]	28.42 (0.25) [12]	None	PTSD	Manualised	Individual
CT	40.0	23.93 (-0.75) [5]	26.23 (-0.13) [12]	Dose modification	PTSD	Manualised	Individual
Ehlers et al. (2023)							
CT	62.0	12.93 (-1.48) [7]	12.36 (0.18) [15]	Other modification	PTSD	Manualised	Individual
Falsetti et al. (2008)							
CBT	-	20.40 (-1.25) [4]	-	Other modification	PTSD + panic attacks	Manualised	Group
Fecteau & Nicki (1999)							
CBT	-	26.30 (-0.05) [5]	30.60 (0.55) [12]	None	PTSD	Manualised	Individual
Feske (2008)							
PE	-	27.22 (0.14) [5]	29.22 (0.36) [12]	None	PTSD	Manualised	Individual
Foa et al. (2018)							
PE	-	29.21 (0.54) [5]	-	None	PTSD	Manualised	Individual
PE	-	29.12 (0.48) [5]	-	Dose modification	PTSD	Manualised	Individual
Forbes et al. (2012)							
CPT	-	26.33 (-0.04) [5]	55.97 (0.71) [11]	None	PTSD	Manualised	Individual
Ford et al. (2018)							
PE	50.0	-	20.71 (NaN) [14]	None	PTSD + anger problems	Manualised	Individual
Franklin et al. (2017)							
PE	-	34.00 (1.52) [5]	27.00 (0.05) [12]	None	PTSD	Manualised	Individual
PE	-	35.30 (1.94) [5]	32.40 (1.47) [12]	None	PTSD	Manualised	Individual
Hensel-Dittmann et al. (2011)							
NET	86.7	29.64 (0.88) [6]	-	None	PTSD	Manualised	Individual
Hinton et al. (2011)							
CBT	-	-	2.50 (NaN) [13]	Cultural adaption	PTSD	Manualised	Group
Högberg et al. (2007)							
EMDR	-	29.50 (0.86) [6]	16.70 (-1.36) [12]	None	PTSD	Manualised	Individual
Hollifield et al. (2007)							
CBT	-	2.63 (NaN) [10]	2.40 (-0.71) [10]	None	PTSD	Manualised	Group
Karatzias et al. (2011)							
EMDR	-	11.30 (-1.08) [8]	15.60 (1.15) [8]	None	PTSD	Manualised	Individual
Kubany et al. (2004)							
CT	71.7	26.90 (0.07) [5]	-	Other modification	PTSD	Manualised	Individual
Langkaas et al. (2017)							
CBT	-	23.60 (-0.83) [5]	-	Other modification	PTSD	Manualised	Individual
PE	-	25.60 (-0.19) [5]	-	None	PTSD	Manualised	Individual
Lely et al. (2019)							
NET	61.1	-	-	None	PTSD	Manualised	Individual
Lindauer et al. (2005)							
BEP	25.0	11.80 (0.20) [8]	13.1 (-0.55) [8]	None	PTSD	Manualised	Individual

Study Treatment arm(s)	% comorbid depression	M (z) depression score	M (z) anxiety score	Modification of treatment	Symptoms targeted	Treatment manualisation	Treatment format
Markowitz et al. (2015)							
PE	53.0	20.20 (-1.02) [6]	-	None	PTSD	Manualised	Individual
Maxwell et al. (2016)							
CPT	-	-	-	None	PTSD	Manualised	Individual
McDonagh et al. (2005)							
CBT	-	18.90 (-1.55) [5]	53.50 (0.09) [11]	None	PTSD	Manualised	Individual
McGovern et al. (2011)							
CBT	-	21.10 (-1.04) [5]	-	Other modification	PTSD + SUD	Manualised	Individual
McLay et al. (2017)							
PE	-	-	-	None	PTSD	Manualised	Individual
Monson et al. (2006)							
CPT	53.3	25.39 (-0.23) [5]	54.38 (0.31) [11]	None	PTSD	Manualised	Individual
Morland et al. (2019)							
PE	-	31.70 (1.04) [5]	-	Other modification	PTSD	Manualised	Individual
PE	-	30.70 (0.86) [5]	-	Other modification	PTSD	Manualised	Individual
PE	-	29.70 (0.04) [5]	-	Other modification	PTSD	Manualised	Individual
Mueser et al. (2008)							
CBT	55.6	31.48 (1.01) [5]	48.29 (2.98) [12]	None	PTSD	Manualised	Individual
Mueser et al. (2015)							
CBT	-	30.54 (0.81) [5]	29.20 (0.35) [12]	None	PTSD	Manualised	Individual
Nidich et al. (2018)							
PE	50.0	17.00 (0.63) [7]	-	None	PTSD	Manualised	Individual
Nijdam et al. (2012)							
BEP	67.1	12.07 (0.88) [8]	13.01 (-0.61) [8]	None	PTSD	Manualised	Individual
EMDR	52.9	10.93 (NaN) [8]	12.38 (NaN) [8]	None	PTSD	Manualised	Individual
Peck et al. (2023)							
PE	-	29.70 (0.64) [5]	21.50 (-0.70) [12]	None	PTSD + other disorders	Manualised	Individual
PE	-	32.80 (1.36) [5]	25.30 (-0.37) [12]	Other modification	PTSD + other disorders	Manualised	Individual
Peterson et al. (2022)							
CPT	-	35.20 (1.76) [5]	-	None	PTSD	Manualised	Individual
CPT	-	32.40 (1.26) [5]	-	None	PTSD	Manualised	Individual
CPT	-	33.50 (0.97) [5]	-	None	PTSD	Manualised	Individual
Peterson et al. (2023)							
PE	-	-	-	Dose modification	PTSD	Manualised	Individual
PE	-	-	-	Dose modification	PTSD	Manualised	Individual
Popiel et al. (2015)							
PE	-	26.30 (-0.05) [5]	54.70 (0.39) [11]	None	PTSD	Manualised	Individual
Rauch et al. (2015)							
PE	-	-	-	None	PTSD	Manualised	Individual
Ready et al. (2018)							
CBT	-	29.76 (0.66) [5]	-	None	PTSD	Manualised	Group
Reger et al. (2016)							
PE	-	28.02 (0.30) [5]	22.11 (-0.62) [12]	None	PTSD	Manualised	Individual
Resick et al. (2002)							
CPT	43.5	23.70 (-0.58) [5]	-	None	PTSD	Manualised	Individual
PE	47.5	24.03 (-0.73) [5]	-	None	PTSD	Manualised	Individual
Resick et al. (2008)							
CPT	-	27.51 (0.20) [5]	50.67 (-0.62) [11]	None	PTSD	Manualised	Individual
CT	-	25.72 (-0.33) [5]	50.85 (-0.59) [11]	None	PTSD	Manualised	Individual

Study Treatment arm(s)	% comorbid depression	M (z) depression score	M (z) anxiety score	Modification of treatment	Symptoms targeted	Treatment manualisation	Treatment format
Resick et al. (2015)							
CPT	-	27.90 (0.28) [5]	-	None	PTSD	Manualised	Group
Resick et al. (2017)							
CPT	-	29.20 (0.54) [5]	-	Cultural adaption	PTSD	Manualised	Individual
CPT	-	29.50 (0.57) [5]	-	Cultural adaption	PTSD	Manualised	Group
Rothbaum et al. (2005)							
EMDR	-	16.70 (-0.27) [5]	43.33 (-0.52) [11]	None	PTSD	Manualised	Individual
PE	-	25.95 (-2.00) [5]	51.10 (-2.45) [11]	None	PTSD	Manualised	Individual
Sack et al. (2016)							
EMDR	44.7	24.00 (-0.51) [5]	-	None	PTSD	Manualised	Individual
Schacht et al. (2017)							
PE	47.0	-	-	None	PTSD	Manualised	Individual
PE	50.0	-	-	Cultural adaption	PTSD	Manualised	Individual
Schnurr et al. (2003)							
CBT	58.6	-	-	None	PTSD	Manualised	Group
Schnurr et al. (2007)							
PE	61.7	25.30 (-0.25) [5]	52.10 (-0.26) [11]	None	PTSD	Manualised	Individual
Schnurr et al. (2022)							
PE	67.9	30.30 (0.69) [5]	-	None	PTSD	Manualised	Individual
CPT	72.0	30.0 (0.77) [5]	-	None	PTSD	Manualised	Individual
Sloan, Marx, et al. (2018)							
CPT	-	-	-	None	PTSD	Manualised	Individual
Sloan, Unger, et al. (2018)							
CBT	55.1	23.85 (-0.55) [5]	18.22 (-1.15) [12]	None	PTSD	Manualised	Group
Stenmark et al. (2013)							
NET	41.7	19.70 (-1.13) [6]	-	None	PTSD	Manualised	-
Taylor et al. (2003)							
EMDR	-	23.20 (-0.17) [5]	-	None	PTSD	Manualised	Individual
PE	-	26.40 (-0.68) [5]	-	None	PTSD	Manualised	Individual
Taylor et al. (2023)							
CPT	-	-	-	None	PTSD	Manualised	Individual
CPT	-	-	-	Additional symptoms targeted	PTSD + specific problems	Manualised	Individual
CPT	-	-	-	Additional symptoms targeted	PTSD + specific problems	Manualised	Individual
Ter Heide et al. (2016)							
EMDR	77.8	-	-	None	PTSD	Manualised	Individual
Thompson-Hollands et al. (2023)							
PE	-	-	-	None	PTSD	Manualised	Individual
Trottier et al. (2022)							
CBT	-	27.53 (0.71) [9]	21.26 (0.71) [9]	Additional symptoms targeted	PTSD + other disorders	Manualised	Individual
Van den Berg et al. (2015)							
EMDR	-	28.20 (0.26) [5]	-	None	PTSD	Manualised	Individual
PE	-	30.90 (0.89) [5]	-	None	PTSD	Manualised	Individual
Van der Kolk et al. (2007)							
EMDR	-	16.20 (-2.10) [5]	-	None	PTSD	Manualised	Individual
Van Vliet et al. (2021)							
EMDR	-	-	-	None	PTSD	Manualised	Individual
EMDR	-	-	-	Module Therapy	PTSD	Manualised	Individual
Vera et al. (2011)							
PE	-	-	-	Cultural adaption	PTSD	Manualised	Individual

Study Treatment arm(s)	% comorbid depression	M (z) depression score	M (z) anxiety score	Modification of treatment	Symptoms targeted	Treatment manualisation	Treatment format
Wells et al. (2015)							
PE	36.4	32.50 (1.21) [5]	31.50 (0.67) [12]	None	PTSD	Manualised	Individual
Yehuda et al. (2014)							
PE	-	-	-	None	PTSD	Manualised	Individual
Yuen et al. (2015)							
PE	-	29.56 (0.61) [5]	27.68 (0.15) [12]	None	PTSD	Manualised	Individual
PE	-	26.94 (-0.04) [5]	21.75 (-1.28) [12]	None	PTSD	Manualised	Individual
Zaccari et al. (2022)							
CPT	-	34.90 (1.70) [5]	-	None	PTSD	Manualised	Group

(table continues with further variables)

(table continued with further variables)

Study Treatment arm(s)	Time limitation	M nr. of Sessions	Duration of sessions (min.)	Duration of treatment (weeks)	Homework	Treatment setting	Experience level of therapist
Acarturk et al. (2016)							
EMDR	-	4.2	-	-	No homework	In person	Trainees
Adenauer et al. (2011)							
NET	Low (≤ 12 sessions)	12.0	108.0	-	No homework	In person	Trainees
Allen et al. (2022)							
CBT	Low (≤ 12 sessions)	6.0	-	10.0	Homework	Telehealth	-
Back et al. (2019)							
PE	Low (≤ 12 sessions)	8.8	90.0	-	No homework	In person	Trainees
Beck et al. (2009)							
CBT	High (> 12 sessions)	14.0	120.0	30.0	Homework	In person	Experienced
Belleville et al. (2018)							
CBT	High (> 12 sessions)	15.0	75.0	15.0	No homework	In person	Trainees
Bisson et al. (2022)							
CBT	Low (≤ 12 sessions)	9.0	85.0	12.0	Homework	In person	Experienced
Blanchard et al. (2003)							
CBT	Low (≤ 12 sessions)	10.0	-	10.0	Homework	In person	Trainees
Bohus et al. (2013)							
CBT	High (> 12 sessions)	25.0	45.0	12.5	Homework	In person	Trainees
Brady et al. (2021)							
NET	High (> 12 sessions)	17.0	105.0	32.0	No homework	In person	Mixed
Bryant et al. (2003)							
PE	Low (≤ 12 sessions)	8.0	90.0	8.0	Homework	In person	Trainees
PE + CT	Low (≤ 12 sessions)	8.0	90.0	8.0	Homework	In person	Trainees
Bryant et al. (2008)							
CBT	Low (≤ 12 sessions)	8.0	100.0	8.0	Homework	In person	Trainees
CBT	Low (≤ 12 sessions)	8.0	100.0	8.0	Homework	In person	Trainees
CBT	Low (≤ 12 sessions)	8.0	100.0	8.0	Homework	In person	Trainees
CBT	Low (≤ 12 sessions)	8.0	100.0	8.0	Homework	In person	Trainees
Bryant et al. (2011)							
CBT	Low (≤ 12 sessions)	6.6	60.0	8.0	No homework	In person	Trainees
Bryant et al. (2013)							
CBT	Low (≤ 12 sessions)	7.2	90.0	12.0	Homework	In person	Trainees
CBT	Low (≤ 12 sessions)	9.1	90.0	12.0	Homework	In person	Trainees
Bryant et al. (2019)							
CBT	High (> 12 sessions)	9.4	90.0	12.0	No homework	In person	Trainees
CBT	High (> 12 sessions)	9.6	60.0	12.0	No homework	In person	Trainees
Butollo et al. (2016)							
CPT	High (> 12 sessions)	15.0	-	-	Homework	In person	Mixed
Castillo et al. (2016)							
CBT	High (> 12 sessions)	16.0	90.0	16.0	Homework	In person	Trainees
Chard (2005)							
CPT	High (> 12 sessions)	27.0	78.9	17.0	Homework	In person	Trainees
Cloitre et al. (2002)							
PE	High (> 12 sessions)	16.0	75.0	12.0	Homework	In person	Trainees
Cloitre et al. (2010)							
PE	High (> 12 sessions)	16.0	-	16.0	Homework	In person	No therapists
PE	High (> 12 sessions)	16.0	-	16.0	Homework	In person	No therapists

Study Treatment arm(s)	Time limitation	M nr. of Sessions	Duration of sessions (min.)	Duration of treatment (weeks)	Homework	Treatment setting	Experience level of therapist
Dell et al. (2022)							
PE	Low (≤ 12 sessions)	10.0	90.0	10.0	Homework	Combination	-
PE	Low (≤ 12 sessions)	10.0	90.0	2.0	Homework	Combination	-
Dunne et al. (2012)							
CBT	Low (≤ 12 sessions)	9.8	60.0	10.0	Homework	In person	Experienced
Ehlers et al. (2003)							
CT	Low (≤ 12 sessions)	9.0	90.0	12.0	No homework	In person	-
Ehlers et al. (2005)							
CT	Low (≤ 12 sessions)	10.0	62.5	13.0	No homework	In person	-
Ehlers et al. (2014)							
CT	Low (≤ 12 sessions)	10.1	-	14.0	Homework	In person	Mixed
CT	High (> 12 sessions)	10.1	105.0	1.0	Homework	In person	Mixed
Ehlers et al. (2023)							
CT	-	-	-	12.0	No homework	Telehealth	Trainees
Falsetti et al. (2008)							
CBT	Low (≤ 12 sessions)	12.0	90.0	12.0	Homework	In person	Mixed
Fecteau & Nicki (1999)							
CBT	Low (≤ 12 sessions)	4.0	120.0	4.0	Homework	In person	Trainees
Feske (2008)							
PE	Low (≤ 12 sessions)	10.0	90.0	10.0	Homework	In person	No therapists
Foa et al. (2018)							
PE	Low (≤ 12 sessions)	10.0	90.0	8.0	Homework	In person	No therapists
PE	Low (≤ 12 sessions)	10.0	90.0	2.0	Homework	In person	No therapists
Forbes et al. (2012)							
CPT	Low (≤ 12 sessions)	12.0	62.5	6.0	Homework	In person	Trainees
Ford et al. (2018)							
PE	Low (≤ 12 sessions)	10.0	82.5	10.0	No homework	In person	Trainees
Franklin et al. (2017)							
PE	Low (≤ 12 sessions)	10.0	-	12.0	Homework	Telehealth	Experienced
PE	Low (≤ 12 sessions)	10.0	-	12.0	Homework	Telehealth	Experienced
Hensel-Dittmann et al. (2011)							
NET	Low (≤ 12 sessions)	10.0	90.0	13.0	No homework	In person	-
Hinton et al. (2011)							
CBT	High (> 12 sessions)	14.0	60.0	14.0	Homework	In person	No therapists
Högberg et al. (2007)							
EMDR	Low (≤ 12 sessions)	5.0	90.0	8.0	No homework	In person	Experienced
Hollifield et al. (2007)							
CBT	Low (≤ 12 sessions)	12.0	120.0	12.0	Homework	In person	-
Karatzias et al. (2011)							
EMDR	Low (≤ 12 sessions)	3.7	60.0	-	No homework	In person	Experienced
Kubany et al. (2004)							
CT	High (> 12 sessions)	9.5	90.0	-	Homework	In person	No therapists
Langkaas et al. (2017)							
CBT	Low (≤ 12 sessions)	10.0	105.0	10.0	Homework	In person	Trainees
PE	Low (≤ 12 sessions)	10.0	105.0	10.0	Homework	In person	Trainees
Lely et al. (2019)							
NET	High (> 12 sessions)	9.5	90.0	19.0	No homework	In person	Mixed
Lindauer et al. (2005)							
BEP	High (> 12 sessions)	16.0	52.5	16.0	Homework	In person	Experienced

Study Treatment arm(s)	Time limitation	M nr. of Sessions	Duration of sessions (min.)	Duration of treatment (weeks)	Homework	Treatment setting	Experience level of therapist
Markowitz et al. (2015)							
PE	Low (≤ 12 sessions)	8.3	90.0	14.0	Homework	In person	Mixed
Maxwell et al. (2016)							
CPT	Low (≤ 12 sessions)	10.4	90.0	6.0	Homework	In person	-
McDonagh et al. (2005)							
CBT	High (> 12 sessions)	14.0	105.0	17.5	Homework	In person	Trainees
McGovern et al. (2011)							
CBT	High (> 12 sessions)	13.0	47.5	13.0	Homework	In person	Mixed
McLay et al. (2017)							
PE	Low (≤ 12 sessions)	10.0	90.0	9.0	Homework	In person	No therapists
Monson et al. (2006)							
CPT	Low (≤ 12 sessions)	12.0	-	6.0	Homework	In person	Trainees
Morland et al. (2019)							
PE	High (> 12 sessions)	9.8	90.0	9.8	Homework		-
PE	High (> 12 sessions)	8.3	90.0	8.3	Homework	Telehealth	-
PE	High (> 12 sessions)	7.0	90.0	7.0	Homework	Telehealth	-
Mueser et al. (2008)							
CBT	High (> 12 sessions)	14.0	-	-	Homework	In person	Trainees
Mueser et al. (2015)							
CBT	High (> 12 sessions)	14.0	-	-	Homework	In person	Trainees
Nidich et al. (2018)							
PE	Low (≤ 12 sessions)	12.0	90.0	12.0	Homework	In person	Trainees
Nijdam et al. (2012)							
BEP	High (> 12 sessions)	14.7	52.5	-	No homework	In person	Mixed
EMDR	Low (≤ 12 sessions)	6.5	90.0	-	No homework	In person	Mixed
Peck et al. (2023)							
PE	Low (≤ 12 sessions)	12.0	60.0	12.0	Homework	Combination	Mixed
PE	Low (≤ 12 sessions)	12.0	60.0	12.0	Homework	Combination	Mixed
Peterson et al. (2022)							
CPT	Low (≤ 12 sessions)	12.0	60.0	6.0	No homework	In person	-
CPT	Low (≤ 12 sessions)	12.0	60.0	6.0	No homework	In person	-
CPT	Low (≤ 12 sessions)	12.0	60.0	6.0	No homework	Telehealth	-
Peterson et al. (2023)							
PE	High (> 12 sessions)	15.0	90.0	3.0	No homework	In person	Mixed
PE	High (> 12 sessions)	15.0	90.0	3.0	No homework	In person	Mixed
Popiel et al. (2015)							
PE	Low (≤ 12 sessions)	8.6	90.0	11.0	Homework	In person	Experienced
Rauch et al. (2015)							
PE	Low (≤ 12 sessions)	11.0	80.0	-	Homework	In person	-
Ready et al. (2018)							
CBT	High (> 12 sessions)	32.0	180.0	16.0	Homework	In person	-
Reger et al. (2016)							
PE	Low (≤ 12 sessions)	7.5	105.0	-	Homework	In person	Trainees
Resick et al. (2002)							
CPT	Low (≤ 12 sessions)	12.0	87.5	6.0	Homework	In person	Trainees
PE	Low (≤ 12 sessions)	12.0	65.0	6.0	Homework	In person	Trainees
Resick et al. (2008)							
CPT	Low (≤ 12 sessions)	12.0	60.0	6.0	Homework	In person	Experienced
CT	Low (≤ 12 sessions)	12.0	60.0	6.0	Homework	In person	Experienced

Study Treatment arm(s)	Time limitation	M nr. of Sessions	Duration of sessions (min.)	Duration of treatment (weeks)	Homework	Treatment setting	Experience level of therapist
Resick et al. (2015)							
CPT	Low (≤ 12 sessions)	12.0	90.0	6.0	No homework	In person	-
Resick et al. (2017)							
CPT	Low (≤ 12 sessions)	12.0	60.0	6.0	No homework	In person	-
CPT	Low (≤ 12 sessions)	12.0	90.0	6.0	No homework	In person	-
Rothbaum et al. (2005)							
EMDR	Low (≤ 12 sessions)	9.0	90.0	4.5	No Homework	In person	Trainees
PE	Low (≤ 12 sessions)	9.0	90.0	4.5	Homework	In person	Trainees
Sack et al. (2016)							
EMDR	Low (≤ 12 sessions)	4.2	-	4.2	No Homework	In person	Experienced
Schacht et al. (2017)							
PE	Low (≤ 12 sessions)	1.8	60.0	12.0	Homework	In person	-
PE	Low (≤ 12 sessions)	7.1	60.0	12.0	Homework	In person	-
Schnurr et al. (2003)							
CBT	High (> 12 sessions)	21.8	92.0	30.0	Homework	In person	Trainees
Schnurr et al. (2007)							
PE	Low (≤ 12 sessions)	8.0	90.0	10.0	Homework	In person	Trainees
Schnurr et al. (2022)							
PE	High (> 12 sessions)	8.2	90.0	8.0	No Homework	In person	Mixed
CPT	High (> 12 sessions)	9.1	60.0	9.0	No Homework	In person	Mixed
Sloan, Marx, et al. (2018)							
CPT	Low (≤ 12 sessions)	12.0	60.0	12.0	Homework	In person	Trainees
Sloan, Unger, et al. (2018)							
CBT	High (> 12 sessions)	14.0	120.0	16.0	Homework	In person	No therapists
Stenmark et al. (2013)							
NET	Low (≤ 12 sessions)	10.0	90.0	10.0	Homework	In person	No therapists
Taylor et al. (2003)							
EMDR	Low (≤ 12 sessions)	8.0	90.0	-	Homework	In person	Experienced
PE	Low (≤ 12 sessions)	8.0	90.0	-	Homework	In person	Experienced
Taylor et al. (2023)							
CPT	High (> 12 sessions)	18.0	60.0	12.0	No Homework	In person	-
CPT	High (> 12 sessions)	18.0	60.0	12.0	No Homework	In person	-
CPT	High (> 12 sessions)	18.0	60.0	12.0	No Homework	In person	-
Ter Heide et al. (2016)							
EMDR	Low (≤ 12 sessions)	9.0	80.0	-	No Homework	In person	Mixed
Thompson-Hollands et al. (2023)							
PE	Low (≤ 12 sessions)	7.62	90.0	10.0	Homework	In person	Trainees
Trottier et al. (2022)							
CBT	High (> 12 sessions)	16.0	77.5	14.0	No Homework	In person	Trainees
Van den Berg et al. (2015)							
EMDR	Low (≤ 12 sessions)	7.8	90.0	10.0	No Homework	In person	Trainees
PE	Low (≤ 12 sessions)	7.1	90.0	10.0			Trainees
Van der Kolk et al. (2007)							
EMDR	Low (≤ 12 sessions)	8.0	90.0	8.0	No Homework	In person	Experienced
Van Vliet et al. (2021)							
EMDR	High (> 12 sessions)	17.0	90.0	8.0	No Homework	In person	Trainees
EMDR	High (> 12 sessions)	25.0	90.0	12.0	No Homework	In person	Trainees
Vera et al. (2011)							
PE	High (> 12 sessions)	15.0	105.0	15.0	Homework	In person	Experienced

Study Treatment arm(s)	Time limitation	M nr. of Sessions	Duration of sessions (min.)	Duration of treatment (weeks)	Homework	Treatment setting	Experience level of therapist
Wells et al. (2015)							
PE	Low (≤ 12 sessions)	8.0	60.0	8.0	Homework	In person	Trainees
Yehuda et al. (2014)							
PE	Low (≤ 12 sessions)	12.0	90.0	12.0	Homework	In person	Mixed
Yuen et al. (2015)							
PE	Low (≤ 12 sessions)	10.3	90.0	10.0	Homework	In person	Trainees
PE	Low (≤ 12 sessions)	10.3	90.0	10.0	Homework	Telehealth	Trainees
Zaccari et al. (2022)							
CPT	Low (≤ 12 sessions)	12.0	90.0	12.0	No Homework	In person	-

Note. Total N = sum of participants in control and treatment conditions; n = number of non-responders; N = total number of participants in group; Int = intervention group; CG = control group; CBT = cognitive behavioral therapy; nr. = number; min = minutes; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy; M.I.N.I. PLUS = Mini-International Neuropsychiatric Interview Plus; CAPS = Clinician-Administered PTSD Scale; Veterans & Military = Veterans & Military Personnel; PDS = Posttraumatic Diagnostic Scale; SCID = Structured Clinical Interview for DSM; PSS-I = PTSD Symptom Scale-Interview; PCL = PTSD Checklist; PSS-SR = Posttraumatic Symptom Scale-Self Report; SI-PTSD = Structured Interview for Posttraumatic Stress Disorder; MPSS-SR = Modified PTSD Symptom Scale Self-Report; TAU = treatment as usual; ITT = intention-to-treat; PP = per-protocol; NaN = not a number; PTSD = posttraumatic stress disorder; SUD = substance use disorder; BPD = borderline personality disorder.

[1] Assessment tool: Clinician-Administered PTSD Scale (CAPS).
[2] Assessment tool: PTSD Symptom Scale - Interview (PSS-I).
[3] Assessment tool: PTSD Checklist (PCL).
[4] Assessment tool: Clinician-Administered PTSD Scale (CAPS-5).
[5] Assessment tool: Beck Depression Inventory (BDI).
[6] Assessment tool: Hamilton Depression Scale (HDRS / HRSD / HAM-D).
[7] Assessment tool: Patient Health Questionnaire-(PHQ)-9.
[8] Assessment tool: Hospital Anxiety and Depression Scale (HADS).
[9] Assessment tool: Depression Anxiety and Stress Scale (DASS).
[10] Assessment tool: Hopkins Symptom Checklist-25 (HSCL-25).
[11] Assessment tool: State-Trait Anxiety Inventory (STAI).
[12] Assessment tool: Beck Anxiety Inventory (BAI).
[13] Assessment tool: Anxiety subscale of the symptom checklist-90-R (SCL).
[14] Assessment tool: State Trait Anger Expression Trait Scale (STAX-trait)
[15] Assessment tool: Generalized Anxiety Disorder Questionnaire (GAD-7)

C8. Forest Plot of *OR*

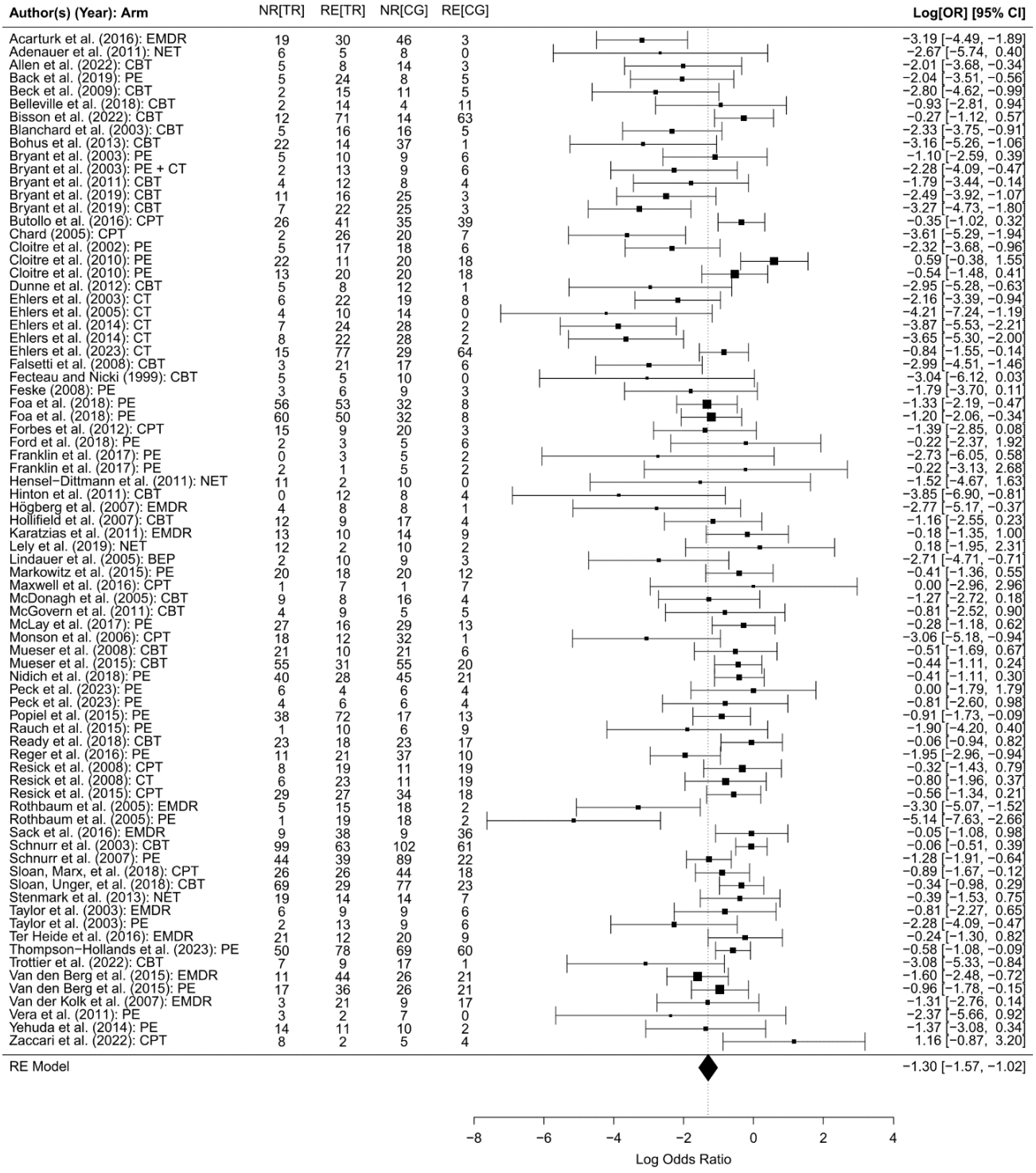

Figure C8.1 Forest Plot of log OR

NR[TR] = number of non-responders treatment group; RE[TR] = number of responders treatment group; NR[CG] = number of non-responders control group; RE[CG] = number of responders control group; CI = confidence interval; Log *OR* = log transformed Odds Ratio; CBT = cognitive behavioral therapy; CPT = cognitive processing therapy; CT = cognitive therapy; PE = prolonged exposure therapy; BEP = brief eclectic therapy; EMDR = eye movement desensitization and reprocessing; NET = narrative exposure therapy.

C9. GRADE: Summary of Findings

Summary of findings 1. Prevalence and predictors of non-response to first-line guideline-recommended psychological treatments for PTSD

Outcomes	№ of participants (studies)	Certainty of the evidence (GRADE)	Results on non-response
Non-response rate Follow-up: post-treatment conducted between 0 days and 6 weeks after end of intervention	7894 (86 RCTs)	⨁⨁◯◯ Low[a,b,c]	• The weighted average non-response rate across all studies in active treatment conditions was 39.23%, 95% CI [35.08%, 43.53%] • Subgroup analyses and meta-regression revealed type of analysis, population, type of intervention, treatment format, year of publication, age, gender, PTSD symptom severity, comorbid depression, and baseline depression score as significant predictors
Odds ratio Follow-up: post-treatment conducted between 0 days and 6 weeks after end of intervention	5231 (67 RCTs)	⨁⨁◯◯ Low[a,c,d]	The pooled *OR* was 0.22, 95% CI [0.17, 0.26], indicating that non-response was less frequent in the treatment condition compared to the control condition.

CI: confidence interval; ***OR*:** odds ratio.

GRADE Working Group grades of evidence
High certainty: we are very confident that the true effect lies close to that of the estimate of the effect.
Moderate certainty: we are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low certainty: our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect.
Very low certainty: we have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect.

Explanations

a. Downgrade one level for risk of bias because the proportion of information from studies at high risk of bias is sufficient to affect the interpretation of the results.

b. Downgraded one level for inconsistency because of substantial to considerable heterogeneity (I^2 = 83.12%). Not downgraded two levels for inconsistency because extensive predictor analyses were performed to explain heterogeneity.

c. Assessment of publication bias, large effect, plausible confounding criteria not applicable. Explanations: primary outcome is not effect size; primary outcome does not include comparison; analysis of secondary outcome (non-response rate) from included studies, therefore no risk of publication bias.

e. Downgraded one level for inconsistency because of substantial heterogeneity (I^2 = 69.80%).

C10. Risk of Bias Assessment

The RoB rating was based on either the assessment provided in the PTSD-Repository or for studies not included in the Repository an additional rating was conducted. The evaluation included an assessment of different biases represented by five distinct domains: randomization process, deviation from intended intervention, missing outcome data, measurement of outcome, and selection of the reported results. The overall RoB judgement was derived from the judgment within each domain.

Table C10.1 Rating of Risk of Bias Domains and Overall Risk of Bias in Percentages

	Low risk	Some concerns	High risk
Number of studies (*n* = 86)			
Bias arising from the randomization process (%)	44.19	45.35	10.47
Bias due to deviations from intended interventions (%)	76.74	3.49	19.77
Bias due to missing outcome data (%)	65.12	11.63	23.26
Bias in measurement of the outcome (%)	59.30	23.26	17.44
Bias in selection of the reported result (%)	86.05	13.95	-
Overall risk of bias (%)	12.79	37.21	50.0

Note. Data from O'Neil ME, Cheney T, Yu Y, et al. *Pharmacologic and Nonpharmacologic Treatments for Posttraumatic Stress Disorder: 2023 Update of the Evidence Base for the PTSD Trials Standardized Data Repository.* Agency for Healthcare Research and Quality (US).; September 2023. https://doi.org/10.23970/AHRQEPCPTSD2023 and from an additional rating for studies not included in the PTSD Repository.

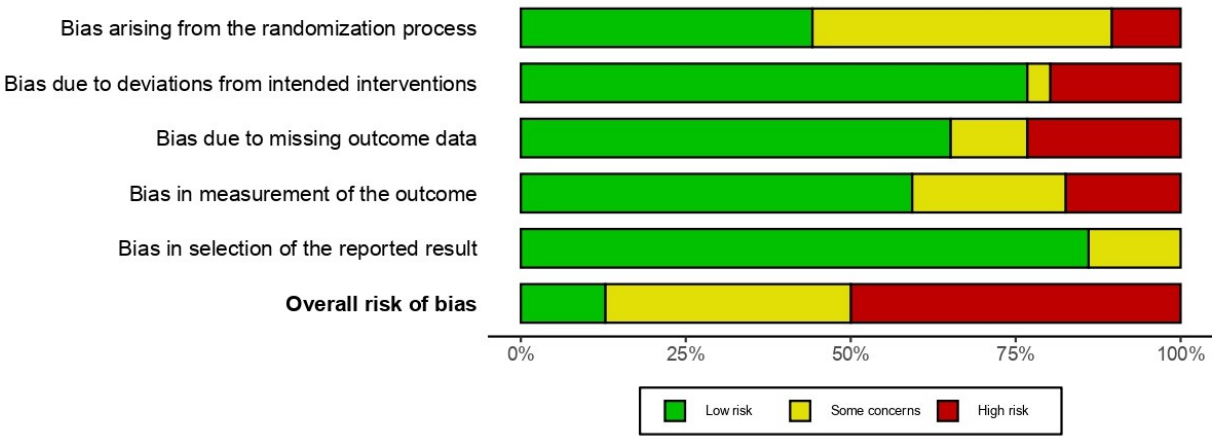

Figure C10.1 Rating of Risk of Bias Domains and Overall Risk of Bias in Percentages Weighted by Sample Size

Data from O'Neil ME, Cheney T, Yu Y, et al. *Pharmacologic and Nonpharmacologic Treatments for Posttraumatic Stress Disorder: 2023 Update of the Evidence Base for the PTSD Trials Standardized Data Repository.* Agency for Healthcare Research and Quality (US).; September 2023. https://doi.org/10.23970/AHRQEPCPTSD2023 from an additional rating for studies not included in the PTSD Repository.

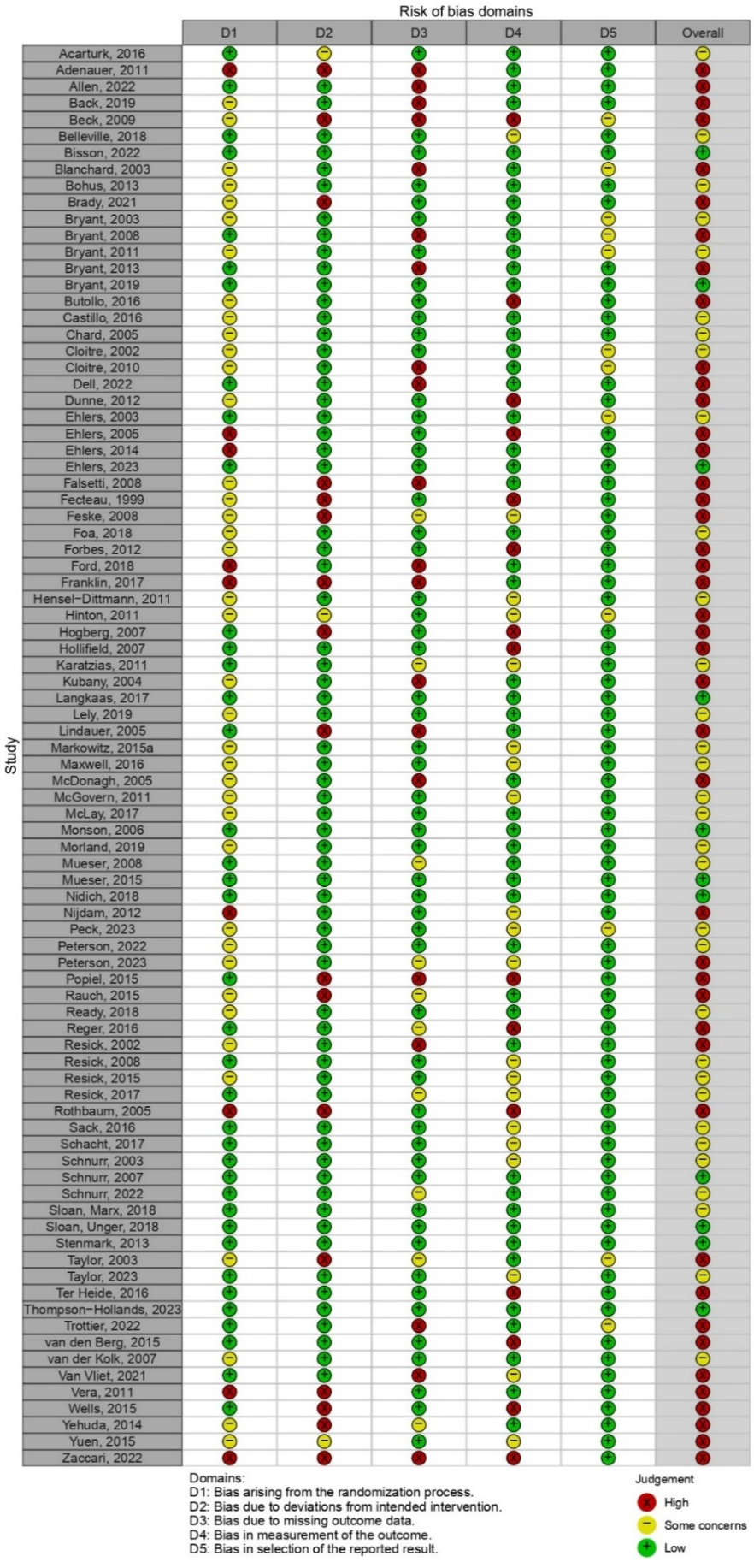

Figure C10.2 Rating of Risk of Bias Domains and Overall Risk of Bias for Individual Studies

Data from Data from O'Neil ME, Cheney T, Yu Y, et al. *Pharmacologic and Nonpharmacologic Treatments for Posttraumatic Stress Disorder: 2023 Update of the Evidence Base for the PTSD Trials Standardized Data Repository.* Agency for Healthcare Research and Quality (US).; September 2023. https://doi.org/10.23970/AHRQEPCPTSD2023 from an additional rating for studies not included in the PTSD Repository