Dissertation

Concomitant use of synthetic cathinones in opioid-dependent patients receiving opioid maintenance treatment

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1 Background

1.1 New psychoactive substances

New psychoactive substances (NPS) were first detected on the European drug market in the mid-2000s (1). Since then the use of these substances has increased rapidly in Europe. In Germany deaths owing to NPS with or without the combination of other drugs have increased fourfold in 2016 compared to 2014 (2,3).

Before the term NPS was introduced in 2012 by the United Nations Office on Drugs and Crime (UNODC) many different names, as ‘legal highs’ or ‘research chemicals’ were used for describing these substances. This was due to the fact that suppliers aimed for different user groups by labelling these substances with various names. ‘Legal highs’ for example are sold in colourful and appealing packaging to attract mainly recreational drug users (4). Whereas ‘research chemicals’ are camouflaged as substances, which are used for scientific research, but are actually directed at drug users who are eager to experiment with the effects of psychoactive substances (4).

The UNODC nowadays defines NPS as ‘substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat’. Hereby it must be noted that the term ‘new’ does not always refer to new substances but to substances, which abuse is newly emerging on the drug market (5).

Many different substance groups categorise under NPS but the largest groups are synthetic cannabinoids, synthetic cathinones and phenethylamines. Synthetic cannabinoids and synthetic cathinones alone file for more than two thirds of all NPS (6). Other substances that rank amongst NPS are, among others, piperazines, tryptamines and synthetic opioids (5).

1.1.1 Synthetic cannabinoids

Synthetic cannabinoids have comparable effects as cannabis due to the fact that they are functionally similar to THC (Δ^9-tetrahydrocannabinol), the active principle of cannabis (5). Therefore, they induce psychoactive effects by activating the cerebral endogenous cannabinoid system (7,8). Synthetic cannabinoids are sold under countless different names but the most known ones are 'Spice' and 'K2' (6,7). These compounds usually contain a herbal mixture, which has been sprayed with different sorts of synthetic cannabinoids (8,11). The first synthetic cannabinoid, namely JWH-018, was identified in Europe in 2008, two years after online shops started to sell 'Spice' (12).

The most commonly used route of administration with synthetic cannabinoids is inhaling. Other routes, that have been described in the literature, are oral and rectal administration (13). The side effects of synthetic cannabinoids are reportedly more diverse and more serious than those of cannabis. Most commonly seen are tachycardia, agitation, hallucinations, hypokalaemia and hyperglycaemia (14). Since synthetic cannabinoids were first detected the number of substances filing under this group has increased rapidly and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) counts nowadays more than 130 forms of synthetic cannabinoids (1).

1.1.2 Phenethylamines

Phenethylamines are a group of stimulant drugs. To this group appertain for example the ring-substituted substances of the '2C series', like 2C-E and 2C-B, the 'D series', as well as benzodifurans (5). Amphetamine, methamphetamine and MDMA (3,4-methylenedioxy-N-methylamphetamine) also appertain to the group of phenethylamines, but are controlled by the 1971 Convention and are therefore by definition not NPS.

The substances belonging to the '2C-series' are drugs with both hallucinogenic and stimulant effects (15). 2C-B (2,5-dimethoxy-4-bromophenethylamine), also known as 'Nexus', was the first identified substance of the 2C-series (16) and it was synthesised in 1974 (5).

Other substances that appertain to this group are, among many others, 2C-E (2,5-dimethoxy-4-ethylphenethylamine) and 2C-C (2,5-dimethoxy-4-chlorophenethylamin). 2C-E and 2C-C emerged on the drug market in the 1990s when 2C-B was controlled in some countries (17). The 2C-series is mostly administered orally or nasally (18). Reported side-effects of these substances are agitation, seizures, hyperthermia and psychosis (15,19).

1.1.3 Synthetic cathinones

Synthetic cathinones are closely related to the phenethylamine family due to the fact that their chemical structure consists of a β-keto group attached to a phenethylamine (20). Their name derives from their chemical semblance with cathinone, an alkaloid found in the leaves of the plant Catha edulis, also known as Khat plant (6). Figure 1 shows the chemical structure of cathinone. The Khat plant has a stimulant effect when chewed, which is explained by the similarity of the chemical structure of cathinone with that of amphetamines (21). Therefore, synthetic cathinones are claimed to be stimulants with amphetamine-like effects (22). This derives from the fact that cathinone works as a dopamine and norepinephrine releasing agent (23). The consequential effects users are consuming these for are reportedly euphoria, loquacity, clear thinking and sexual stimulation (24).

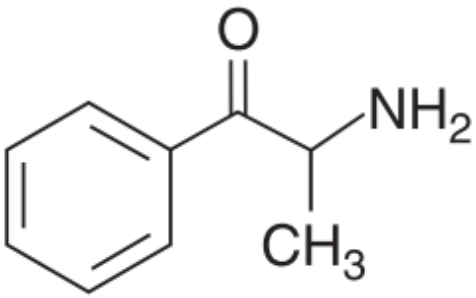

Figure 1: Chemical structure of cathinone (25).

The first synthetic cathinones were synthesised in 1929 (26) but abuse of these substances did not find its roots until the early 21st century, when they were introduced as a legal alternative to MDMA (21,27). Their popularity rose rapidly since users could easily purchase these substances via internet or headshops due to their legality (28,29). Here they were named with intentionally misleading names as 'bath salts' or 'plant fertilisers' (30). Until today the term 'bath salts' is still used colloquially for these substances. Therefore, in this study the term synthetic cathinones will be used equally with the term 'bath salts' and vice versa.

The 'bath salt' compounds were sold under countless different names and were labelled with the phrase 'not for human consumption', which is also often the case with other NPS. The reason for this is to circumvent drug controls and to aggravate controlling the use of NPS (30,31). The sold compounds can contain either a mixture of different synthetic cathinones combined with other substances as caffeine or solely one pure synthetic cathinone (32).

Mephedrone or 4-MMC (4-methylmethcathinone) was one of the first identified substances to appertain to the group of synthetic cathinones and is still the most abused synthetic cathinone in Europe (21). It is sold under different street names as 'Meow Meow' and 'M-Cat' (20). When mephedrone came on the market and increased in popularity, it was mainly used in the party scene as an alternative for ecstasy. It was especially popular around 2010 in the United Kingdom (UK) among clubbers and students (33,34). Karila et al. noted that by 2010 mephedrone was one of the top three most frequently used drugs in the UK (6). Figure 2 shows the chemical structure of mephedrone, and compared to Figure 1 the resemblance with cathinone can be seen.

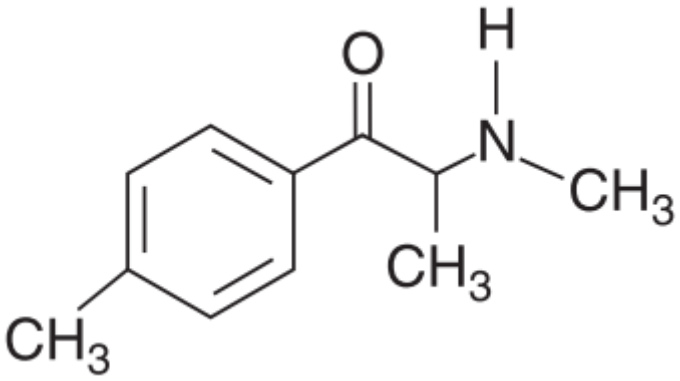

Figure 2: Chemical structure of mephedrone, a synthetic cathinone (25).

However, the number of substances that rank among synthetic cathinones is growing rapidly with now more than 80 substances adding to this group (27). The most detected compounds besides mephedrone are nowadays MDPV and 4-MEC (35).

MDPV (3,4-methylenedioxypyrovalerone) was first detected in Germany in 2007 (36). The effects of MDPV occur at a lower dose than those of mephedrone and have a longer duration (35). This can be explained by the fact that MDPV also works as a dopamine reuptake inhibitor. This is comparable with how cocaine works, which also acts as a dopamine reuptake inhibitor, but MDPV is reportedly 100 times more potent in this function (23).

A different synthetic cathinone, which is closely related to MDPV and therefore works comparably, is alpha-PVP (alpha-pyrrolidinovalerophenone) (23). It is also known under the slang name 'Flakka' and was especially noticed in the United States due to a vast increase of abuse of this substance in Florida in 2015 (37). Other popular synthetic cathinones are 4-MEC (4-methylethcathinone) and methylone (βk-MDMA or 3,4-methylenedioxymethcathinone), a close analogue of MDMA (38).

Most of the 'bath salts' are sold as white or brown powders, or less frequently as pills marked as ecstasy (5,35). But also other forms exist. Methylone for example was sold under the name 'explosion' as a so-called 'room odoriser' in liquid form in the Netherlands around the year 2005 (38).

The administration routes of synthetic cathinones vary from snorting, oral ingestion, rectal insertion to intravenous or intramuscular injection depending on the user and the compound (39). In the club scene these drugs are mainly used orally, for example by bombing, thus by swallowing the substance wrapped in paper, or through snorting (5).

Due to the fact that many synthetic cathinones only recently have been emerging on the drug market it is difficult to detect all of these via toxicology screens (22). Although the metabolites of some synthetic cathinones like mephedrone (40,41), MDPV (42) and alpha-PVP (43) can be identified, many other metabolites have not been characterised yet and are therefore not caught by toxicology screens.

Regarding the side effects of synthetic cathinones many have been reported. Apart from the common cardiovascular side effects associated with stimulants such as tachycardia, palpitations and hypertension, also many psychiatric side effects can occur from synthetic cathinones (44,45). Most frequently seen are aggression, agitation, anxiety, hallucinations and psychosis (30,35,46,47). To add to this the serious health effects of 'bath salts' that have been reported are renal failure, rhabdomyolysis, hyperthermia and seizures (48).

Furthermore, many case-reports have presented fatalities associated with synthetic cathinones as, among others, methylone and butylone (49) as well as mephedrone (50–52) and MDPV (53). Regarding deaths solely involving alpha-PVP more than 100 fatalities have been reported by the EMCDDA and Europol in Europe (54).

Regarding the overall number of users of synthetic cathinones or NPS in general in Germany various data can be found. In the German national report on drugs and addiction of 2017 it is noted, that 2.8 % of the Germans in the age group of 18 to 64 years have used NPS at least once in their lifetime and nearly 1 % in the preceding year (3). A survey from 2011 in which interviews were carried out in the EU member states included around 12,000 people aged between 15 and 24 years. Here of the study population from Germany 4 % had used NPS before (55). A German online survey from 2012 focussed on the use of NPS regarding people with drug use experience and with a lifetime prevalence of illicit drug use of 99 %. Here of the 860 included people 86 % had used synthetic cannabinoids before. 35 % noted the use of other 'legal highs' including 'bath salts' and 39 % stated to have used 'research chemicals' before, defined as new pure synthetic substances labelled with their chemical name. Also more than 50 % of the study population had used NPS in the preceding month (29).

1.1.4 Legal situation Germany

Due to its side effects and the related fatalities mephedrone was the first synthetic cathinone to be included in the Narcotic Drugs Act in Germany in 2010 (56). Meanwhile more and more synthetic cathinones and other NPS have been added to the act and are therefore illegal. The approach in Germany is that an NPS is added to the Narcotics Act (Betäubungsmittelgesetz, BtMG) based on its chemical structure (57).

Table 1 gives an overview of most of the synthetic cathinones controlled by the German Narcotics Act. Table 14 (Appendix I) shows the corresponding IUPAC names of these synthetic cathinones. The German Narcotics Act includes three Annexes. The substances of each Annex are controlled differently. Substances listed in Annex I are narcotics that are not tradable and non-prescribable, for example MDMA. Substances in Annex II are narcotics that cannot be prescribed but are tradable, like methamphetamine. In Annex III the narcotics are listed which are tradable and can be prescribed, for example methadone (57,58).

Table 1: Overview of controlled synthetic cathinones in the German Narcotics Act.

Annex	Synthetic cathinone
Annex I	Clephedrone (4-CMC, 4-Chlormethcathinone)
	N-Ethylbuphedrone (NEB)
	4-Ethylmethcathinone (4-EMC)
	Ethylone (bk-MDEA, MDEC)
	Methcathinone (Ephedrone)
	3-Methylmethcathinone (3-MMC)
	4-Methylmethcathinone (Mephedrone)
	Pentylone (bk-MBDP)
Annex II	Buphedrone
	3,4-Dimethylmethcathinone (3,4-DMMC)
	Ethcathinone
	Flephedrone (4-Fluormethcathinon, 4-FMC)
	3-Fluormethcathinone (3-FMC)
	3,4-Methylendioxypyrovalerone (MDPV)
	4-Methylethcathinone(4-MEC)
	Methylone (3,4-Methylendioxy-N-methcathinon, MDMC)
	Pentedrone
	α-Pyrrolidinovalerophenone (α-PVP)

However, the main issue, not only with synthetic cathinones but with all NPS, is that there is an ongoing offer of new substances on the market. Solely in the year 2015, nearly one hundred new NPS have been detected on the European drug market (59). This derives from the fact that if substances are added to the narcotics act this is purely based on their chemical structure.

Therefore, suppliers and laboratories modify the chemical structures of the substances to circumvent drug controls and to stay ahead of the law (60). This leads to a continuous offer of new NPS, which are not controlled by any drug laws.

The EMCDDA describes four issues that contribute to this legal situation (61). The first one is that the newly emerging substances are so novel that there is not much known about their health effects yet. Secondly the process of illegalising substances takes a vast amount of time and therefore gives suppliers the chance to modify an alternative substance. Thirdly the wide definitions in some laws for controlling these substances can be indefinite and therefore it can be difficult to convict the distributors of a crime. And finally, to add a substance to a law, toxicological tests have to be performed, which are not always accessible for the new substances (61).

In consequence of the legal situation NPS could still easily be purchased via the internet in the year 2016. A study by Meyer et al. from 2015 noted that the internet retail stores are most frequently located in the United States, Germany and the UK (62). Additionally the illegal platforms via the so-called ‘Darknet’ are also increasingly used for the distribution and acquisition of these drugs to users and drug dealers, which makes this issue even more diverse (6).

The ‘Darknet’ is a part of the internet where anonymous participation is allowed via advanced encryption, for example on so-called ‘cryptomarkets’ or ‘Darknet markets’ (63). These markets are used for online selling of illicit substances and provide anonymity in respect of the identity of customers and sellers by using different methods to guarantee untraceability (64,65). One famous example of a ‘cryptomarket’ is ‘Silk Road’ (64). The regular internet, as opposed to the ‘Darknet’, is sometimes referred to as ‘Clearnet’ (63).

1.1.4.1 ‘Neue-psychoaktive-Stoffe-Gesetz‘ (NpSG)

In Germany the continuous offer of NPS has led to a new development. To restrict the distribution of these substances in the future an amendment, ‘Neue-psychoaktive-Stoffe-Gesetz’ (NpSG), was approved in Germany in 2016.

The amendment focuses on illegalising whole substance groups namely synthetic cannabinoids and all derivatives of 2-phenethylamine, including synthetic cathinones (66). Figure 3 shows in red the structure of 2-phenethylamine on the example of the synthetic cathinone ephedrone.

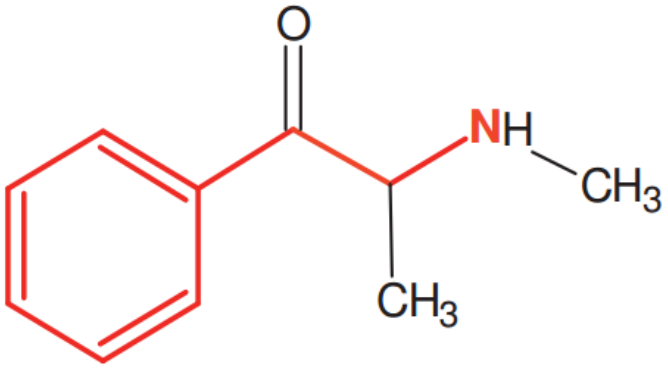

Figure 3: Chemical structure of 2-phenethylamine (red) in ephedrone (methcathinone) (66).

The amendment lists many chemical formulas to give examples of possible derivatives of 2-phenethylamines end synthetic cannabinoids, trying to cover as many substances as possible. Therefore, many NPS are included but not all substances are covered by this amendment.

The range of sentences following this amendment is mainly based on the medicines legislation (Arzneimittelgesetz, AMG) (67). The possession of the included NPS is not prosecutable but the trade and also bringing the substances within the borders of the law are (66). The amendment was approved in September 2016 and inured in late 2016.

NPS can have significant health hazards and are especially popular within the group of adolescents and young adults. Therefore, the aim of the amendment is it to antagonise the further distribution of these drugs and to reduce the availability by stemming the distribution of NPS as alleged legal drugs on the drug market.

1.1.5 Intravenous injection

Nonetheless, the main reasons for the increasing popularity of NPS and synthetic cathinones in particular appear less likely to be rooted within the topic of legality precisely because users often have a history of poly-drug abuse (21).

Instead the motives for users possibly lie within the cost-benefit ratio and the easy availability compared to other stimulant drugs (68,69). Adding to this is the reportedly high addiction potential of synthetic cathinones (33,70). Whereas in the beginning these drugs were mostly used as alternatives for MDMA meanwhile a new trend has emerged, namely the intravenous use of synthetic cathinones.

In a report of the EMCDDA, which was published in 2015, it was noted that injection of synthetic cathinones is mostly seen in high-risk drug users, long-term abstinent ex-opiate users and drug treatment clients (27). High-risk drug use is defined by the EMCDDA as ‘recurrent drug use that is causing actual harms (negative consequences) to the person (including dependence, but also other health, psychological or social problems), or is placing the person at a high probability/risk of suffering such harms’.

A study conducted by Néfau et al. in France in 2012 focussed on the chemical analysis of residues found in syringes in Paris. Néfau et al. reported in their study that 4-MEC was next to heroin, cocaine and benzodiazepines the most commonly observed compound (23 %) in the collected syringes (71).

Van Hout et al. reported in their study from 2012 that over 6 % of their study population of a needle and syringe programme in Ireland had used mephedrone in the preceding 30 days (72).

In Romania a needle and syringe programme located in Bucharest noted in a study of 2012 that of the study population 51 % injected NPS, primarily synthetic cathinones. Furthermore it was noted that 5 % injected a combination of heroin and NPS (27).

The Hungarian National Focal Point reported that the injection of synthetic cathinones among mainly intravenous heroin users was around 58 % in Hungary in 2013 (73).

A small study conducted in Graz, Austria, in 2010 among patients in drug treatment reported that 59 % of these noted to inject mephedrone (74).

But there are also studies regarding the concomitant use of synthetic cathinones in opioid-dependent patients enrolled in opioid maintenance treatment (OMT). This is interesting when looking at the fact that the concomitant use of drugs in general is a commonly reported problem in opioid-dependent patients receiving OMT (75).

A study conducted in Hungary reported the use of synthetic cathinones in opioid-dependent patients in methadone maintenance treatment (MMT) with a rate of involvement between 10 % to 50 % (76).

A study from 2016 carried out in Finland by Heikman et al. focussed on the poly drug use of patients receiving OMT (77). Hereby toxicological urine screens were performed, where 13 % tested positive for NPS. The most commonly detected NPS was alpha-PVP, which was screened in 10 % of the samples.

Regarding the use of synthetic cathinones in Germany a recent study, conducted in 2015 by the Robert-Koch-Institut, focussed, among other topics, on the drug consumption of all injecting drug users in Munich (78). Here 17 % of the injecting drug user population in Munich had used ‘bath salts’ in the preceding 30 days. 54 % of the entire study population were enrolled in OMT. The study did not note how many of the ‘bath salt’ users were enrolled in OMT.

Besides the serious side effects these drugs can have, additional consequences of the intravenous use of synthetic cathinones are vein blockage, soft tissue damage such as cellulitis, abscesses and infection with necrotising fasciitis (35,79). Another important consequence is that, next to the fact that the poly-drug use can have consequences for the treatment retention of patients, the mixing of opioids and stimulants, as synthetic cathinones, comes with high health risks (77). Additionally the injection of synthetic cathinones was recently associated with raised numbers of HIV (human immunodeficiency virus) infections in Hungary (80), Romania (81) and Ireland (82).

1.2 Opioid-dependence

1.2.1 Epidemiology

When looking at the numbers of opioid abusers in Germany, the EMCDDA estimates the population of high risk opioid users with a range from 1.06 to 3.20 per 1,000 inhabitants in the age group of 15 years to 64 years. This equates to a number of 56,200 to 169,400 high risk opioid users in Germany. The EMCDDA assesses these numbers through three different data sources namely drug-related fatalities, contacts with the police, and admissions for medical treatment (83).

1.2.2 Opioid maintenance treatment (OMT)

Nowadays there are several substitution treatment forms for opioid-dependent people in Germany. After heroin was banned as a pharmaceutical in Germany in 1971 and it was introduced shortly after to the illicit drug market, the numbers of heroin addicts increased rapidly (84,85). The first treatment methods were based predominantly on abstinence goals (86). But with the increasing mortality rates and HIV infections in combination with the narrow range of abstinence therapy, the need of maintenance treatment became more and more clear (87).

In Germany MMT was first introduced in 1987 as a model project in North-Rhine Westphalia (88). The maintenance treatment with methadone showed positive results regarding improved health status and reduced criminality (88). Since then more maintenance therapy forms have evolved, but methadone together with levomethadone is still the most frequently used substitution agent (89).

1.2.2.1 Heroin assisted treatment (HAT)

Despite positive results of the MMT, disadvantages showed up as well. Especially concomitant use of illicit drugs and patients dropping out of treatment were frequently seen during maintenance treatment (75,90). Therefore, and due to an epidemic of intravenous use of heroin and HIV infections in Switzerland, heroin assisted treatment (HAT) was first introduced there in 1994 as a research project under the supervision of A. Uchtenhagen (91,92). Hereby patients were prescribed maintenance treatment with diacetylmorphine, also known as pharmaceutical heroin. The study was conducted for patients with a background of chronic heroin dependence and unsuccessful therapies along with severe health issues and problems with social integration. The trial ran for two years and showed positive effects on state of health, mortality numbers and a reduction in delinquent behaviour (93).

In 1998 the Netherlands ensued with a comparable trial, in 2002 Germany and Spain, in 2005 Canada and the UK followed (94–98). Ferri et al. published a revised Cochrane Review in 2011 including studies from six different countries on HAT (99). The review showed advantages of HAT compared to MMT for treatment resistant patients regarding longer treatment retention and less concomitant illicit drug use in general.

Since then more and more studies have analysed the concomitant use of specific substances like cocaine (100), cannabis (96) and benzodiazepines (101) in patients under different OMTs. Results of these studies show that patients treated with HAT have less concomitant use of all of these substances compared to patients under MMT. This effect is reportedly explained due to the fact that methadone shows disadvantages compared to diacetylmorphine in respect of the lack of injection as administration route and the drug-related euphoria (102,103).

The positive outcomes of the studies regarding HAT has led to the development that diacetylmorphine is registered as a medicinal in The Netherlands, Germany, UK, Switzerland and Denmark (104). In these countries HAT is an official OMT.

In Germany HAT was first introduced in seven cities, namely Bonn, Cologne, Frankfurt, Hamburg, Hannover, Karlsruhe and Munich in the year 2002.

The trial ran for four years including a two-year follow-up phase. Since 2009 HAT is an official treatment method and diacetylmorphine may be prescribed again as a medicinal, under strict laws in Germany (105). Nowadays nine cities offer HAT in Germany, namely the seven cities mentioned above and Berlin and Stuttgart (95). In these facilities a total of 725 opioid-dependent patients can be treated with HAT.

Regarding the overall number of patients in OMT in Germany, 77,200 opioid-dependent people were registered in substitution treatment in 2015. Most of these patients were treated with methadone (44.0 %), levomethadone (31.8 %) and buprenorphine (23.0 %). When looking at the numbers of all patients enrolled in OMT, HAT counted for 0.8 % of these in 2015 (106). Other substitution agents, which are proscribed in Germany, are slow release oral morphine (0.1 % in 2015) dihydrocodeine (0.2 % in 2015) and codeine (0.1 % in 2015).

1.2.3 Substitution agents

Diacetylmorphine or pharmaceutical heroin is an opioid agonist. Due to its short half-time it is proscribed two to three times a day (107). This means that patients, who are enrolled in HAT, have to visit the substitution clinic several times every day. Diacetylmorphine is mostly administered via injection, which can be intravenous or not intravenous, also known as supervised injectable heroin (SIH). But also other administration routes are possible. In the Netherlands for example patients, who are enrolled in HAT mainly inhale the prescribed diacetylmorphine. This is due to the fact that in the Netherlands heroin is mainly used by inhalation, also called ‘chasing the dragon’, and that intravenous injection is less widespread as in other countries (94).

Methadone is an opioid agonist which consists of a D- and a L-isomer (108). The L-isomer has a 10 times higher affinity for the opioid receptor (109). It is mostly prescribed orally as a liquid. Due to a long half-time a normal dosage is once per day (110). Levomethadone, also known under the brand name L-Polamidon ®, only consists of the L-isomer. Therefore, levomethadone is ‘double as potent’ as methadone and the dosage is less than that of methadone (108). Methadone and levomethadone do not produce as strong euphoric effects as diacetylmorphine does (111).

Buprenorphine works as a partial opioid agonist and antagonist. This substitution agent is mostly administered sublingually due to a high hepatic first pass effect (110). Buprenorphine dosage is possible between daily or up to every three days. Buprenorphine can also be proscribed in the combination with naloxone, an opioid antagonist. The reason for this combination is to reduce the addiction potential, due to the fact that naloxone inhibits the initial euphoric effects of buprenorphine (108).

Slow release oral morphine (morphine XR) is an opioid agonist. Morphine XR has only recently, namely in 2015, been registered as a substitution agent for OMT in Germany (112). Studies have shown that morphine XR is as effective as methadone as a substitution agent for OMT but with significantly less heroin craving (113–115). It is administered orally and is usually taken in a daily dosage (116).

1.3 Relevance

Regarding the concomitant drug use of all patients enrolled in OMT this topic is especially worrying when looking at the numbers of drug-related deaths. In the year 2015 1,226 drug-related deaths were registered in Germany. This makes up to an increase by 18.8 % compared to 2014, where the number of deaths was 1,032 (54). In the year 2016 an incline by 9 % compared to the year 2015 was registered with a total of 1,333 drug-related deaths (3). Looking at the different federal states the highest number was registered, as in the previous years, in Bavaria. The majority of these deaths were caused by opioids alone or in combination with other substances. Whereas cocaine and benzodiazepines are still the most frequently abused concomitant drugs of patients in OMT, the intravenous concomitant use of synthetic cathinones has evolved, as elucidated, as a recent issue (27).

As noted the deaths due to NPS have increased fourfold in 2016 compared to 2014. Whereas in the year 2014 25 deaths were related to the use of NPS, this number increased to 39 deaths in 2015 and 98 deaths in 2016 (2,3). In reality these numbers are probably higher due to the difficult detectability of these substances (3).

The numbers of deaths regarding NPS and opioids emphasise the relevance of this study, especially when considering the fact that the use of synthetic cathinones is an upcoming drug problem within the population of high-risk drug users and drug treatment clients (27). Synthetic cathinones solely have many side effects and due to the continuous offer of new unknown compounds even more adverse effects, which are still unknown, can occur. Additionally, as pointed out, the mixing of different substances namely opioids with stimulants, as synthetic cathinones are, can cause extra health issues and a higher chance in mortality.

2 Aim of the study

In the literature the intravenous injection of synthetic cathinones especially in high risk drug users and drug treatment clients is reported as a worrying new trend. Considering this and the background and the positive effects of HAT on the concomitant use of illicit drugs, the question arises whether this also applies to the concomitant use of synthetic cathinones. Due to the fact that there is not much known yet in the literature about the use of synthetic cathinones in patients enrolled in OMT in Germany, it is necessary to gain more insight into this topic and to explore factors that could counteract this concerning new development.

Therefore, the aim of this study is to gain more insight into the use of synthetic cathinones in opioid-dependent patients. Furthermore, this study seeks to explore whether differences in use can be detected regarding the various OMTs.

Hence the following issues are targeted:

- How many patients have used ‘bath salts’ before?
- How many patients have used ‘bath salts’ recently?
- In what frequency are patients using these drugs?
- What kind of ‘bath salts’ are being consumed?
- What administration routes are used?
- Where do patients purchase these substances?
- What is the desired effect patients are using them for?
- What are commonly occurring side effects that patients have experienced?
- How often do patients suffer from psychosis?
- What factors contribute to the motivation for using these substances compared to other drugs with the same action spectrum?

The hypothesis regarding differences in use under the various OMTs is that patients, who receive HAT, display less concomitant use of synthetic cathinones compared to patients under other OMT. This hypothesis derives from the fact that HAT has shown in previous studies to have a positive effect on concomitant drug use of other substances in opioid-dependent patients (96,100,101).

3 Method

3.1 Included clinics

This study was conducted as a cross-sectional study to analyse the concomitant use of synthetic cathinones in opioid-dependent patients receiving OMT. The study was set in the substitution clinic ‘N5’ of the Department of Psychiatry and Psychotherapy of the Ludwig-Maximilians-University in Munich.

Throughout the research phase four other substitution clinics in Munich were included. The other facilities included were the substitution clinics ‘Concept’ and ‘Westend’, the doctor’s practice of Dr. J. Al-Iassin as well as the joint doctor’s practice of Dr. med. F. Schäfer and S. Sandow.

The substitution clinic ‘N5’ (Clinic N) offers the whole spectrum of OMT, but is also one of nine clinics in Germany to offer HAT. The clinic has capacity for about 150 patients, whereas 50 of these are enrolled in HAT. The other patients are treated either with levomethadone, buprenorphine, with or without the combination of naloxone, or morphine XR. As part of the Department of Psychiatry and Psychotherapy the clinic focuses on patients with opioid-dependence in combination with psychiatric comorbidity. The clinic also provides psychosocial care via two social workers, from the municipal drug-counselling service, at the facility. Next to the physicians, also an internist is present a few times a week providing additional medical care.

The doctor’s practice ‘Concept’ (Clinic C) offers maintenance therapy combined with general medical care to about 250 opioid-dependent patients. Patients are treated either with levomethadone, buprenorphine, with or without the combination of naloxone, or morphine XR. The clinic provides general medical treatment for the patients. The clinic also provides psychosocial care at the facility with five social workers via different social services providers as ‘Condrobs’ and ‘Extra’. Additionally patients can seek help with sheltered housing schemes at the facility also provided by ‘Condrobs’. Also a psychiatrist is present every few weeks for additional psychiatric care.

The doctor's practice 'Westend' (Clinic W) provides OMT for about 200 opioid-dependent patients. Next to the doctor's practice there is a joint GP's surgery, where patients can seek medical care. The compounds prescribed are methadone, levomethadone and buprenorphine, with or without the combination of naloxone. The clinic offers psychosocial care via one social worker from the clinic itself and two via 'Condrobs'.

The doctor's surgery of Dr. J. Al-Iassin (Clinic A) has coverage for around 150 patients to be enrolled in OMT. Patients are treated with levomethadone, methadone and buprenorphine. Psychosocial care is provided by two social workers via 'Caritas', a social aid organisation, at the facility. Due to the fact that Dr. J. Al-Iassin is a trained surgeon, small surgical procedures can be performed at the practice.

The joint doctor's practice of Dr. med F. Schäfer and S. Sandow (Clinic S) offers OMT and is additionally a GP's surgery. It provides treatment with methadone, levomethadone or burpenorphine for about 150 opioid-dependent patients. Also psychosocial care is provided at the facility by two social workers of the municipal drug-counselling service. The majority of the patients also use the practice for general medical care.

Table 2 gives a summary of the patient capacities and the prescribed compounds of the included substitution clinics.

Table 2: Overview of the included substitution clinics.

Substitution clinic	Number of patients	Compounds prescribed
Clinic N	~ 150	Diacetylmorphine Levomethadone Buprenorphine (+/- Naloxone) Morphine XR
Clinic C	~ 250	Levomethadone Buprenorphine (+/- Naloxone) Morphine XR
Clinic W	~ 200	Methadone Levomethadone Buprenorphine (+/- Naloxone)
Clinic A	~ 150	Methadone Levomethadone Buprenorphine
Clinic S	~ 150	Methadone Levomethadone Buprenorphine (+/- Naloxone)

3.2 Data collection

3.2.1 Questionnaire

3.2.1.1 Data collection instrument

A questionnaire in German language was used to analyse the use of ‘bath salts’ in patients receiving substitution therapy for their opioid addiction. The questionnaire consisted of 18 multiple choice questions, with single or multiple responses as well as open-ended responses.

In the questionnaire the patients had to provide demographic and clinical data (i.e. gender, age, how long they were opioid-dependent for, how long they were in treatment for and what kind of substitution medication they were prescribed). The patients then had to state whether they had ever used ‘bath salts’ before.

If the patients had used ‘bath salts’ before, they were asked about their frequency of use, administration routes, the desired and the adverse effects. For the conduction of the parts of the questionnaire regarding the frequency of the use of ‘bath salts’ and the method of use, questions of the German version of the European Addiction Severity Index (EuropASI) were used as a guideline. The EuropASI is the European adaptation of the Addiction Severity Index and is used as a standardised research instrument regarding basic diagnostic information, including drug use and health status, in patients receiving treatment for drug addiction (117). Therefore, patients were asked how they had consumed these substances, with the options noted in the EuropASI, namely oral, nasal, inhaling, injecting intravenous, injecting not intravenous and, additionally due to the literature, rectal.

Furthermore, the questionnaire focussed on how the patients got hold of the substances and what exact compounds they had used. The full questionnaire is listed in the Appendix (Appendix II).

3.2.1.2 Process of data collection

The questionnaires were handed out in the different facilities as part of clinical routine assessments. The data for this evaluation were acquired during a timeframe of six weeks in May and June of 2016.

The patients filled in the questionnaire at the facilities. The analysis of the data of this questionnaire was irreversibly anonymous and had no consequences for the patients’ treatments. As the questionnaire was conducted in German, patients who spoke German insufficiently had to be excluded.

3.2.1.3 Statistical analysis

For the statistical analysis of the questionnaires IBM SPSS Statistics Version 23.0 was used. Either the chi-squared test or the Fisher's exact test was used to analyse the independence between the use of synthetic cathinones before, respectively the use in the preceding 30 days, and the substitution agents or the substitution clinics. If the contingency table was larger than 2x2, the Fisher-Freeman-Halton exact test of independence was used instead of the Fisher's exact test. Additionally to these tests a post hoc analysis was performed when necessary. The point-biserial correlation was used for analysing the correlation between age and the use of synthetic cathinones before or the use in the preceding 30 days. The significance level was set at $p = 0.05$.

3.2.2 Semi-structured interview

3.2.2.1 Data collection instrument

The interview was conducted within clinical routine as a semi-structured interview and consisted of 18 open questions. The full interview is listed in the Appendix (Appendix III). The aim of the semi-structured interview was to get a more in-depth view on the concomitant use of synthetic cathinones. Therefore, the interview focussed predominately on the motives in using these substances and contributing factors as availability and legality. The data were irreversibly anonymous in terms of evaluation and analyses.

The patients were asked how they first took notice of 'bath salts' and what their motivation was for using these substances, also compared to other drugs with a similar action spectrum. Furthermore, questions were asked about the role of different factors in using these substances, namely price, legality, availability and the internet.

Also, the patients were questioned about what the exact effects of the 'bath salts' were and what side-effects they themselves and other people had experienced. Hereby the occurrence of psychotic symptoms was asked in particular. If patients had quitted the use of 'bath salts' they were asked about the reasons for this.

Other topics, included in the interview, were:

- What is the perception of ‘bath salts’ in the drug scene?
- On what occasions are these substances consumed?
- Are pure or mixed compounds used?
- What information is provided by dealers?
- Do patients buy these substances ahead?

3.2.2.2 Process of data collection

If the patients were willing to participate in the personal interview they could state their name in the questionnaire. After the distribution phase and the elaboration of the questionnaires, these patients were contacted, either by the interviewer, or through the respective facilities, which then made appointments with the subjects.

The personal interviews were performed in the respective facilities in a time frame of four weeks in June of 2016. The data used for the analyses were handled anonymously.

Before the interview started, all questions of the questionnaire were reviewed with the patients. Additionally the patients were asked whether they had used ‘bath salts’ in the preceding 30 days of the interview. Due to the fact that the interview was semi-structured it followed a structure, but the interviewer could ask ad hoc questions when needed.

3.2.2.3 Qualitative content analysis

The recorded interviews were transcribed into Microsoft Word. The documents were then uploaded in QDA Miner Lite to analyse the interview data and to underwrite the comprehensibility of the analysis (118). QDA Miner Lite is a limited version of the QDA Miner Software. It is used for analysing and coding small or large collections of qualitative data, for example interviews or focus group transcripts.

It can also be used for analysing visual documents, for example photographs, but this was not necessary for this study. Due to the fact that QDA Miner Lite is a limited version of the full version of QDA Miner it misses some advanced features but the most essential features for coding a document are still included (119).

For the analysis of the interviews the method of qualitative content analysis by Mayring was used as a guideline (120). Qualitative content analysis is used for analysing for example interviews or transcripts systematically. This method was developed by Mayring and combines qualitative and quantitative content analysis with a procedure of either developing deductive or inductive categories.

Deductive categories are derived beforehand, based on the theoretical background and are then applied to the interview data. With inductive category application, categories are formed on the basis of the interview data. For this study the inductive category analysis was used.

The idea of the inductive category development is that, with the background and the aim of the study in mind, the important aspects of the derived interview data can be taken into account. During this process the material is worked through and categories are gradually derived. Afterwards these categories are reviewed, also paying attention to the reliability of these categories, with as the final step to create main categories (121). Figure 4 shows a step model of this exact process.

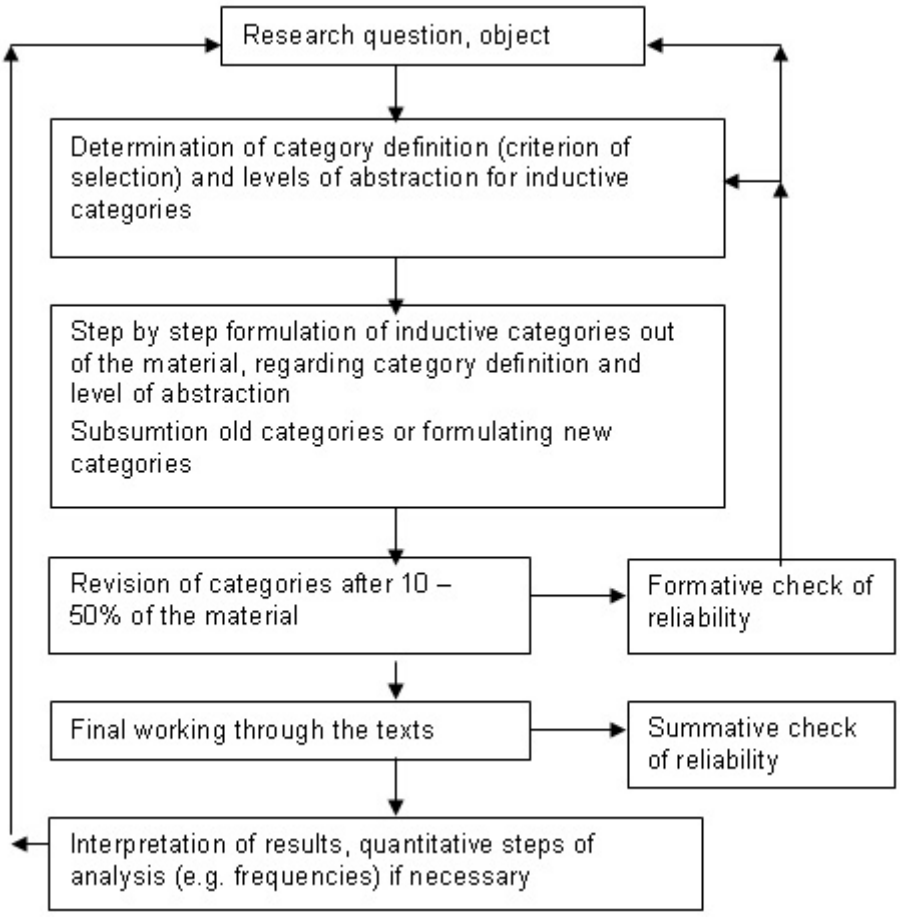

Figure 4: Step model of inductive category development as described by Mayring (122).

Mayring also describes that quantitative aspects of the qualitative data can be analysed. Concretely this means exploring the quantitative aspects by analysing the frequencies of the different categories, thus the number of patients that stated a specific topic (120). In this study the quantification of the categories was performed. This was possible due to the fact, that the interview was semi-structured and therefore followed a standard of questions.

Regarding the ethical considerations, the study and the analyses of the data were in line with these. The data were comprised of routine assessments regarding concomitant use of psychoactive agents, which are part of safety requirements in patients under opioid maintenance treatment. The analyses of patients' reports were strictly anonymous. This procedure is in line with and has been approved by the Ethics Committee of the Medical Faculty of the University of Munich.

4 Results

4.1 Questionnaires

In total 350 questionnaires were collected. This is a response rate of approximately 39 % of the total number of patients, which is about 900 patients.

Three questionnaires were excluded because the exact substances specified in the questionnaire were not synthetic cathinones but other NPS, namely 2C-E, 'Yaba' and 4F-MPH. 2C-E is one of the synthetic phenethylamines of the 2C-series. 'Yaba' is an Asian equivalent for a form of methamphetamine and therefore has stimulant effects (123). It usually contains methamphetamine and caffeine and is sold in a tablet form (124). 4F-MPH (4-Fluoromethylphenidate) is a close analogue of methylphenidate and has not emerged on the drug market until recently. It has comparable effects to methylphenidate and therefore works as a stimulant (125).

Of the included 347 patients, four had used, besides specific synthetic cathinones, other substances namely, 4F-MPH, 2-FA, 2C-E and 2C-B. 2-FA (2-Fluoramphetamine) is a phenethylamine and works as stimulant with performance-enhancing effects (126). The four questionnaires were not excluded, due to the fact that the patients, who named these substances, also had used synthetic cathinones and these compounds were noted in the questionnaires as well.

4.1.1 Population characteristics

4.1.1.1 Substitution agents

Table 3 shows an overview of the frequency of the different substitution agents used in the various substitution clinics. Of the 347 included patients 33 (9.5 %) were enrolled in HAT.

The majority of the patients, namely 74.1 %, were prescribed levomethadone or methadone. Buprenorphine, with or without the combination of naloxone, was prescribed to 46 patients (13.3 %). Morphine XR was only administered in two clinics, namely Clinic N and Clinic C. This is due to the fact that morphine XR is a relatively new compound. Therefore, of all included patients, only eleven patients (3.2 %) received morphine XR as their substitution agent.

Table 3: Overview of the different substitution agents among the various substitution clinics.

	Overall (n= 347)	Diacetyl-morphine (n= 33)	(Levo-) Methadone (n= 257)	Buprenorphine (+/-Naloxone) (n= 46)	Morphine XR (n= 11)
Substitution Clinic - n (%)					
Clinic N	94 (27.1)	33 (100)	47 (18.3)	10 (21.7)	4 (36.4)
Clinic C	96 (27.7)	0	63 (24.5)	26 (56.5)	7 (63.6)
Clinic W	51 (14.7)	0	46 (17.9)	5 (10.9)	0
Clinic A	49 (14.1)	0	47 (18.3)	2 (4.3)	0
Clinic S	57 (16.4)	0	54 (21.0)	3 (6.5)	0

4.1.1.2 Age

Table 4 shows an overview of the mean age of the patients regarding the different substitution agents. Also an overview is given of the mean numbers of years how long patients have been opioid-dependent for and how long they were in substitution treatment for.

Table 4: Overview of the age, duration of opioid-dependence, duration of treatment enrolment.

	Overall (n= 347)	Diacetyl-morphine (n= 33)	(Levo-) Methadone (n= 257)	Buprenorphine (+/-Naloxone) (n= 46)	Morphine XR (n= 11)
Age, years - Mean (SD)	40.8 (8.7)	41.0 (8.2)	40.9 (8.8)	41.3 (9.0)	36.9 (8.9)
Opioid-dependent, years - Mean (SD)	19.6 (8.6)	20.7 (8.5)	19.7 (8.8)	18.8 (8.0)	15.6 (6.6)
In treatment, years - Mean (SD)	9.7 (6.8)	9.3 (7.6)	10.0 (7.0)	8.6 (5.6)	6.9 (6.4)

The oldest patient in the diacetylmorphine group was 58 years and the youngest 25 years. In the levomethadone and methadone group the age ranged from 22 years to 67 years. The patients treated with buprenorphine were aged between 24 years and 62 years and in the extended release morphine group between 25 years and 58 years. Figure 5 shows as a box plot the age distribution regarding the different substitution agents.

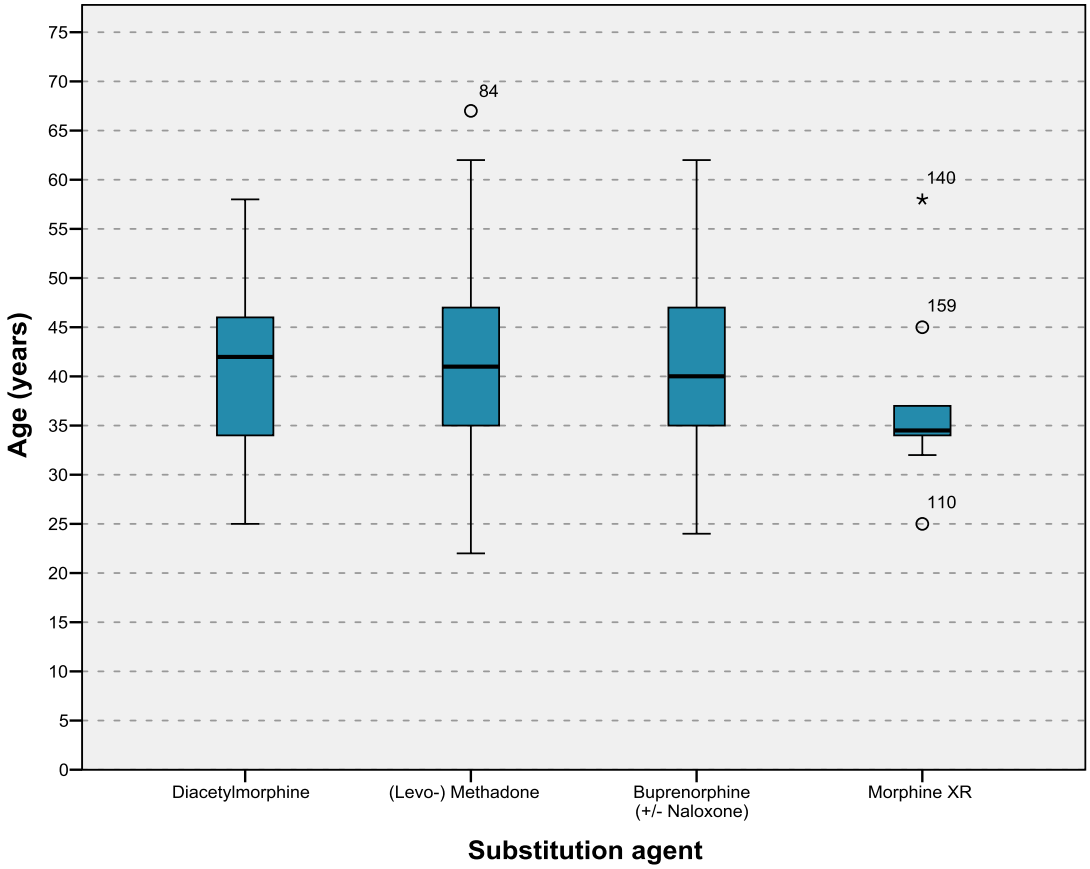

Figure 5: Box plot showing the mean age of patients in respect of the different substitution agents.

4.1.1.3 Gender

Table 5 shows an overview of the gender distribution regarding the different substitution agents. The overall gender distribution was 32.6 % female and 66.9 % male. This coincides with the general gender distribution of the patients enrolled in the clinics, which is mostly one third female and two third male.

Table 5: Overview of the gender distribution regarding the different substitution agents.

	Overall (n= 347)	Diacetyl-morphine (n= 33)	(Levo-) Methadone (n= 257)	Buprenorphine (+/-Naloxone) (n= 46)	Morphine XR (n= 11)
Gender - n (%)					
Female	113 (32.6)	8 (24.2)	86 (33.5)	17 (37.0)	2 (18.2)
Male	232 (66.9)	25 (75.8)	170 (66.1)	29 (63.0)	8 (72.7)
Missing	2	0	1 (0.4)	0	1 (9.1)

4.1.2 Use of synthetic cathinones

In total 123 patients (35.4 %) stated to have used ‘bath salts’ before. 32 (26.0 %) of these had used ‘bath salts’ in the preceding 30 days, at the time of filling in the questionnaire, which counts for 9.2 % of all included patients.

4.1.2.1 Age

The mean age of patients that had used ‘bath salts’ before was 37.9 years compared to 42.4 years regarding patients that had not used ‘bath salts’ before. The youngest patient, which had used ‘bath salts’ before, was 22 years of age and the oldest patient was 58 years. Of the patients that had not used ‘bath salts’ before the youngest was 23 years of age and the oldest was 62 years. The age of the patients showed a significant negative correlation with the use of ‘bath salts’ before (p<0.01). Figure 6 shows as a box plot the comparison of the age of the patients that had used synthetic cathinones before and the age of the patients that had not used synthetic cathinones before.

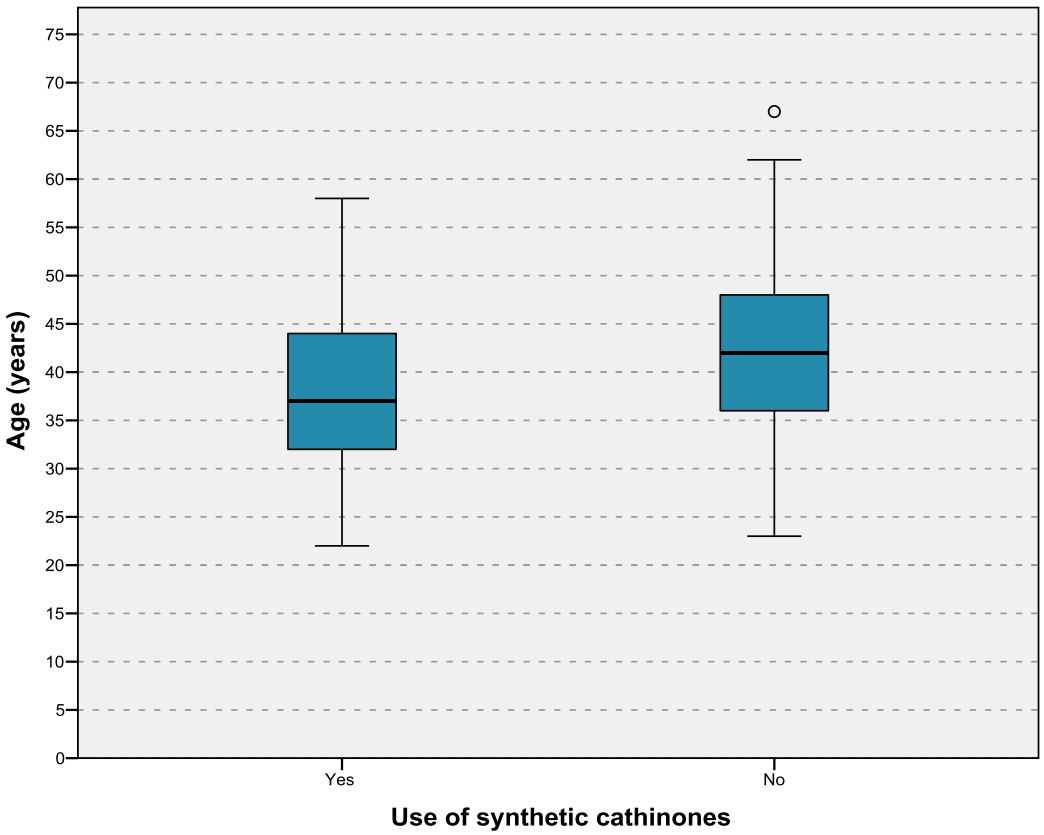

Figure 6: Box plot showing the comparison of the age between the patients who have used ‘bath salts’ before and the patients who have not used ‘bath salts’ before.

The mean age of patients that had used ‘bath salts’ in the preceding 30 days was 35.9 years compared to the mean age of 40.2 years of the subjects that had not used ‘bath salts’ in the preceding 30 days. This also had a significant negative correlation (p=0.01).

4.1.2.2 Gender

Figure 7 shows the comparison of male and female patients in respect to whether they had used ‘bath salts’ before or not. Of the female patients 30.6 % had used ‘bath salts’ before and 69.4 % had not used ‘bath salts’ before. Respectively of the male patients 31.3 % had used ‘bath salts’ before and 68.7 % had not used these before. A chi-squared test showed no significant difference regarding the gender and the use of ‘bath salts’ before (p=0.68).

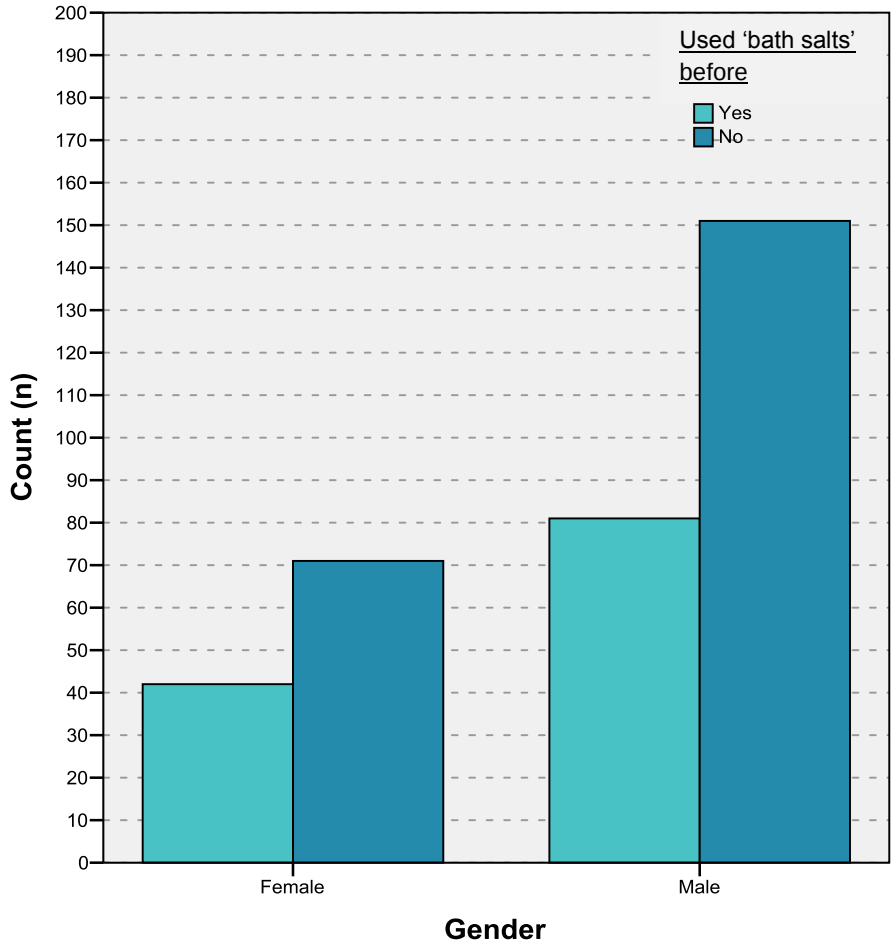

Figure 7: Comparison of gender regarding the use of 'bath salts' before.

4.1.2.3 Substitution clinics

Regarding the substitution clinics the percentage of patients that had used 'bath salts' before was in Clinic A the highest with 40.8 % and in Clinic C the lowest with 30.2 %. In respect of the use in the preceding 30 days the percentage was the highest in Clinic C (11.5 %) and the lowest in Clinic W (5.9 %). Table 6 gives an overview of the exact numbers.

Table 6: Overview of the use of ‘bath salts’ among the different substitution clinics.

	Clinic N (n= 94)	Clinic C (n= 96)	Clinic W (n= 51)	Clinic A (n= 49)	Clinic S (n= 57)
Use of ‘bath salts’ before - n (%)					
Yes	35 (37.2)	29 (30.2)	20 (39.2)	20 (40.8)	19 (33.3)
No	59 (62.8)	67 (69.8)	31 (60.8)	29 (59.2)	38 (66.7)
Used in preceding 30 days - n (%)	6 (6.4)	11 (11.5)	3 (5.9)	6 (12.2)	6 (10.5)

A chi-squared test showed no significant difference regarding the number of patients who had used ‘bath salts’ before among the five substitution clinics (p=0.68). Also no significant difference was found in respect of patients who had used ‘bath salts’ in the preceding 30 days among the substitution clinics (p=0.68).

4.1.2.4 Substitution agents

The previous use of ‘bath salts’ was the highest in the group of patients receiving buprenorphine, with or without the combination of naloxone, as a substitution agent (41.3 %). The lowest percentage was in the group of patients receiving morphine XR, namely 27.3 %. Of the patients enrolled in HAT 39.4 % had used synthetic cathinones before whereas of the patients treated with methadone or levomethadone this percentage was 34.2 %. A chi-squared test showed no significant difference between the various substitution agents regarding the use of ‘bath salts’ before (p=0.72).

Regarding the use in the preceding 30 days, the highest percentage was in the group of patients receiving buprenorphine, with or without the combination of naloxone, namely 10.9 %. The lowest number of users was in the group of patients being treated with morphine XR, where no patient had used synthetic cathinones in the preceding 30 days.

In the diacetylmorphine group two patients had used ‘bath salts’ in the preceding 30 days which counts for 6.1 % of this group. 9.7 % of the patients in the levomethadone and methadone group had used ‘bath salts’ in the preceding 30 days. A Fisher-Freeman-Halton exact test showed no significant difference between the substitution agents regarding the use in the preceding 30 days (p=0.49). Table 7 gives an overview of the exact numbers and percentages.

Table 7: Overview of the use of ‘bath salts’ regarding the different substitution agents.

	Overall (n= 347)	Diacetyl-morphine (n= 33)	(Levo-) Methadone (n= 257)	Buprenorphine (+/-Naloxone) (n= 46)	Morphine XR (n= 11)
Use of ‘bath salts’ before - n (%)					
Yes	123 (35.4)	13 (39.4)	88 (34.2)	19 (41.3)	3 (27.3)
No	224 (64.6)	20 (60.6)	169 (65.8)	27 (58.7)	8 (72.7)
Used in preceding 30 days - n (%)	32 (9.2)	2 (6.1)	25 (9.7)	5 (10.9)	0

4.1.2.5 Frequency of use

Regarding the frequency of use the patients could choose between three categories in the questionnaire, namely rarely or once, occasionally or regularly. Of the patients, that had used ‘bath salts’ before, 9.8 % stated to use these on a regular basis. Furthermore 20.3 % stated an occasional frequency. The majority of the patients (61.8 %) stated to use ‘bath salts’ rarely or to have used these once only. The remaining 8.1 % of the patients did not fill in this question. Figure 8 shows an overview of the frequencies of the different categories the patients had stated, regarding their frequency of use, as a bar graph.

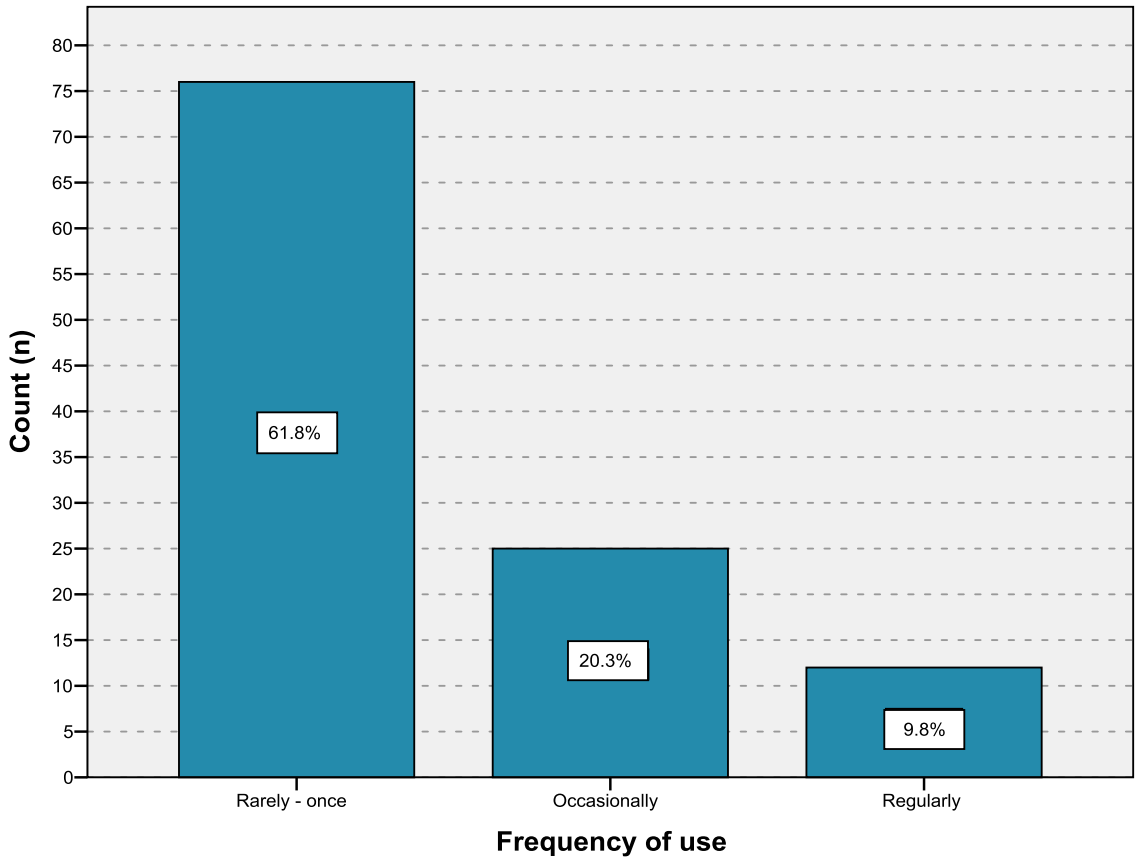

Figure 8: Overview of the frequency of use patterns.

Of the patients that stated to use ‘bath salts’ regularly, eight (72.7 %) had used ‘bath salts’ in the preceding 30 days. In the group of patients that stated an occasional frequency, fourteen (66.6 %) of these had used ‘bath salts’ in the preceding 30 days. And regarding the patients that had used synthetic cathinones rarely or once, nine (13.6 %) had used the substances in the preceding 30 days. Table 8 gives a complete overview of the numbers of patients per frequency that had used or not used ‘bath salts’ in the preceding 30 days. The overall number of 98 derives from the fact that remaining patients either did not fill in the question about the frequency or did not note the use in the preceding 30 days.

Table 8. Overview of the use in the preceding 30 days regarding the stated frequency of use.

	Overall (n= 98)	Rarely/once (n= 66)	Occasionally (n= 21)	Regularly (n= 11)
Used in preceding 30 days - n (%)				
Yes	31 (31.6)	9 (13.6)	14 (66.7)	8 (72.7)
No	67 (68.4)	57 (86.4)	7 (33.3)	3 (27.3)

Regarding the frequency of use and the different substitution agents, one patient enrolled in HAT (7.7 %) used ‘bath salts’ on a regular or occasional basis. In the (levo-) methadone group 31 patients and therefore 39.2 % used ‘bath salts’ regularly or occasionally. Of the patients treated with buprenorphine five (27.8 %) used these substances regularly or occasionally. Of the patients being treated with extended-release morphine none stated to use ‘bath salts’ on a regular or occasional basis.

A Fisher-Freeman-Halton exact test showed a statistical trend (p=0.07) with respect to the frequency of use within the different substitution agents. For this test the groups of patients that stated an occasional or regular basis of use were combined in one group. This was done due to the fact that the percentages of patients, that had used ‘bath salts’ in the preceding 30 days, were comparable in these groups. A post hoc analysis showed that the found trend referred to lower frequency of ‘bath salt’ use in patients treated with diacetylmorphine and higher frequency in patients receiving (levo-) methadone.

Figure 9 gives a visual presentation of these numbers as a bar graph whereas Table 9 gives an overview of the exact numbers.

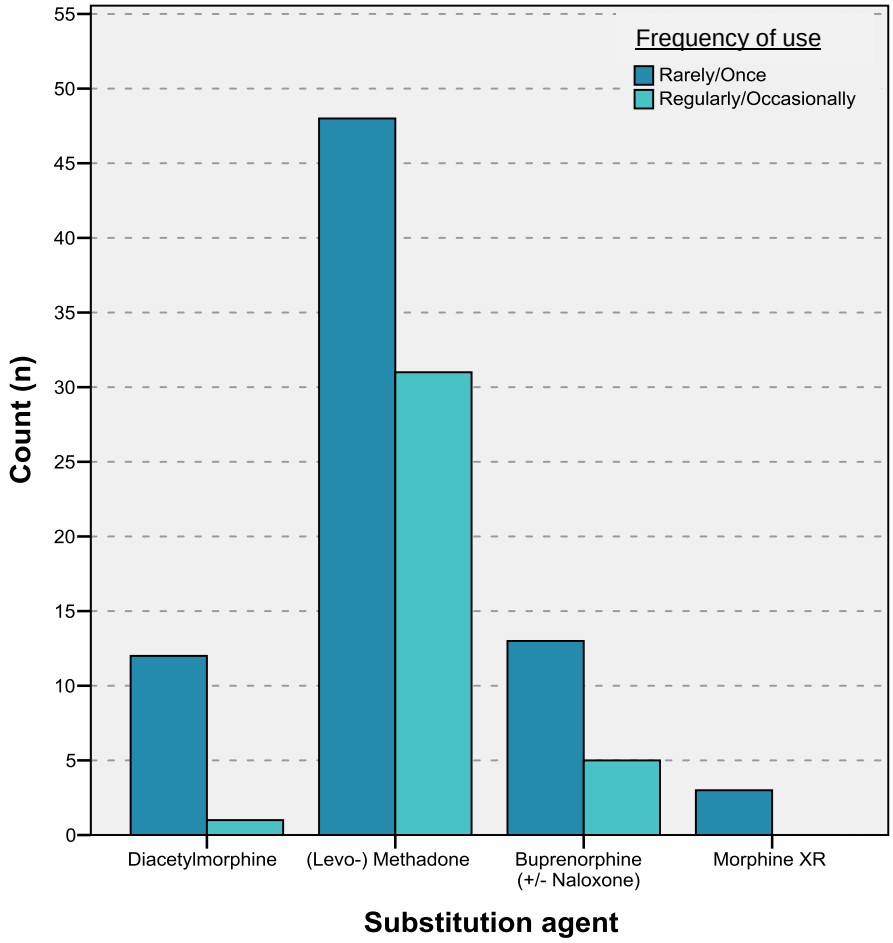

Figure 9: Frequency of the use of 'bath salts' on the basis of the different substitution agents.

Table 9: Overview of the frequency of use regarding the different substitution agents.

	Overall (n= 113)	Diacetyl-morphine (n= 13)	(Levo-) Methadone (n= 79)	Buprenorphine (+/-Naloxone) (n= 18)	Morphine XR (n= 3)
Rarely/once - n (%)	76 (67.3)	12 (92.3)	48 (60.8)	13 (72.2)	3 (100.0)
Regularly/occasionally - n (%)	37 (32.7)	1 (7.7)	31 (39.2)	5 (27.8)	0 (0.0)

4.1.2.6 Administration routes

The majority of the patients, namely 61.0 %, reported intravenous injection as the most used route of administration. Nasal administration was used by 10.6 % as the most frequent method. Five patients (4.1 %) reported non-intravenous injection and oral administration and inhaling were each used by two patients (1.6 %) most commonly. Table 10 gives an overview of the numbers regarding the most frequently used routes of administration.

Table 10: Overview of the different routes of administration.

Route of administration	n (%)
Oral	2 (1.6)
Nasal	13 (10.6)
Inhaling	2 (1.6)
Injecting not i.v.	5 (4.1)
Injecting i.v.	75 (61.0)
Stated more than one method	14 (11.4)
Missing	12 (9.8)

The question regarding the route of administration was generated as a single response question, namely what route of administration was used most frequently. Fourteen patients stated more than one method of use. The majority of these had used ‘bath salts’ nasally, by intravenous injection or orally. Five patients had used the ‘bath salts’ by inhaling. Two patients had stated to have used these rectally before. An overview of the used administration routes of patients, who stated more than one method, is shown in Figure 10 as a bar graph.

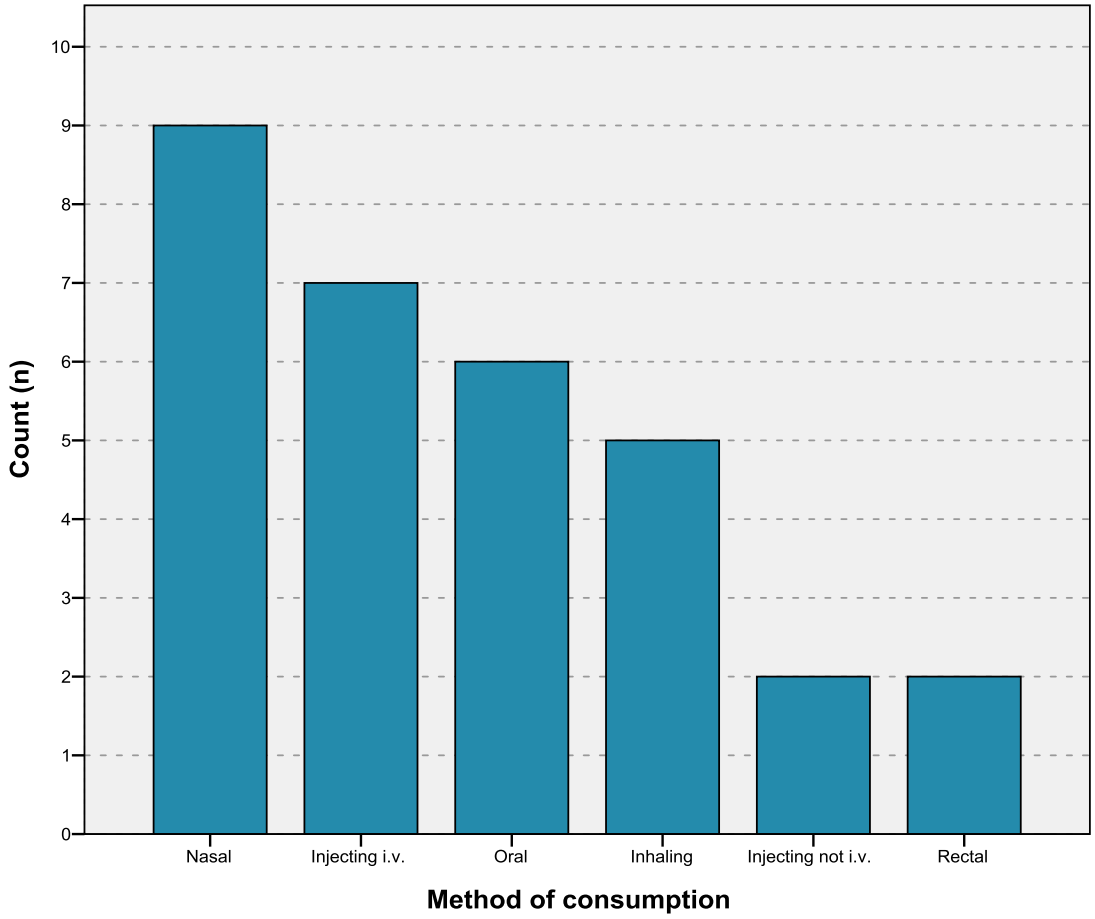

Figure 10: Overview of the methods of use of the patients stating more than one method.

4.1.2.7 Acquisition

In total 43.2 % of the patients stated to have acquired the substances via acquaintances or friends. 32.6 % purchased the substances from a drug-dealer and 24.2 % via the internet. The majority of the patients that stated a regular use of ‘bath salts’ purchased these on the internet (62.5 %). 25.0 % of the regular users purchased the substances via a drug-dealer and 12.5 % via acquaintances or friends. Of the patients that used ‘bath salts’ occasionally 38.7 % purchased the substances via acquaintances or friends. 35.5 % acquired the substances via a drug-dealer and 25.8 % via the internet. Of the group of patients that use ‘bath salts’ only rarely or once the majority (51.3 %) purchased these via acquaintances or friends. 33.8 % of these patients purchased from a drug-dealer and 15.0 % bought the substances via the internet.

Figure 11 shows an overview of where the patients purchased the substances regarding the different frequencies of use. Due to the fact that some patients noted more than one acquisition route the total count is higher than the number of patients.

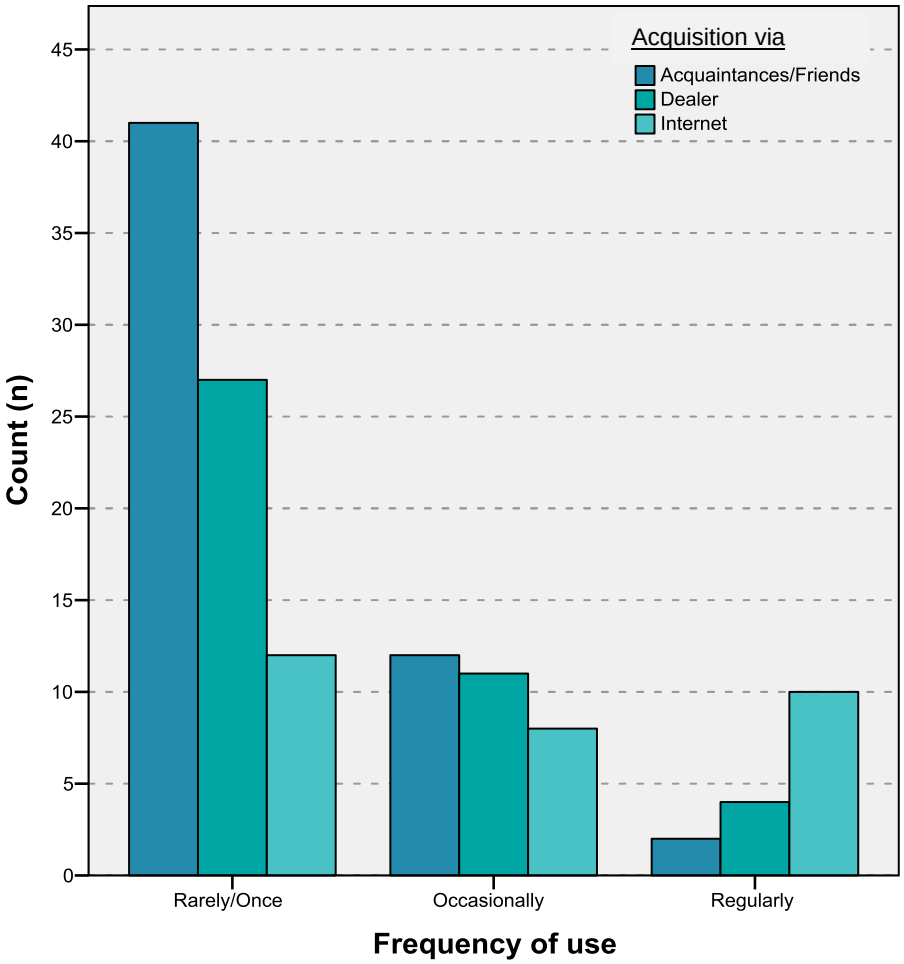

Figure 11: Overview of the different acquisition possibilities in respect of the frequency of use.

4.1.2.8 Desired effect

Patients could state in the questionnaire what the desired effect for them was when using ‘bath salts’. The desired effect was kick or euphoria for 81.3 % of the patients and calming or sedation for 0.8 %. The remaining 17.9 % of the patients did not fill in this question.

Three patients stated next to the desired effect of kick or euphoria additional desired effects, such as ‘sexually stimulating’, ‘mania for cleaning’ and ‘a psychedelic effect’ or ‘a psychotropic effect’.

4.1.2.9 Used compounds

Figure 12 shows an overview of the exact synthetic cathinones the subjects had used. 30.9 % of the patients that had used ‘bath salts’ before stated that at least one of the compounds they had used was unknown to them. The question, regarding the exact used compounds, was generated as a multiple response question. Therefore, patients could name more than one compound. Only compounds used by more than three patients are included in Figure 12.

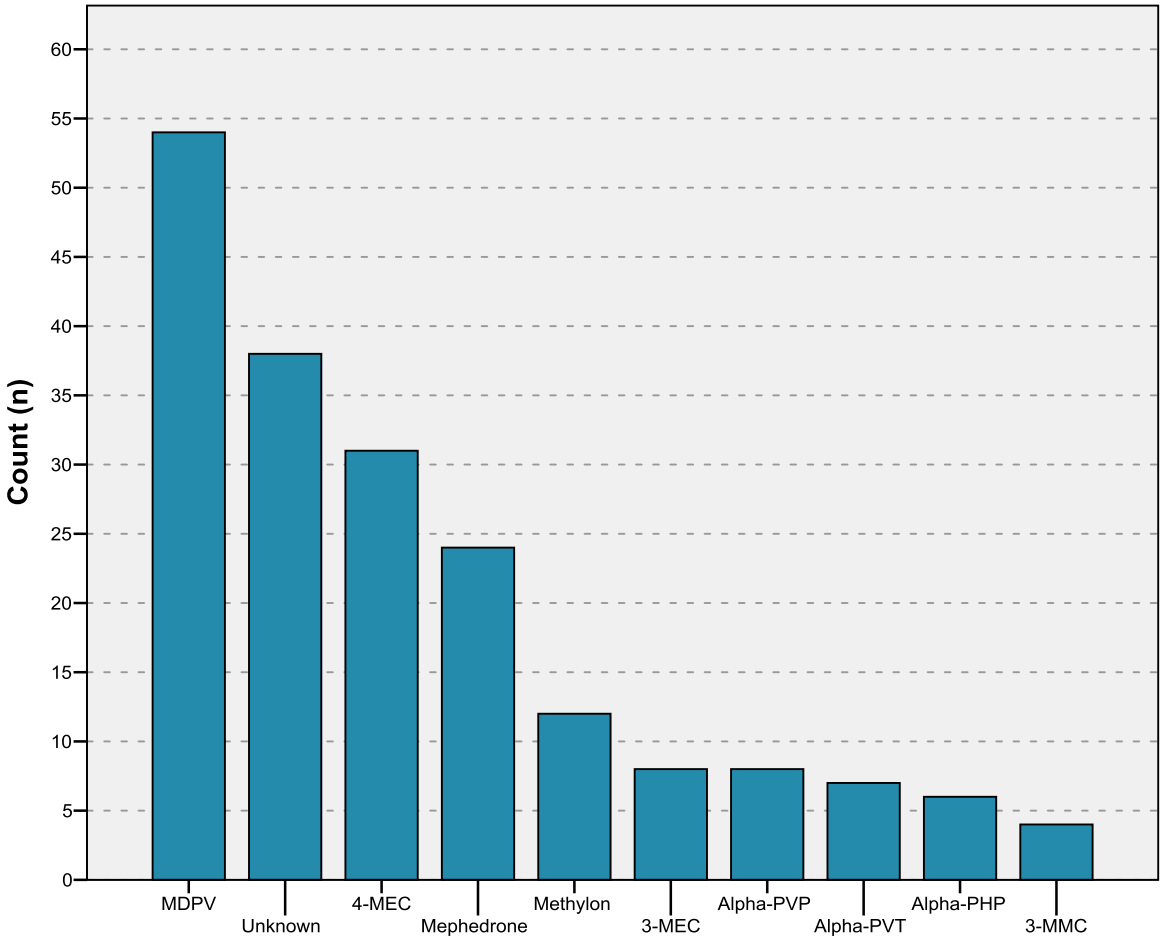

Figure 12: Exact compounds that were used as stated by the patients.

Other compounds, used by three patients or less, are listed in Table 11. The table shows how many patients used the compound, what compound they stated and what the other names and the IUPAC name of these compounds are.

Table 11: Overview of other synthetic cathinones that were used.

Number of patients	Compound stated	Other names *IUPAC name*
n= 3	PV8	Alpha-PHpP α-PHpP α-Pyrrolidinoheptiophenone *1-phenyl-2-(pyrrolidin-1-yl)heptan-1-one*
n= 2	A-PBP	α-Pyrrolidinobutiophenone *1-phenyl-2-(1-pyrrolidinyl)butan-1-one*
n= 2	3-CMC	Chloredone 3-Chlormethcathinon *1-(3-chlorophenyl)-2-(methylamino)propan-1-one*
n= 1	4F-PV8	4F-Alpha-PHpP 4-F-α-PHpP 4-fluoro-α-Pyrrolidinoheptiophenone *1-(4-fluorophenyl)-2-(pyrrolidin-1-yl)heptan-1-one*
n= 1	4F-PVP	4-F-α-PVP 4-fluoro-α-Pyrrolidinopentiophenone *1-(4-fluorophenyl)-2-(pyrrolidin-1-yl)pentan-1-one*
n= 1	BK-MDEA	βK-MDEA Ethylone 3,4-methylenedioxy-N-ethylcathinone *1-(1,3-Benzodioxol-5-yl)-2-(ethylamino)propan-1-one*

4.1.2.10 Side effects

Side effects were experienced by 64.2 % of the patients who had used ‘bath salts’ before. If patients had experienced side effects they could state in an open answer what kind of side effects had occurred. Figure 13 shows the most commonly reported side effects as stated in the questionnaires. The percentages shown in the figure refer to the percentage of the patients that had experienced side effects before. In total 33.0 % of the patients, who reported side effects, suffered from psychotic symptoms, namely either from delusions or hallucinations solely, or from psychosis, a thought disorder with ‘loss of contact with reality’ with a combination of symptoms such as delusions and hallucinations. Other side effects that were reported are listed in Table 12.

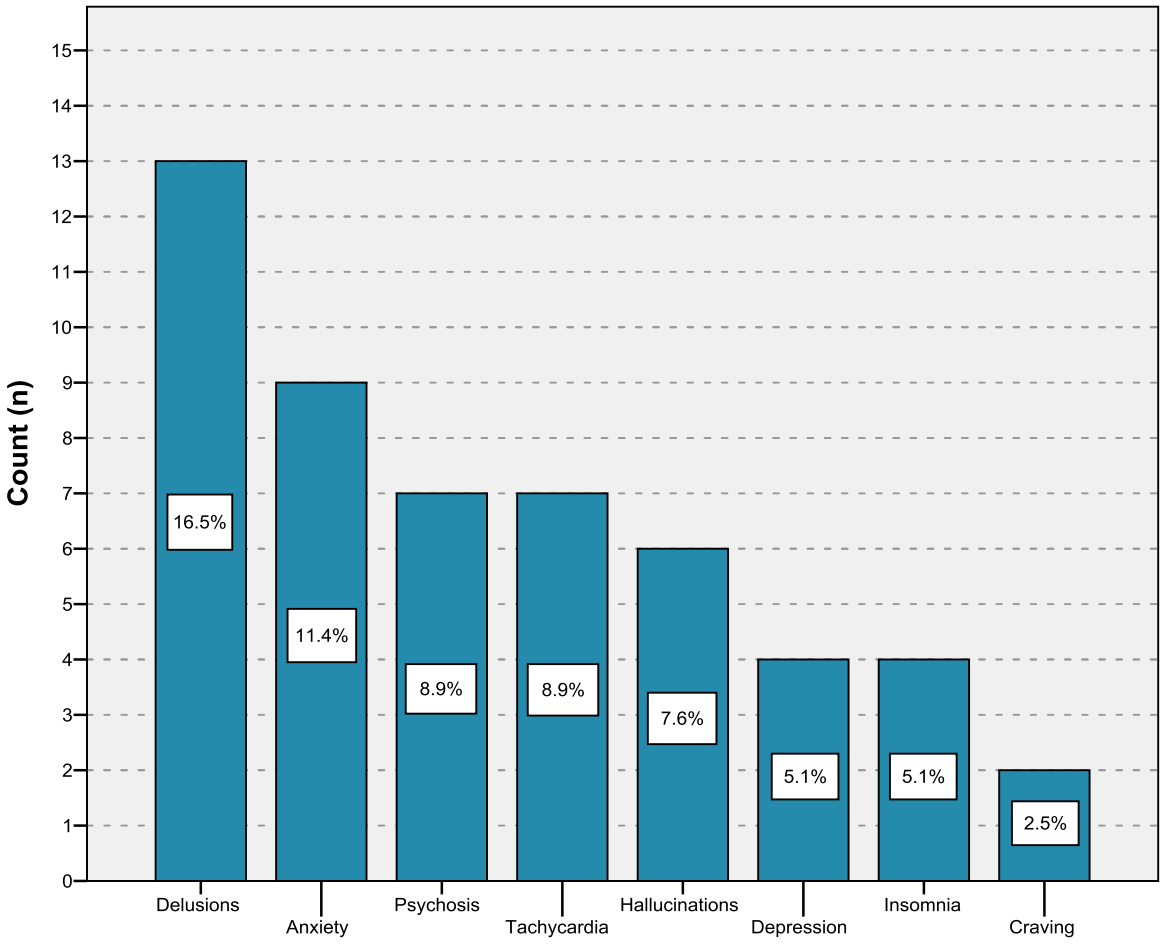

Figure 13: Most commonly reported side effects.

Table 12: Other specified side effects.

Number of patients	Side effect
n=2	Edema
n=1	Necrosis
n=1	Abscess
n=1	Clogged veins
n=1	Spasm
n=1	Renal congestion

Furthermore, two patients noted to have suffered from serious side effects following the use of ‘bath salts’. One of these patients experienced epileptic seizures. The other patient suffered from sepsis, multiple minor strokes, a cardiac valve endocarditis and a renal as well as a splenic infarct. The cardiac valve endocarditis resulted in a cardiac valve replacement surgery.

4.2 Semi-structured interviews

The included patients could note in the questionnaire whether they would participate in a more detailed personal interview about ‘bath salts’. Of the 347 patients 24 volunteered for the interview. These were eight patients from Clinic N, three patients from Clinic C, five patients from Clinic W, five patients from Clinic A and three patients from Clinic S. Ultimately 15 interviews were carried out. Six patients of Clinic N, one patient of Clinic C, two patients of clinic W, three patients of Clinic A and three patients of Clinic S participated. Of the nine interviews that were not carried out, four patients did not want to participate anymore, three were stationary and one was no longer enrolled in maintenance treatment.

Of the participating patients six were female and nine were male. Three patients had noted in their questionnaire that they had used ‘bath salts’ regularly and two patients stated to have used these substances on an occasional basis. Four patients reported use in the preceding 30 days during the time of filling in the questionnaire. At the time of the interview three of these patients stated use in the prior 30 days to the interview. Additionally one patient, who had not used ‘bath salts’ in the preceding 30 days at the time of the questionnaire, reported use in the preceding 30 days at the time of the interview.

Table 13 gives an overview of the 15 patients that participated in the semi-structured interview. The 15 patients are each represented by an ID number from 1 to 15. The table shows the demographic data, namely age and gender, also the substitution agent and the frequency of use as stated in the questionnaire. Furthermore the table shows whether the patients had used synthetic cathinones in the 30 days previous to the questionnaire and in the 30 days previous to the interview. The number in brackets refers to the number of days that the patient had used 'bath salts' regarding the respective 30 days.

Table 13: Overview of the patients which participated in the semi-structured interview.

ID	Age	Gender	Substitution Agent	Frequency as stated in questionnaire	Used preceding 30 days at time of questionnaire (n days)	Used preceding 30 days at time of interview (n days)
1	39	Female	Diacetylmorphine	Rarely/once	No	No
2	31	Male	Diacetylmorphine	Rarely/once	Yes (1)	No
3	48	Male	Diacetylmorphine	Rarely/once	No	No
4	25	Female	Diacetylmorphine	Rarely/once	No	No
5	29	Male	Diacetylmorphine	Rarely/once	No	No
6	37	Male	Levomethadone	Rarely/once	No	No
7	35	Male	Levomethadone	Regularly	Yes (14)	Yes (10)
8	44	Male	Levomethadone	Occasionally	No	Yes (3)
9	25	Female	Methadone	-	No	No
10	43	Male	Methadone	Regularly	Yes (1)	Yes (30)
11	41	Female	Levomethadone	Rarely/once	No	No
12	49	Male	Methadone	Occasionally	Yes (5)	Yes (+/- 30)
13	46	Male	Methadone	Rarely/once	No	No
14	27	Female	Levomethadone	Regularly	No	No
15	31	Female	Levomethadone	Rarely/once	No	No

For the references regarding the citations in this section, these are coded with, first the number of the ID (x) followed by the number of the citation of the particular patient (y). Therefore, the citations are summed up as [x-y]. The citations are listed per patient ID in Appendix IV.

4.2.1 Main issues

Three main issues derived from the qualitative content analysis of the semi-structured interviews, namely the reasons for use, the topic of internet and legality and the risks and side effects. The issues were coded in the following categories and subcategories:

- Reasons for use
    - Price
    - Effect
    - Availability

- Internet and legality
    - Acquisition via internet
    - Legality
    - ‘Darknet’ vs. regular internet

- Risks and side effects
    - Psychotic symptoms
    - Addiction potential
    - Poly-drug use

4.2.1.1 Reasons for use

Price

In the interview patients were asked about the importance of different factors for their motivation for using ‘bath salts’. Of the 15 interviewed patients 13 reported that the price of ‘bath salts’ plays an important role when consuming these substances [1-01, 2-01, 4-01, 5-01, 6-01, 7-01, 9-01, 10-01, 11-01, 12-01, 13-01, 14-01, 15-01]. These 13 patients noted that ‘bath salts’ are much cheaper than other drugs with a similar effect.

A concrete price of synthetic cathinones was mentioned by five patients. The prices ranged between around 20 Euros for one gram [1-02], 30 Euros per gram [13-02], 109 Euros for five grams [7-02], 100 Euros for five grams [9-02] and 180 Euros for ten grams [6-02]. Additionally two patients noted that if you order the ‘bath salts’ on the internet the policy is that the more you order, the cheaper it gets [14-02, 15-02].

One patient explained that for him the price does not play a role, because ‘bath salts’ are more expensive nowadays than cocaine. But he further noted that if you order on the internet you will make a lot of money from it [8-01]. One patient explicitly mentioned that the cost-benefit ratio of ‘bath salts’ was extremely good [5-01].

Effect

The effects of synthetic cathinones were an important factor for nine patients, when consuming these substances [1-03, 3-01, 4-02, 6-03, 8-02, 10-02, 11-01, 12-02, 15-03]. Overall these patients described ‘bath salts’ as drugs with strong euphoric effects.

One patient noted that ‘baths salts’ had an effect 60 times stronger than cocaine [10-02]. Also two patients noted that for them ‘bath salts’ made them ‘still feel something’ in comparison to other drugs, of which the effects are not that strong [11-01, 12-03]. One of these patients noted in particular that this effect was still present during OMT and that he normally does not feel these intense effects with other drugs [12-03]. Overall the euphoria was reportedly more intense than with all other stimulants that patients had used before.

One patient described that she never felt such an intense happiness as when she had used ‘bath salts’ [4-02]. Two other patients called the euphoria more intense and better than with cocaine [3-01, 15-03].

Another patient noted that the effects during the first half hour of using ‘bath salts’ could not be outclassed by cocaine nor any other drugs [6-02]. The intenseness of the immediate effect after injecting synthetic cathinones was also noted by two other patients as not comparable with any other drug [11-01, 12-02]. Furthermore, one patient noted that she could still sleep and eat during the use of ‘bath salts’, which was not possible for her with other stimulant drugs [1-03].

Availability

Of the interviewed patients nine noted that the availability of ‘bath salts’ play an important factor in purchasing or consuming these substances [1-04, 2-02, 3-02, 6-03, 7-03, 9-02, 12-04, 13-03, 14-03]. Hereby the patients noted that synthetic cathinones are readily available on the drug scene and on the internet.

One patient stated that due to the fact that many patients are using ‘bath salts’ you do not have to purchase the substances yourself on the internet [6-04]. Another factor that this patient also noted is that due to the cheap price of ‘bath salts’ users are willing to give you a dosage for free on the drug scene [6-04].

4.2.1.2 Internet and legality

Acquisition via internet

Thirteen patients described that the internet plays a role in purchasing these substances [1-05, 2-02, 3-03, 5-02, 6-05, 7-03, 8-03, 9-03, 10-03, 11-02, 12-05, 13-04, 14-04]. These patients noted that due to the accessibility of these drugs via internet it is much easier to purchase these substances in comparison to other drugs.

Six of the interviewed patients had bought ‘bath salts’ themselves on the internet [4-03, 6-06, 7-03, 10-03, 12-06, 14-05]. One of these also stated that he sold the substances [7-04].

Ten patients noted to know other people that order via the internet [1-05, 3-03, 5-02, 6-05, 8-03, 9-04, 11-02, 12-05, 13-06, 15-04]. Three patients noted that the acquaintances or friends where they acquired the substances from had purchased these on the internet [9-04, 11-02, 15-04]. One patient stated to have bought the ‘bath salts’ via a drug-dealer before [13-05].

Seven Patients described that the cash on the delivery system was used when purchasing the synthetic cathinones on the internet [04-04, 06-05, 7-03, 09-04, 10-03, 12-07, 14-05]. Here it was noted by two patients, that a benefit of this system is, that you do not have to have money on hand immediately when ordering the ‘bath salts’. Therefore, you can pay later at the postal office as soon as you have the money or share the costs with other people [6-05, 12-07].

Legality

For ten patients, legality did not play a factor in purchasing these substances [1-06, 2-03, 4-05, 5-03, 6-07, 8-04, 10-04, 12-08, 13-07, 15-05].

Three patients noted that the factors legality and availability influence each other [6-07, 9-05, 15-05]. Hereby it was noted that the websites on the regular internet mostly only offer legal substances. Therefore, the legality does not play a prior role in purchasing the synthetic cathinones but the availability of these substances on the regular internet does.

Five patients noted that legality does partly play a role for them [3-04, 7-05, 9-05, 11-03, 14-06]. One of these patients, who also sold the substances, explained he was scared of the consequences when he would be caught selling ‘bath salts’ [7-03, 7-05]. Another patient described that she was scared of the consequences when buying illegal drugs [14-06]. Another patient noted that the legality could play a role for young people when wanting to experiment with drugs [3-04].

'Darknet' versus 'Clearnet'

Of the patients that had ordered the substances on the internet, six patients had ordered the substances on the regular internet, also referred to as 'Clearnet' [4-03, 6-06, 7-03, 9-04, 12-06, 14-05]. Three patients noted the websites they had purchased on, namely 'Fox-chem', 'Rc-supply' and 'Chemical cowboys' [9-04, 12-06, 14-05].

One patient described that he ordered predominantly on the 'Darknet' [10-03]. Therefore, he could also purchase illegal synthetic cathinones, as MDPV. Another patient noted that some people order synthetic cathinones on the 'Darknet' but that it is predominately used for ordering heroin or cocaine [6-08].

4.2.1.3 Risks and side effects

Psychotic symptoms

Fourteen patients described that either they themselves had suffered from psychotic symptoms or people they knew had suffered from psychotic symptoms due to the use of 'bath salts'.

Six of these 14 patients stated to have suffered from psychotic symptoms themselves [1-08, 3-05, 4-06, 6-09, 7-06, 14-07]. Two of these described their symptoms as psychosis [7-06, 14-07]. Two noted to have suffered from hallucinations and paranoia [1-08, 6-09]. And the other two stated to have suffered from paranoia solely [3-05, 4-06].

Furthermore two of these patients noted in the interview that they were administered to a psychiatric clinic due to their symptoms [6-09, 14-07]. One patient described, that when he was administered to the hospital in an ambulance, he thought that somebody was trying to force entry into the ambulance via the car top [6-09]. He further described that he never had such intense hallucinations as with MPDV, but noted afterwards that nonetheless nothing compared to the effects of the first half hour when injecting MDPV. The other patient noted that she completely deteriorated mentally and that she believed in things that were not true and therefore she had to be administered [14-07].

The majority of the patients, namely twelve, stated to know other people who had suffered from psychotic symptoms due to the use of ‘bath salts’ [1-08, 3-05, 5-04, 6-09, 7-06, 8-05, 9-06, 10-05, 11-04, 12-09, 13-08, 15-06].

For two patients the psychotic symptoms were the reason for quitting the abuse of these substances [1-08, 14-09]. For the patient with ID 1 the reason for this was because she herself had suffered from the psychotic symptoms. The patient with ID 14 noted that, next to the fact that she herself had suffered from psychotic symptoms, her ex-partner suffered from much severer psychotic symptoms and she was scared that that would happen to her as well.

Addiction potential

Six patients [7-08, 8-02, 10-06, 12-10, 13-09, 14-08] described that one issue with these substances lies within the fact that they are highly addictive. Two of these described synthetic cathinones as ‘extremely addictive’ [8-01, 10-06]. The majority of the patients that noted the high addiction potential were using ‘bath salts’ on a regular basis.

One patient described that the psychological kicking off of ‘bath salts’ was far more difficult than that of any other drug he had used [10-07]. Furthermore another patient described that due to the high addiction potential of ‘bath salts’ his use increased heavily in a short amount of time [12-10]. This patient was also stationary during the interview phase due to his increased use of synthetic cathinones and the consequences of this use.

Poly-drug use

Poly-drug use of different synthetic cathinones was described by three patients. These patients noted that either they themselves or other regular users are mixing different compounds of synthetic cathinones to use these together to achieve a different or stronger effect [8-06, 10-08, 12-11]. Whereas two of these patients [10-08, 12-11] mixed substances regularly the other patient only described that he knew that patients were doing so [8-06]. The two patients that were mixing different compounds stated synthetic cathinones that were a good combination and also described experimenting with other compounds to try new combinations.

5 Discussion

This study focussed on the concomitant use of synthetic cathinones in opioid-dependent patients receiving various OMT. The aim of this study was to gain more insight into the topic of synthetic cathinone use in opioid-dependent patients in Germany and to analyse whether differences in this use could be detected regarding the various forms of OMT.

The findings of our study showed that of the included 347 patients more than one third had used synthetic cathinones before and nearly 10 % of all patients had used synthetic cathinones in the preceding 30 days. This highlights the fact that the concomitant use of synthetic cathinones is an important and current issue with these patients.

The numbers of users are a major concern particularly when looking at the number of patients that used synthetic cathinones in the preceding 30 days, thus 10 %. The use in the preceding 30 days is a marker for recent or current use of substances. This number also coincides with the number of patients of this study who stated to use these substances on an occasional or regular basis, which was nearly 11 %. Furthermore, it must be noted that, since the data are self-reported and given voluntarily, it is likely that the real number of regular users is higher. Hence, this number is alarming because these patients are enrolled in maintenance treatment for their opioid-dependence and receive, next to a substitution agent, medical and psychological support. Nonetheless, these patients still additionally use synthetic cathinones on a regular basis.

Regarding other studies focussing on the use of synthetic cathinones in opioid-dependent patients in maintenance treatment various numbers were reported. In Hungary a rate of involvement between 10 % and 50 % was found, which is a wide spread and therefore difficult to compare to our findings. In Finland Heikman et al. reported in their study that 13 % of the patients in OMT had used NPS. Hereby they noted that the 13 % were in respect of all NPS but mainly synthetic cathinones were used. Heikman et al. used a specialised toxicology screen, but they note as a limitation that the toxicology screen did not cover all synthetic cathinones, but only the ones that were included in the screens database. Therefore, the actual number of users could have been higher. When looking at these numbers found by Heikman et al. and the findings of our study they are comparable.

Furthermore, it can be assumed, that the number of users in opioid addicts not receiving OMT is higher than the number of users in opioid-dependent patients receiving OMT. This is also reported in studies from Romania, Hungary and Austria (27,73,74). When looking at these studies, which focussed on the use of synthetic cathinones in injecting users, some points stand out. Here the rates of injection of synthetic cathinones were described between 51 % and 59 %. Comparing this to the study of the Robert-Koch-Institut in Munich, Germany, in 2015 the rate of 'bath salt' users in injecting drug users, stating to have used in the preceding 30 days, was much lower, namely 17 %. Nonetheless, this does show that the use of synthetic cathinones could possibly be higher in patients not receiving OMT. But due to the fact that the study by the Robert-Koch-Institut, did not note how many of the 'bath salt' users were enrolled in treatment, it is difficult to draw any concrete conclusions to compare the use of synthetic cathinones in patients not in OMT with our findings.

Furthermore, another aim of our survey was to explore whether differences can be detected between the various forms of OMT regarding the concomitant use of synthetic cathinones. The patients included were prescribed diacetylmorphine, methadone or levomethadone, buprenorphine or slow release oral morphine. Regarding differences of use between patients treated with the various substitution agents, a statistical trend, towards lower frequency of concomitant use in the patients treated with diacetylmorphine and higher frequency in the patients receiving methadone or levomethadone, was found. This finding is supported by other studies, which showed the positive effects of diacetylmorphine on the concomitant use of cocaine, cannabis and benzodiazepines (96,100,101). Regarding the study hypothesis this shows that diacetylmorphine could indeed be a positive factor in antagonising the concomitant use of synthetic cathinones in comparison with other OMT. Nonetheless, in this study only a statistical trend was found. The lack of significance could be explained by the small sample size concerning the different frequencies of the use of synthetic cathinones (127).

In our survey there was a significant negative correlation of age with a higher number of patients who have used synthetic cathinones before. This finding is supported by other studies exploring concomitant illicit drug use in opioid-dependent patients, where this was related to more distinct risk behaviour in younger drug users (128).

The most frequently used route of administration in this study was intravenous injection. This finding is consistent with the literature regarding the patient population consisted mostly of injecting users (27). It is noticeable that although the majority of the patients injected the 'bath salts' only very few patients reported local side effects, associated with injecting these substances, which are often described in the literature (35,79). One explanation for this could be that the other side effects stated, such as the psychotic symptoms, were more severe to the patients and covered local adverse events.

The findings concerning the most frequently used compounds coincide with the literature as well (35). This study shows that 'alpha' compounds have increased in popularity, which could be explained by the fact that these compounds are relatively novel. Therefore, when the patients filled in the questionnaires, some of these compounds were legal and they could be purchased easily. This study did not analyse whether the still legal substances were used predominantly recently and whether the illegal substances were used primarily in the past, when they were still legal.

Furthermore is it noticeable that many patients noted that the compound they had used was unknown to them. This is worrying due to the fact that not only the dosage and effects of the various synthetic cathinones can differ but also serious side effects can occur when using unknown substances. Also the unknown compounds could be a mixture of different synthetic cathinones which comes with additional health effects.

As for the desired effects reported in this study, namely kick and euphoria, these are in line with the literature (24). This is not surprising due to that fact that synthetic cathinones act as a stimulant.

The semi-structured interviews further analysed the motives for using synthetic cathinones in comparison to other drugs. When looking at the literature it is previously noted that the effects of synthetic cathinones do play a role in the use of these substances. Winstock et al. described in his survey that the users of mephedrone reported a better and longer high with mephedrone compared to cocaine (68). The study population of Winstock et al. consisted of experienced poly-drug users.

Our study population were opioid-dependent patients, who also mostly have a history of poly-drug abuse. In the interviews the majority of patients reported that the euphoria or kick synthetic cathinones give is more intense compared to other stimulant drugs, not only specifically cocaine.

Another point that was noted by some patients is that the initial effect of synthetic cathinones when injected is very intense. Additionally other patients noted that they can still feel an effect of synthetic cathinones during OMT which is not the case with other drugs. This could possibly explain the fact why synthetic cathinones are getting increasingly popular in patients enrolled in OMT. Regarding these findings it can be concluded that the effect of synthetic cathinones plays an important role in the motives for consuming these substances.

Nearly all of the patients that participated in the interview of this study stated that the cheap price of synthetic cathinones plays another important role in consuming these. This coincides with the literature where it is noted that 'bath salts' are cheaper than other drugs with a comparable action spectrum (39,129). Therefore, this is another factor which influences the motives for consuming 'bath salts', especially when considering the fact that the effect is reportedly more intense combined with a cheaper price.

The questionnaires of this study revealed that the majority of patients purchased the synthetic cathinones via acquaintances or dealers and that 24.2 % stated to have purchased the synthetic cathinones via the internet. Consequently the question arises, where the acquaintances and dealers purchased the substances from. Particularly because the 'International Narcotics Control Board' and the 'European Monitoring Centre for Drugs and Drug Addiction' noted that the internet contributes considerably to the distribution of these substances (123,130).

The semi-structured interviews showed that the internet indeed plays a huge role in the distribution of synthetic cathinones. Nearly half of the patients that were interviewed had purchased the substances themselves on the internet. This was especially applicable for the regular users which also showed in the questionnaires. But also the patients that purchased the substances via acquaintances or friends noted that these acquaintances then again had acquired the substances on the internet.

Furthermore it is also likely that drug dealers as well purchase the ‘bath salts’ on the internet due to the fact that some of the patients, that purchased online, noted that they sold part of the substances.

Nearly all patients that purchased ’bath salts’ themselves on the internet did this on the regular internet. Only one patient noted to buy on the ‘Darknet’. This coincides with the literature where it is noted that the ‘Darknet’ adds to the issue of availability through the internet but plays a more subordinate role (6).

Regarding the topic of legality, in this study legality did not play a role for the majority of the patients. This is not surprising when looking at the fact that the study population consisted of opioid-dependent patients and that these patients already used or use illegal drugs, which has also been stated in other literature before. But what does play a role for consumers of ‘bath salts’ is the cohering availability of these substances due to the legality, as it was noted in the interviews. This is also described by Measham et al., namely that legality is not the issue for most users but the ‘convenience arising from its legal status’ is (69).

Another issue that derived from the interview and is closely related to this convenience is the cash on delivery system which is offered by online shops. This makes it easy for patients to order online and leads to the fact that money on hand is not a premise when wanting to purchase these drugs. Additionally it was noted by the patients of our study that users do not have to order or buy the substances themselves, due to the fact that many people are using synthetic cathinones and these substances are therefore readily available on the drug scene.

The Hungarian national focal point also noted the importance of availability for users in 2014. Here it was reported that the use of synthetic cathinones changed with time and that this is closely related to the availability of the respective substances. This means that when one synthetic cathinone got illegalised it was compensated by a new different synthetic cathinone which was legally available (131).

Hence, the issue of availability is determined by the easy accessibility through the internet, the availability on the drug scene and the convenience of ordering without money on hand through the cash on delivery system. Therefore, the point of availability of synthetic cathinones, contributes greatly to the increasing use of these substances.

In respect of the overall side effects, described by the patients in this study, these are indeed well-known side effects of synthetic cathinones (25). Our study revealed that psychotic symptoms were experienced by a majority of patients. In the personal interviews the majority of the patients stated that either they themselves or other people they knew had suffered from psychotic symptoms. The stated symptoms hereby varied from short paranoia to hospital admission due to psychosis. Furthermore two patients suffered from serious side effects, which have been reported in various case studies (132,133).

Although psychotic symptoms and other side effects were experienced by a majority of the patients, these do not keep users from consuming these substances. One patient summed this up by stating that he never had had such severe hallucinations as with MPDV, but that still no other drugs compared to the effects of the first half hour when injecting it. This is interesting because this statement actually highlights one of the issues with these substances, namely that their effects are possibly more important to users and hence outweigh the side effects. This is worrying because patients are using synthetic cathinones and, although they are aware of the side effects and many patients have experienced these before, they hazard the consequences of this use.

Other reasons for consuming these substances despite the side effects possibly lie within the availability and easy accessibility and the polytoxicomania of these patients. Another important factor that contributes to this, is the high addiction potential of synthetic cathinones (33,70). This was previously reported in the literature and was also noted by the patients during the personal interviews of this study. What was noticeable, regarding the patients that stated this high addiction potential, is that nearly all of these were using synthetic cathinones on a regular or occasional basis.

All in all the major factors contributing to the growing popularity of synthetic cathinones, as emerged from this study, are the price, the effect, the availability and easy accessibility through the internet but also the addiction potential of ‘bath salts’ can play a role, especially when using these substances on a more frequent base.

5.1 Limitations

A couple of limitations of this study have to be pointed out. One limitation is the fact that the data are self-reported and patients participated voluntarily. Due to the short time frame of the study and the lack of efficiency of regular toxicology screens, in terms of synthetic cathinones, it was chosen for only self-reported data. Although studies have shown that valid and reliable information can be derived from self-reported data regarding drug use different biases can occur (134,135). On the one hand patients could have denied to have used synthetic cathinones before so this may have led to social desirability bias. Motives for this could lie within the fact, that these patients were afraid of the consequences, even though the data were handled anonymously. Also it is possible that the patients, who indeed use synthetic cathinones on a regular basis, did not fill in the questionnaire, which was voluntarily, with the same reasoning in mind. Other potential biases that could have occurred are, that the patients were not able to recall the information or misunderstood the questions (135). Given these limitations the data of this study underestimates the actual number of users of synthetic cathinones but, nonetheless our study did find a considerable number of users.

Another limitation arises from the fact that the questionnaire was self-designed. This was necessary because there were no previously designed standardised questionnaires regarding the topic of synthetic cathinones and the questions this study was focussing on. Although parts of the questionnaire were based on the EuropASI, for example the use in the preceding 30 days, the utilised questionnaire lacks validity and reliability (136). Nonetheless, it must be noted that most patients did fill in the questionnaire correctly and only few answers had to be counted as missing due to incorrect completion, for example when patients noted more than one answer although the question was conducted as a single response question.

Although there was a response rate in this study of approximately 39 % another limitation arises from the small sample size of patients receiving diacetylmorphine as a substitution agent. This is explained by the fact that there are only about 50 patients receiving HAT in Munich and not every patient was willing to fill in the questionnaire. Thus these analyses regarding the differences between the various OMT and the possible positive factor of HAT are limited and only revealed a statistical trend.

An additional limitation of using semi-structured interviews is that the quality of the data retrieved depends on the skills of the interviewer. Therefore, the data can be influenced by factors, as for example how the interviews were prosecuted or what ad-hoc questions the researcher proposed. Especially when looking at the fact that it is difficult to repeat an interview exactly the same way with all interviewees. Other factors that could contribute to this limitation are the personal biases of the interviewer, which can influence for example in what way the questions are asked. Also rigour, respectively trustworthiness, is more difficult to contain with qualitative data compared to quantitative data. Furthermore, which is also the case with the questionnaires, recall bias and social desirability bias can occur with interviews and therefore validity can be limited (137,138).

A limitation, regarding the qualitative content analysis by the method of Mayring, is that this method combines qualitative and quantitative aspects. This is often criticised by researchers, when comparing this method to other methods of qualitative data analysis, because this could lead to loss of qualitative data when focussing on trying to quantify the data. Furthermore it has been pointed out in the literature that the system of making fixed categories, as it is with the method of Mayring, also can lead to data loss regarding the rest of the material (139).

Another limitation derives from the fact that the coding of the interviews in this study was done by solely one researcher. Multiple coding, thus by more than one researcher, helps to counteract possible subjectivity which can play a role in the process of qualitative data analysis (140).

5.2 Implications

In the future extended studies are needed to evaluate the effect of OMT in general and HAT in particular on the concomitant use of synthetic cathinones. Ideally this should be implemented with the use of specialised toxicology screens because many synthetic cathinones are not detected by regular toxicology screens. Regarding the effects of HAT in particular extended studies with a higher sample size are needed to evaluate this effect.

Another interesting point for future research is the treatment with slow release oral morphine. Due to a comparable mode of action as diacetylmorphine, it is possible that slow release oral morphine could have the same effects as the treatment with diacetylmorphine on the concomitant use of various drugs. Therefore, future studies are needed to evaluate this potential effect.

Furthermore it will be interesting to see how far the new amendment can antagonise the ongoing distribution of all NPS and synthetic cathinones in particular in Germany. Especially when looking at some of the main motives for consuming these substances as they were found in this study.

On the one hand the availability will be constrained due to the fact that the legal shops in Germany, offering synthetic cathinones on the regular internet, will shut down. But on the other hand there is the possibility that the availability will only partly be constrained due to the fact that the amendment only focuses on Germany and not whole Europe. This means that if the German websites should shut down, due to the new amendment, it is likely that users will order from websites of other European countries. This issue arises from the fact that every European country has different laws and legal approaches for NPS. Although the German amendment seeks to restrain this, by making it an offence for people to order on foreign websites and let the products ship to Germany, nonetheless the availability could still partly be provided.

Another possibility is that the amendment would lead to a shift from the regular internet to the ‘Darknet’. This is due to the fact that the ‘Darknet’ would remain as a source for purchasing all these substances when the new amendment inures. Especially when looking at the fact that the effect of synthetic cathinones, thus the more intense euphoria compared with other similar drugs, is one of the main motives for patients when using these substances.

Another issue that arises with the new amendment is that it does not include all NPS but only derivatives of two major groups of NPS. Therefore, it illegalises only some substance groups and suppliers could be encouraged to still try to circumvent the law by producing new substances which are not part of these substance groups.

This could lead to the fact that more novel substances could emerge on the drug market of which the effects and side effects are unknown and therefore could cause even more health risks.

The findings of this study show that concomitant synthetic cathinone use in opioid-dependent patients receiving OMT is indeed a current issue and that several factors play an important role regarding this popularity. Hereby the use of synthetic cathinones is influenced by the price, the effects, the high addiction potential, as well as the availability and easy acquisition through the internet. Furthermore, this study found that HAT could be a positive factor in antagonising the worrying trend of concomitant use of synthetic cathinones in opioid-dependent patients and extended studies are needed to evaluate this effect.

6 Summary

6.1 English version

New synthetic cathinones also referred to as ‘bath salts’ are detected every year and fatalities due to these substances have increased strikingly in 2015 and 2016. Especially the intravenous use of these substances has emerged as a worrying new trend and has become increasingly popular in high risk drug users and drug treatment clients. Heroin assisted treatment (HAT) has previously shown positive effects on concomitant drug use of different substances, as benzodiazepines and cocaine, in opioid-dependent patients. Therefore, the aim of this study was to explore the concomitant use of synthetic cathinones in opioid-dependent patients in opioid maintenance treatment (OMT) in Germany and to analyse, whether differences in use can be detected regarding the various OMT.

This study focussed on the use of ‘bath salts’ in opioid-dependent patients from five clinics, offering various OMT, in Munich. The data for this study were collected by means of questionnaires and semi-structured interviews obtained within the clinical routine OMT in the facilities.

In total 347 patients were included. Of these 73.5 % were treated with methadone or levomethadone, 13.3 % with buprenorphine, with or without the combination of naloxone, 9.5 % with diacetylmorphine and 3.2 % of patients were enrolled in treatment with slow release oral morphine. Of the included patients 35.4 % had used synthetic cathinones before and nearly 10 % had used synthetic cathinones in the preceding 30 days. The age of patients showed a significant negative correlation with the use of ‘bath salts’ before and use in the preceding 30 days. There was no significant difference in the number of users between the substitution clinics. A statistical trend was found regarding the frequency of use between the different substitution agents, namely lower frequency of ‘bath salt’ use in patients treated with diacetylmorphine and higher frequency in patients receiving methadone or levomethadone. The majority of the patients reported intravenous injection of the substances as the most common method of consumption. Undesirable effects were experienced by 64.2 % of the patients with psychotic features occurring most frequently.

Furthermore this study showed that the main factors contributing to the popularity of these substances in opioid-dependent patients are rooted within the price, the availability, the effect as well as the addiction potential of these substances. Patients described synthetic cathinones as cheap and strongly euphoric, compared to other drugs. Furthermore these substances were described as readily available and easy to be purchased via internet. The majority of the patients had either themselves ordered the substances on the internet or the acquaintances they purchased from had done so. Furthermore synthetic cathinones were described as highly addictive. All these factors outweigh the side effects, especially the often occurring psychotic symptoms, which were experienced by the majority of the patients of this study.

The results of this study highlight the fact that concomitant use of synthetic cathinones is a current issue for patients receiving opioid maintenance treatments. This study revealed a statistical trend towards lower frequency of concomitant use in patients treated with diacetylmorphine. More studies are needed to evaluate this effect, ideally using specialised toxicology screens. Furthermore, this study showed the main motives leading to the use of synthetic cathinones, namely the cheap price, the stimulant effects, the high addiction potential, as well as the availability, which is greatly determined by the easy accessibility through the internet.

The findings of this study regarding the motives of users of synthetic cathinones are interesting when looking at the new amendment, which was approved recently in Germany and which illegalises whole substance groups of new psychoactive substances (NPS), such as synthetic cathinones. The amendment will possibly constrain the availability of these substances, but due to the fact that the amendment solely focuses on Germany the availability could partly be provided by other countries. Especially when looking at the fact that not only the availability but also the strong euphoric effects of synthetic cathinones are one of the main motives for people for using these substances. Furthermore by including two major substance groups, but not all NPS, the amendment still gives suppliers the opportunity for circumventing this law by producing new substances.

6.2 German version

Jedes Jahr kommen neue synthetische Cathinone auf den Drogenmarkt - besser bekannt unter dem Namen „Badesalze". Die damit zusammenhängenden Todesfälle sind im Jahr 2015 und 2016 drastisch angestiegen. Vor allem der intravenöse Konsum von diesen Substanzen hat sich als neuer, besorgniserregender Trend herauskristallisiert und wird zunehmend beliebter in den Kreisen von risikobereiten Drogenkonsumenten und Patienten in Drogensuchtbehandlung. Die heroingestützte Behandlung hat in der Vergangenheit bei opioidabhängigen Patienten positive Auswirkungen hinsichtlich des Beikonsums verschiedenster Substanzen wie Benzodiazepine und Kokain gezeigt. In Anbetracht dessen war das Ziel dieser Studie, einen Überblick über den Beikonsum von synthetischen Cathinonen bei opioidabhängigen Patienten in Substitutionsbehandlung in Deutschland zu bekommen. Dabei sollte analysiert werden, inwieweit Unterschiede in Bezug auf die verschiedenen Arten der Substitutionsbehandlungen festgestellt werden können.

Diese Studie befasste sich mit dem Konsum von „Badesalzen" bei opioidabhängigen Patienten in fünf Substitutionsambulanzen mit verschiedenen Substitutionsbehandlungen in München. Die Daten der Studie wurden mithilfe von Fragebögen und semistrukturierten Interviews innerhalb der klinischen Routinesubstitutionsbehandlung der Ambulanzen erfasst.

Insgesamt wurden 347 Patienten inkludiert. 73,5 % der Patienten wurden mit Methadon oder Levomethadon behandelt, 13,3 % mit Buprenorphin (mit oder ohne Kombination von Naloxon), 9,5 % mit Diacetylmorphin und 3,2 % erhielten eine Behandlung mit Morphin in retardierter Form. Von den inkludierten Patienten hatten 35,4 % bereits in der Vergangenheit einmal synthetische Cathinone konsumiert und fast 10 % hatten synthetische Cathinone in den vorangegangenen 30 Tagen konsumiert. Das Alter der Patienten zeigte eine signifikant negative Korrelation mit dem Konsum von „Badesalzen" im Allgemeinen, sowie dem Konsum in den vorangegangenen 30 Tagen auf. Es wurde kein signifikanter Unterschied zwischen der Anzahl an Konsumenten in den verschiedenen Ambulanzen gefunden. Ein statistischer Trend ergab sich bezüglich der Frequenz des Konsums und den verschiedenen Substitutionspräparaten, nämlich eine niedrigere Konsumfrequenz von „Badesalzen" bei den Diacetylmorphin-Patienten und eine höhere Konsumfrequenz bei Patienten, die mit Methadon oder Levomethadon behandelt wurden.

Die Mehrheit der Patienten gab intravenösen Konsum als häufigste Konsummethode an. Unerwünschte Effekte wurden von 64,2 % der Patienten angegeben. Hierbei traten psychotische Symptome am häufigsten auf.

Zudem zeigte diese Studie die Hauptfaktoren auf, die zur Beliebtheit von „Badesalzen“ bei opioidabhängigen Patienten beitragen, nämlich der Preis, die Verfügbarkeit und die Wirkung, sowie das Suchtpotenzial dieser Substanzen. Patienten beschrieben synthetische Cathinone als billige Substanzen mit einer stark euphorisierenden Wirkung. Weiter seien sie leicht verfügbar und einfach über das Internet zu erwerben. Der Großteil der Patienten hatte entweder selbst die Substanzen über das Internet bestellt oder Bekannte, bei denen diese erworben wurden, hatten die Substanzen über das Internet bestellt. Des Weiteren wurden synthetische Cathinone von den Patienten als extrem süchtig machend beschrieben. All diese Faktoren überwiegen gegenüber den Nebenwirkungen, vor allem den psychotischen Symptomen, die von einem Großteil der Patienten angegeben wurden.

Die Ergebnisse dieser Studie heben hervor, dass der Beikonsum von synthetischen Cathinonen ein aktuelles Problem bei Patienten in Substitutionsbehandlung darstellt. Diese Studie zeigte einen statistischen Trend bezüglich einer niedrigeren Beikonsumfrequenz bei Patienten in Diacetylmorphin-Behandlung. Weitere Studien sind erforderlich um diesen Effekt zu evaluieren - idealerweise mit toxikologischen Untersuchungen. Zusätzlich zeigte diese Studie die Hauptbeweggründe auf, die zum Konsum von synthetischen Cathinonen führen, nämlich der niedrige Preis, die euphorisierende Wirkung, das Suchtpotenzial sowie die Verfügbarkeit, welche stark vereinfacht wird durch die Zugänglichkeit über das Internet.

Die Ergebnisse dieser Studie sind besonders vor dem Hintergrund interessant, dass vor Kurzem ein neues Gesetz (Neue-psychoaktive-Stoffe-Gesetz, NpSG) in Deutschland in Kraft getreten ist, welches gesamte Substanzgruppen von neuen psychoaktiven Substanzen (NPS), wie synthetische Cathinone, illegalisiert. Das NpSG wird in Zukunft möglicherweise die Verfügbarkeit von NPS einschränken. Da das NpSG auf Deutschland beschränkt ist, könnte eine Verfügbarkeit über andere Länder instand gehalten werden. Insbesondere angesichts der Tatsache, dass nicht nur die Verfügbarkeit, sondern auch die stark euphorisierende Wirkung von „Badesalzen“ einer der Hauptbeweggründe für den Konsum darstellt. Da das Gesetz außerdem nur zwei große Substanzgruppen inkludiert, gibt das NpSG Anbietern weiterhin die Möglichkeit, es durch die Entwicklung von neuen Substanzen zu umgehen.

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Index of abbreviations

AMG	Arzneimittelgesetz
BtMG	Betäubungsmittelgesetz
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
EuropASI	European Addiction Severity Index
HAT	Heroin assisted treatment
HIV	Human immunodeficiency virus
i.v.	intra vena (Latin), intravenous
IUPAC	International Union of Pure and Applied Chemistry
OMT	Opioid maintenance treatment
MMT	Methadone maintenance treatment
NPS	New psychoactive substances
NpSG	Neues-psychoaktive-Stoffe-Gesetz
SIH	Supervised injectable heroin
UNODC	United Nations Office on Drugs and Crime
XR	Extended release

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Appendices

Appendix I

Table 14: Overview of the controlled synthetic cathinones in the German Narcotics Act with the IUPAC names.

	Synthetic cathinone	IUPAC
Annex I	Clephedrone (4-CMC, 4-Chlormethcathinone)	1-(4-Chlorphenyl)-2-(methylamino)propan-1-one
	N-Ethylbuphedrone (NEB)	2-(Ethylamino)-1-phenylbutan-1-one
	4-Ethylmethcathinone (4-EMC)	1-(4-Ethylphenyl)-2-(methylamino)propan-1-one
	Ethylone (bk-MDEA, MDEC)	1-(1,3-Benzodioxol-5-yl)-2-(ethylamino)propan-1-one
	Methcathinone (Ephedrone)	2-Methylamino-1-phenylpropan-1-one
	3-methylmethcathinone (3-MMC)	2-(Methylamino)-1-(3-methylphenyl)propan-1-one
	4-methylmethcathinone (Mephedrone)	1-(4-Methylphenyl)-2-methylaminopropan-1-one
	Pentylone (bk-MBDP)	1-(1,3-Benzodioxol-5-yl)-2-(methylamino)pentan-1-one
Annex II	Buphedrone	2-(Methylamino)-1-phenylbutan-1-one
	3,4-Dimethylmethcathinone (3,4-DMMC)	1-(3,4-Dimethylphenyl)-2-(methylamino)propan-1-one
	Ethcathinone	(*RS*)-2-(Ethylamino)-1-phenylpropan-1-one
	Flephedrone (4-Fluormethcathinon, 4-FMC)	1-(4-Fluorphenyl)-2-(methylamino)propan-1-one

3-Fluormethcathinone (3-FMC)	1-(3-Fluorphenyl)-2-(methylamino)propan-1-one
3,4-Methylendioxypyrovalerone (MDPV)	1-(Benzo[d][1,3]dioxol-5-yl)-2-(pyrrolidin-1-yl)pentan-1-one
4-Methylethcathinone (4-MEC)	2-(Ethylamino)-1-(4-methylphenyl)propan-1-one
Methylone (3,4-Methylendioxy-N-methcathinon, MDMC)	1-(Benzo[d][1,3]dioxol-5-yl)-2-(methylamino)propan-1-one
Pentedrone	2-(Methylamino)-1-phenylpentan-1-one
α-Pyrrolidinovalerophenone (α-PVP)	1-Phenyl-2-(pyrrolidin-1-yl)pentan-1-one

Appendix II

Questionnaire (German)

Anonymer Fragebogen Badesalz Konsum

Angaben im Fragebogen sind anonym und haben keine Konsequenzen
für die Substitutionsbehandlung

1) Geschlecht:

☐ Mann

☐ Frau

2) Alter: _____ Jahre

3) Seit wie vielen Jahren sind Sie opiatabhängig? _____ Jahre

4) Seit wie vielen Jahren sind Sie in Substitutionsbehandlung? _____ Jahre

5) Aktuelles Substitutionsmittel

☐ Levomethadon ☐ Methadon

☐ Diamorphin ☐ Buprenorphin/Suboxone

☐ Morphin Retard (Substitol) ☐ Sonstige _____

6) Haben Sie jemals Badesalze konsumiert?

☐ Ja

☐ Nein

Wenn Ihre Antwort NEIN ist, das heißt dass Sie noch nie Badesalze konsumiert haben, endet der Fragebogen hier. Vielen Dank für das Ausfüllen des Fragebogens!

Wenn Ihre Antwort JA ist, das heißt dass Sie schon einmal Badesalze konsumiert haben, bitte die folgenden Fragen beantworten.

7) Wie häufig konsumieren Sie Badesalze?

☐ Regelmäßig

☐ Gelegentlich

☐ Selten bis einmalig

8) Vor wie vielen Jahren haben Sie das erste Mal Badesalze konsumiert?

vor _____ Jahren

Bitte Seite 2 des Fragebogens beachten!

9) Haben Sie jemals Badesalze in größeren Mengen konsumiert (mind. 3-mal pro Woche oder an 2 aufeinander folgenden Tagen)?

☐ Ja *(bitte angeben in welchem Zeitraum)* _____

☐ Nein

10) An wie vielen Tagen haben Sie in den letzten 30 Tagen Badesalze konsumiert?

_____ Tage *(bei Antwort 0 Tage → Frage 11 überspringen, weiter bei Frage 12)*

11) Wenn Sie konsumiert haben, wie oft haben Sie im Durchschnitt an so einem Tag konsumiert?

_____ mal

12) Wie konsumieren Sie meistens Badesalze?

☐ Oral/ Bombing

☐ Nasal/ Schnupfen/ Sniefen

☐ Rauch

☐ Injiziert nicht intravenös/ Gespritzt nicht i.v.

☐ Injiziert intravenös/ Gespritzt i.v.

☐ Rektal

13) Was genau haben Sie (meistens) konsumiert?

☐ Mephedron

☐ 4-MEC

☐ MDPV

☐ Methylon

☐ Unbekannt

☐ Sonstige _____

14) Wie haben Sie die Badesalze erhalten/erworben?

☐ Dealer

☐ Bekannte/ Freunde

☐ Internet *(wenn möglich angeben welche Website)* _____

☐ Sonstige _____

Bitte Seite 3 des Fragebogens beachten!

15) Welchen Effekt haben Sie sich erwartet, wenn Sie Badesalze konsumiert haben?

☐ Kick/Euphorie

☐ Beruhigung/Sedierung

☐ Anders nämlich _____

16) Ist dieser Effekt eingetreten?

☐ Ja

☐ Nein

17) Sind durch den Badesalz Konsum schon einmal unerwünschte Effekte aufgetreten?

☐ Ja *(bitte angeben welche)* _____

☐ Nein

18) Sind durch den Badesalz Konsum in Kombination mit Ihrem Substitutionsmittel schon einmal unerwünschte Effekte aufgetreten?

☐ Ja *(bitte angeben welche)* _____

☐ Nein

19) Wären Sie dazu bereit in einem persönlichen Interview weitere Fragen zum Thema Badesalze zu beantworten?

☐ Ja *(bitte Name angeben)* _____

☐ Nein

Vielen Dank für das Ausfüllen des Fragebogens!

Appendix III

Semi-structured interview (German)

Persönliches Interview *Nr.*

Wie wurden Sie auf Badesalze aufmerksam und wie verbreiten sich Informationen hierüber?

Wie wird in der Szene über Badesalze gesprochen?

Was waren die Gründe/die Motivation für den Badesalzkonsum?

Erster Konsum:

Später:

Was ist die Wirkung von Badesalz (im Gegensatz zu vergleichbaren Substanzen, z.B. Crystal Meth)?

Was sind Vorteile/Nachteile gegenüber klassischen Drogen?

Vorteile:

Nachteile:

Welche Rolle spielt der Preis beim Konsum/Erwerb von Badesalzen?

Welche Rolle spielt die Verfügbarkeit beim Konsum/Erwerb von Badesalzen?

Welche Rolle spielt das Internet beim Erwerb? Selbst, Freunde, Dealer? Rolle des Deep-web?

Welche Rolle spielt die Legalität beim Konsum/Erwerb von Badesalzen?

Was sind polizeiliche Konsequenzen wenn man im Besitz von Badesalzen ist?

Wo und wie werden Badesalze konsumiert (allein, mit anderen; bei bestimmten Anlässen)?

Was wird genau konsumiert (reine Stoffe, Mischungen, unbekannt)?

Bekommt man hierüber Informationen vom Dealer?

Werden Badesalze auf Vorrat gekauft?

Wie haben Sie konsumiert? (auch anders als im Fragebogen angegeben?)

Was sind spezifische Nebenwirkungen die während oder nach dem Konsum aufgetreten sind?

Bei sich selbst:

Bei anderen:

Wie häufig treten Psychosen auf?

Bei sich selbst:

Bei anderen:

Was waren die Gründe für das Beenden des Konsums?

Appendix IV

Interview Quotes (German)

A: Interviewer

P: Patient

ID 1 (2016). Personal interview with the author. Munich, 14.06.2016.

[1-01] A: „Und welche Rolle spielt der Preis?“ P: „Ja, das ist nämlich auch ein Grund was dazu kommt, das ist super billig. Das schmeißen sie dir ja nach. Das kann sich jeder leisten.“

[1-02] P: „[…] ein Gramm keine 20 Euro. Es ist spottbillig.“

[1-03] A: „Was ist dann die Wirkung von Badesalz im Vergleich zu anderen ähnlichen Substanzen?“ P: „Das erste Mal war der Hammer. War heftig gut. Hast deinen Flash gehabt. Gut dabei gefühlt, kein Abturn, nicht so wie man es beim Koks kennt, warst wunderbar drauf. Konntest ganz normal reden. Das Heftige war ich konnte essen, schlafen, alles. Das kannst du normalerweise nicht. Bei Koks, Speed und so, da kann ich normal nicht mehr essen und schlafen. Und bei dem Zeug hatte ich Hunger, hab was gegessen. Am Abend hingelegt geschlafen. Da war ich dann echt baff.“

[1-04] A: „Spielt die Verfügbarkeit eine Rolle beim Erwerb von Badesalz?“ P: „Doch das spielt auf jeden Fall eine Rolle.“ A: „Dass es einfacher zu besorgen ist?“ P: „Ja.“

[1-05] P: „Und das mit dem Internet das ist ja der absolute Oberhammer.“ A: „Kennen Sie auch Leute die es übers Internet bestellen?“ P: „Ja.“

[1-06] A: „Spielt die Legalität noch eine Rolle?“ P: „Glaub ich nicht […]“. A: „Es ist nicht so, dass grad die neuen Stoffe immer mehr konsumiert werden?“ P: „Nein.“

[1-07] A: „Und gab es für Sie noch andere Nachteile gegenüber klassischen Drogen?“ P: „[…]Was halt ganz schlimm ist bei der Droge, ist der Verfolgungswahn und zwar extremst und selbst mir ist das dann passiert. Ich hab damals zu den Anfangszeiten immer lachen müssen, weil ich es mir gar nicht vorstellen konnte und im Nachhinein muss ich sagen krass, weil mir selber ist es ganz genauso gegangen, weil ich selber hatte auch Verfolgungswahn und Hallus. Ich habe meinen Mann draußen im Garten stehen sehn und der hat sich unterhalten mit unserer Substitutionsärztin, Bullen warn daneben gestanden und ich war überzeugt davon der lässt mich jetzt in die Psychiatrie einweisen. Und daraufhin bin ich in den Hintergärten in Maisach rumgehupft.“ A: „Obwohl da gar nichts war eigentlich?“ P: „Nein, unglaublich. Wahnsinn, was da auch passieren kann.“

[1-08] A: „Und was waren dann die Gründe dafür, dass Sie dann keine Badesalze mehr genommen haben?“ P: „Ja das was ich erzählt hab. Abgrund vor mir selbst.“

ID 2 (2016). Personal interview with the author. Munich, 14.06.2016.

[2-01] A: „Welche Rolle spielt der Preis beim Konsum beziehungsweise Erwerb von Badesalzen?“ P: „Günstiger aber dafür ist es Dreck.“

[2-02] A: „Welche Rolle spielt die Verfügbarkeit beim Konsum beziehungsweise Erwerb von Badesalzen?“ P: „Übers Internet schon gut verfügbar.“

[2-03] A: „Welche Rolle spielt die Legalität beim Konsum von Badesalzen?“ P: „Egal.“

ID 3 (2016). Personal interview with the author. Munich, 15.06.2016.

[3-01] A: „Was ist die Wirkung von Badesalz im Gegensatz zu vergleichbaren Substanzen, zum Beispiel Crystal Meth?“ P: „Aufpushend, sehr stark, ähnlich wie Kokain aber bessere Euphorie.“

[3-02] A: „Welche Rolle spielt die Verfügbarkeit beim Konsum beziehungsweise Erwerb von Badesalzen?“ P: „Größte Rolle, leichter verfügbar.“

[3-03] A: „Welche Rolle spielt das Internet beim Konsum beziehungsweise Erwerb von Badesalzen?“ P: „Bekannte haben es im Internet gekauft.“

[3-04] A: „Welche Rolle spielt die Legalität beim Konsum beziehungsweise Erwerb von Badesalzen?“ P: „Auch, vor allem für jüngere Leute, die alles ausprobieren wollen.“

[3-05] A: „Was sind spezifische Nebenwirkungen die während oder nach dem Konsum bei Ihnen aufgetreten sind?“ P: „Paranoia, Verfolgungswahn.“ A: „Wie häufig treten Psychosen auf?“ P: „Bei allen, auch bei den Bekannten kommt es oft vor.“

ID 4 (2016). Personal interview with the author. Munich, 15.06.2016.

[4-01] A: „Und was spielt der Preis für eine Rolle beim Konsum von Badesalzen?“ P: „Denk die Größte eigentlich.“

[4-02] A: „Was ist so die Wirkung von Badesalz im Vergleich zu ähnlichen Substanzen?“ P: „Ja, Badesalz ist bisschen mit MDMA vergleichbar. Man kommt dann auch in so einen Rausch und Glücksgefühle richtig krass. Also in meinem Leben war ich noch nie so glücklich.“

[4-03] A: „Wie wurden Sie denn auf Badesalze aufmerksam?“ P: „Durch einen Freund. Der hat es mitgebracht und dann hab ich es probiert. Und das fand ich ganz toll. Mephedrone war das. Und dann hab ich es mir selber bestellt. Im Internet. Auf so einer englischen Seite. Das war vor sechs Jahren, mit 19 ungefähr. War im normalen Internet, so eine Pflanzenwebsite und da war es als Pflanzendünger deklariert.“

[4-04] P: „[…] man muss es ja dann im Internet bestellen und warten bis es kommt und ich hab damals per Nachnahme gezahlt.“

[4-05] A: „Welche Rolle spielt die Legalität meinen Sie?“ P: „Ich glaub es kommt darauf an, ob die alten Sachen verfügbar sind. Dann spielt das Legale und Illegale nicht so eine Rolle. Man nimmt dann einfach was man kennt und gut findet. Und wenn es nicht da ist, dann nehmen die auch das neue [Badesalz], denke ich.“

[4-06] A: „Halluzinationen oder Verfolgungswahn?“ P: „Einmal Verfolgungswahn.“

ID 5 (2016). Personal interview with the author. Munich, 14.06.2016.

[5-01] A: „Was sind Vorteile von Badesalz gegenüber klassischen Drogen?“ P: „Der Kostenpunkt natürlich. Preisleistung ist super. […]“ A: „Und der Preis?“ P: „Ja, das ist saugünstig.“

[5-02] A: „Und welche Rolle spielt die Verfügbarkeit?“ P: „Man kann sich es halt, wenn mein ein bisschen Ahnung davon hat, im Internet bestellen.“ A: „Kennen Sie auch Leute die sich es im Internet bestellen? “ P: „Ja, fast jeder bestellt es sich.“ A: „Sie haben es selber nie im Internet bestellt?“ P: „Nein.“

[5-03] A: „Werden dann auch die Sachen die gerade noch legal sind am meisten genommen?“ P: „Ich glaub das macht keinen Unterschied.“

[5-04] A: „Wie häufig treten Psychosen auf?“ P: „Kriegt man gar nicht mit. Ab und zu kommt das schon mal vor, dass jemand den man halbwegs kennt, ja der hatte eine Psychose oder ist ausgetickt, aber so sieht man das ja nicht auf den ersten Blick.“

ID 6 (2016). Personal interview with the author. Munich, 24.06.2016.

[6-01] A: „Was sind Vorteile von Badesalz gegenüber klassischen Drogen?“ P: „[…] Aber da [Kokain] reichen halt keine 50 Euro zu der Zeit hab ich viel Heroin verkauft, dass man sich das überhaupt leisten kann. Der Preis ist ein Vorteil, wenn man weiß wo man bestellt.“

[6-02] P: „[…] Aber trotzdem diese erste halbe Stunde. Da kommt kein Kokain und nichts dran. Von der Einfuhr davon.“ A: „Von dem Kick?“ P: „Ja.“

[6-03] A: „Was spielt die Verfügbarkeit für eine Rolle beim Konsum?“ P: „Ich weiß nicht, ja im Endeffekt ist es vielleicht auch für viele eine Verfügbarkeitsfrage.“

[6-04] „[…] Du hängst den ganzen Tag draußen rum, und wenn alle nehmen nimmst du einfach mit. Du brauchst gar nicht selber bestellen und du wirst auch bei Schnellem, du kriegst auch ohne Geld was, weil es halt eben nicht so viel kostet. Lädst du halt mal die ein, lädt der halt mal dich ein. […]“

[6-05] P: „[…] Es ist ja ganz einfach man braucht im Endeffekt kein Geld. Das läuft ja in München alles über Nachnahme bei diesen drei bis vier Shops, die es noch gibt, die per Nachnahme liefern. Und wenn die kein Geld haben, dann suchen die sich so drei bis vier Leute, wo jeder 30 Euro hat und dann lösen die‘s aus. Die Hälfte kriegen die, die‘s Geld haben, die andere Hälfte der, der es bestellt hat und dadurch ist das so verbreitet, weil man halt ohne Geld was bestellen kann.“

[6-06] A: „Wie wurden Sie damals auf Badesalze aufmerksam?“ P: „Das erste Mal war bevor das hier in München der große Boom war, 2008 war das. […] Hab das damals mit einem Spezel über ein Pflanzengeschäft in England bestellt. Da wurde das als Kakteendünger verkauft.“

[6-07] A: „Und welche Rolle spielt die Legalität?“ P: „Die Leute, die meisten, bestellen ja nur in den Shops, wo es Nachnahme gibt. Und das machen nur die, die legale Sachen verschicken.“ A: „Mehr mit der Nachnahme zu tun?“ P: „Ja weil die Leute wissen, dass sie dafür kein Geld brauchen. Die wissen schon, dass sie Leute finden zum Zusammenlegen, zum Auslösen. Und so geht das ja die ganze Zeit.“ [06-08] A: „Im Darknet?“ P: „Alles im normalen Internet. Es gibt Darknet schon auch, aber die Leute, die da verkaufen sind die Gleichen, die immer legale Shops auch haben. A: „Kennen Sie auch Leute die es im Darknet bestellen?“ P: „Ja aber weniger Schnelles, eher andere Sachen. Eher H und sowas.“

[6-09] P: „Kriegt ja jeder Psychose von MDPV. Wenn einer sagt das stimmt nicht, dann lügt er. Bei mir war‘s auch so. […] Ich hatte immer nur Verfolgungswahn, aber schon Halluzinationen auch. Ich war im Krankenwagen, wo ich mich da hab einliefern lassen. Und ich hab echt gedacht, dass jemand durch das Dach vom Krankenwagen einsteigt. Also krank. Und früher hab ich viel LSD und Pillen, in den Neunzigern zu Technozeiten genommen, wochenlang, aber ich hab noch nie solche Hallus wie auf MDPV gehabt. Sowas hab ich noch nie in meinem ganzen Leben erlebt, was man auf dem Zeug erlebt, das ist nicht normal. Aber trotzdem diese erste halbe Stunde, da kommt kein Kokain und nichts dran. Von der Einfuhr davon.“ A: „Von dem Kick?“ P: „Ja.“

ID 7 (2016). Personal interview with the author. Munich, 01.07.2016.

[7-01] A: „Was sind Ihrer Meinung nach Vorteile von Badesalz gegenüber zum Beispiel klassischen Drogen, wie Kokain?“ P: „Gibt keine. Ok vielleicht der Preis.“

[7-02] A: „Und was zahlen Sie so?“ P: „109 Euro für fünf Gramm.“

[7-03] A: „Warum nehmen Sie dann auch häufiger Badesalz und nicht nur Crystal?“ P: „Weil es in München irgendwie eher Badesalz gibt als Crystal.“ A: „Also die Verfügbarkeit ist einfacher?“ P: „Ja.“

[7-04] A: „Wo kaufen Sie das?“ P: „Internet.“ A: „Über das Darknet oder normale Internet?“ P: „Normale Internet in Deutschland.“ […] A: „Funktioniert das über Nachnahme?“ P: „Ja genau.“ A: „Tun Sie sich dann zusammen, wenn Sie das abholen oder ist das immer nur für sich selber?“ P: „Nein ich verkaufe das ja.“

[7-05] A: „Holen Sie es auch immer ab wenn Sie es bestellen?“ P: „Ich bestell immer so vier bis fünf Pakete. Eins lass ich mir vom Postboten gleich geben und den Rest lass ich auf der Post und hol jeden Tag ein bis zwei ab.“

[7-06] A: „Spielt das auch eine Rolle im Konsum, die Legalität?“ P: „Bei mir schon.“ A: „Haben Sie Angst vor den Konsequenzen, wenn Sie damit erwischt werde?“ P: „Ja.“

[7-07] A: „Und Sie hatten auch Psychose aufgeschrieben?“ A: „Ja hatte ich mal. Von MDPV […].“ P: „Sehen Sie Psychosen auch häufig bei anderen Leuten?“ P: „Ja.“

[7-08] A: „Finden Sie es vergleichbar mit Koks?“ P: „Nein Koks ist besser. Alles ist besser wie das scheiß Badesalz.“ A: „Aber Sie nehmen es trotzdem?“ P: „Weil das Suchtpotenzial einfach total krass ist.“

ID 8 (2016). Personal interview with the author. Munich, 06.07.2016.

[8-01] A: „Spielt der Preis eine Rolle beim Konsum von Badesalzen?“ P: „Nein also das Badesalz ist teilweise schon teurer wie Koks. Die Leute werden so extrem süchtig. […]“ A: „Der Preis spielt also keine große Rolle?“ P: „Ja das kommt drauf an, wenn jemand bestellt, der wird reich. Aber ich bin ja keiner der bestellen will.“

[8-02] A: „Wie ist Badesalz von der Wirkung her im Vergleich zu anderen auch ähnlichen Substanzen?“ P: „Also das alte [Badesalz] kann man vergleichen von der Einfuhr her mit Kokain und runterkommen, wenn es rein gemacht ist also gut gekocht, ist das ja, kann man gut vergleichen. […]“ A: „Jeder findet es schlecht aber jeder nimmt’s?“ P: „Ja weil es einfach so süchtig macht. Weils den Kick vermittelt vom alten guten Koks von früher aber halt nur eine ganz kurze Zeit.“

[8-03] A: „Haben Sie im Internet bestellt?“ P: „Nein hab ich noch nie bestellt, ich weiß auch gar nicht wie das geht. Ich hab schon mal zugeschaut, wie das einer gemacht hat, die haben das ja sogar vom Computer von der Therapie aus bestellt und da hin schicken lassen. […] Ich hab ja schon mitgekriegt, dass manche pro Woche 10-20 g bestellen. Und das kommt halt dann und dann wird’s gleich gezahlt oder müssen die dann abholen. Und davor haben die dann immer Angst und wer löst mit ein und so.“

[8-04] A: „Welche Rolle spielt die Legalität dann?“ P: „Das ist den Leuten wurscht die haben so viele Vorstrafen. Die gehen über Leichen teilweise.“

[8-05] A: „Waren das dann Psychosen?“ P: „Ja, da waren ja auch schon psychotische Leute drin.“ A: „Und selbst eine Psychose?“ P: „Nein noch nie. […] Ich hab schon Leute gesehen die sind voll ausgetickt die rennen gegen die Wand und spinnen total. Man braucht halt echt eine total starke Psyche für das Zeug, aber welche Psyche macht das ewig mit?“

[8-06] A: „Und wenn jemand konsumiert, ist das immer ein reiner Stoff oder sind das auch Mischungen von Sachen?“ P: „Gibt auch Mischungen. Da stehen auch viele drauf. Das hab ich schon mitgekriegt, dass sie halt dann was zusammenschütten und selber probieren.“ A: „Mit verschiedenen Badesalzen?“ P: „Ja genau wie das dann kommt und so.“

ID 9 (2016). Personal interview with the author. Munich, 06.07.2016.

[9-01] A: „Welche Rolle spielt der Preis für Sie beim Konsum von Badesalzen? P: „Ja spielt schon eine Rolle.“

[9-02] A: „Spielt die Verfügbarkeit noch eine Rolle?“ P: „Ja, mit Sicherheit. Ich jetzt zum Beispiel würde keinen kennen mit Koks.“

[9-03] P: „Und man bestellt es ja auf der Seite und wenn man bis um zehn in der Früh bestellt, ist es am nächsten Tag da. Und in ‚Fox‘ gibt’s auch nur die Sachen die legal sind.“

[9-04] A: „Bringen lassen? Nicht selbst bestellt?“ P: „Ne nicht selber bestellt. Das war von meinem Ex und das hab ich halt immer mitgenommen, wenn ich da war. A: „Und er hat es im Internet bestellt?“ P: „Ja. […] ‚Fox-chem‘ heißt das. Und ‚rc-supply‘.“ A: „Über Nachnahme?“ P: „Ja genau.“

[9-05] A: „Spielt das noch eine Rolle Legalität, dass mehr Sachen benutzt werden die legal sind?“ P: „Ja, glaub ich schon.“ A: „Weil es über das Internet läuft?“ P: „Ja.“

[9-06] A: „Und Psychosen?“ P: „Also ich selber jetzt nicht, ich glaub das kam auch von der Menge. Aber in meinem Umkreis bei allen. Mein Exfreund der hat Kakerlaken gesehen, dachte über ihm fliegt ein Hubschrauber. Dabei waren das die Windräder. Die sind aber echt end weit weg. Aber das sind die Sinneswahrnehmungen. […] Der hat dann auch Wahnvorstellungen gekriegt. In seinem Zimmer stand eine große Schrankwand und in einem Schrank war so eine Glasplatte und die hat er rausgezogen und alles ist rausgefallen. Dann ist der in den Scherben herumgelaufen, der hat das nicht mal gemerkt. Der hat geblutet am Fuß, das war wie als wär gar nichts.“

ID 10 (2016). Personal interview with the author. Munich, 13.07.2016.

[10-01] A: „Welche Rolle spielt der Preis noch beim Konsum?“ P: „Ja ist arg billig und die Qualität ist besser.“

[10-02] A: „Und wie ist die Wirkung von Badesalz jetzt im Gegensatz zu vergleichbaren andere Substanzen?“ P: „Heftig. Ist ja 60-mal stärker wie Kokain. Das knallt richtig rein.“ A: „Vergleichbar mit Crystal Meth?“ P: „ Ja vom wach bleiben her schon von den Feelings nicht.“ A: „Meinen Sie Euphorie?“ P: „Euphorie, ja alles man sieht besser, hört besser, mehr Power, ist schneller.“

[10-03] A: „Bestellen Sie im Darknet oder normales Internet?“ P: „Unterschiedlich.“ A: „‘Fox-chem‘?“ P: „Also ‚Fox-chemicals‘ da kriegt man nur die legalen Sachen das ist Kinderfasching.“ […] A: „Bestellen Sie per Nachnahme?“ P: „Unterschiedlich. Vorkasse und Nachnahme. Je mehr eher Vorkasse. Aber dann halt in verschiedenen Sendungen.“

[10-04] A: „Und welche Rolle spielt die Legalität?“ P: „Ist egal.“

[10-05] A: „Haben Sie schon einmal Nebenwirkungen vom Badesalz gehabt, zum Beispiel Psychosen?“ P: „Nein.“ A: „Halluzinationen? P: „Nein.“ A: „Und sehen Sie häufig Leute mit Psychosen die das Zeug nehmen?“ P: „Ja, weil die es nicht vertragen und dann Leute dabei haben, die genau das Falsche tun. Weil die die Leute noch schlechter draufbringen als sie zu beruhigen.“

[10-06] A: „Und Nachteile?“ P: „Macht extremst süchtig.“

[10-07] P: „[…] Ja, hab einen psychischen Entzug von sechs Monaten gehabt. Das war übel. Vom Psychischen her das Härteste im Vergleich mit anderen Drogen.“

[10-08] A: „Nehmen Sie immer noch MDPV oder auch andere Sachen?“ P: „Ja Mischkonsum halt.“ A: „Was mischen Sie dann?“ P: „MDPV mit Mephedrone ist gut. Oder Alpha-PVP ist gut mit 3-MEC. Ist super.“ A: „Und das experimentieren Sie dann selbst so ein bisschen?“ P: „Genau.“

ID 11 (2016). Personal interview with the author. Munich, 13.07.2016.

[11-01] A: „Was sind Vorteile gegenüber klassischen Drogen?“ P: „Keine, vielleicht der Preis, man merkt noch was. Von vielen Drogen merkt man nichts mehr aber bei Badesalzen spürt man noch was bei der Einfuhr, Euphorie.“

[11-02] A: „Welche Rolle spielt das Internet beim Erwerb?“ P: „Bekannte haben es aus dem normalen Internet bestellt, nach Hause bestellen lassen. Manchmal gibt’s aber auch Nachschub Schwierigkeiten.“

[11-03] A: „Welche Rolle spielt die Legalität beim Konsum von Badesalzen?“ P: „Spielt schon eine Rolle.“

[11-04] A: „Wie häufig treten Psychosen auf, bei sich selbst?“ P: „Nein.“ A: „Bei anderen?“ P: „Ja, man muss stark sein von der Psyche für das Zeug.“

ID 12 (2016). Personal interview with the author. Munich, 19.08.2016.

[12-01] A: „Welche Rolle spielt der Preis würden Sie sagen beim Konsum von Badesalzen?“ P: „Ja, also im Internet bestellen das ist schon mal sehr einfach dann. Meistens macht man dann auch noch einen leichten Gewinn damit sogar. […] Ja, es ist eben ziemlich günstig.“

[12-02] A: „Wie war das, als Sie das Badesalz genommen haben?“ P: „Sehr stark die Wirkung und so. War sehr überrascht von der starken Einfuhr.“ P: „Wie würden Sie die Wirkung beschreiben?“ A: „Sehr stark eben und vielleicht am ehesten noch mit Kokain zu vergleichen.“ A: „Auch Euphorie?“ P: „Ja, euphorisch würd ich sagen ja. Ist auch je nach Substanz unterschiedlich.“

[12-03] A: „Und die späteren Gründe [für den Konsum]?“ P: „Eben auch weil ich dann mit meinem Methadon so hoch war und das war eben was eben noch wirklich Wirkung entfaltet hat.“

[12-04] A: „Was würden Sie sagen sind Vorteile von Badesalz gegenüber klassischen Drogen mit ähnlicher Wirkung?“ P: „Ja also im Internet bestellen das ist schon mal sehr einfach dann. […]“ A: „Verfügbarkeit ist dann ein Vorteil?“ P: „Ja, ja, in zwei Tagen ist das geliefert.“

[12-05] P: „[…] Also ist eigentlich ein bisschen dumm wenn man es auf der Straße kauft. […] Man kann es immer noch im Internet kaufen. Mit Tricks halt dann. Weil auf der ‚Fox‘ Seite kann man es glaub ich nicht mehr bestellen. Aber ein Bekannter der macht das so irgendwie, dass die davon ausgehen dass man in England sitzt und dann bekommt man es auch nach Deutschland geliefert.“

[12-06] A: „Wo haben Sies im Internet bestellt? Normales Internet oder Darknet?“ P: „Im normalen Internet.“ A: „Auf ‚Fox-chem‘?“ P: „Ja, zum Beispiel.“

[12-07] A: „Haben Sie über Nachnahme bestellt?“ P: „Ja.“ A: „Auch was auf der Post liegen lassen?“ P: „Ja, also meistens bin ich dann mit der Benachrichtigung zur Post.“ A: „Haben Sie sich dann auch zusammen getan mit anderen Leuten oder immer alleine?“ P: „Ja, wenn das Geld nicht reichte oder so dann ja.“

[12-08] A: „Haben Sie das Gefühl, dass nur das konsumiert wird was legal ist?“ P: „Ich glaube, dass das keine große Rolle spielt, wenn einer mal süchtig ist, ob das legal oder illegal ist, wie bei anderen Drogen auch.“

[12-09] A: „Und was haben Sie bei anderen für Nebenwirkungen gesehen?“ P: „Dass einer zum Beispiel ewig durch den Türspion, da ist jemand hinter. Zwei Stunden bis der wieder normal war. Und eben so Geschichten gehört, dass einer sich auf’s Dach verzogen hat und richtig gefährlich auch.“ A: „Also Richtung Psychose?“ P: „Ja.“ A: „Sie selbst haben nie eine Psychose gehabt?“ P: „Nein.“

[12-10] A: „Was ist dann der Grund, dass Sie das so häufig genommen haben? Hohes Suchtpotenzial?“ P: „Ja, würde ich sagen. Also es ging sehr, sehr schnell bei mir, dass ich da richtig dick drin hing.“

[12-11] P: „Also das Alpha fand ich eben sehr kurz und sehr intensiv. Und das MDPV eher sehr langanhaltend und konstant. A: „Würden Sie dann das MDPV bevorzugen?“ P: „Nö, ich würde eher das Alpha bevorzugen. Und auch oft gemischt mit 3-MEC dann.“ A: „Mischen Sie sich das selbst?“ A: „Ja, also wenn beide Substanzen da sind würde ich so ja halb halb mischen.“

ID 13 (2016). Personal interview with the author. Munich, 21.07.2016.

[13-01] A: „Was sind Vorteile von Badesalz jetzt gerade gegenüber klassischen Drogen?“ P: „Ein Vorteil wo ich sehe ist, dass es billiger ist. […] Kannst dir bestellen, kiloweise, ist ganz egal, ist immer da. Und billiger im Gegensatz zu Kokain […]“ A: „Spielt der Preis eine große Rolle beim Konsum von Badesalz?“ P: „Auf alle Fälle.“

[13-02] P: „[…] Und Crystal kost’ das Gramm auch 70 Euro und bei Badesalz vielleicht ein Dreißiger.“

[13-03] A: „Spielt die Verfügbarkeit noch eine Rolle beim Konsum?“ P: „Ja, genau das ist ja das Fatale weil es ja legal ist. Und eine Grauzone.“

[13-04] P: „Ein Vorteil, wo ich sehe ist, dass es billiger ist. Und eigentlich immer zugänglich. Das kannst du auch bestellen aus dem Internet. Das ist ja kein Problem. […]“

[13-05] P: „Haben Sie die Badesalze schon mal beim Dealer gekauft?“ P: „Ja ein bis zwei Mal hab ich das beim Dealer kaufen müssen.“

[13-06] A: „Kennen Sie Leute, die es im Internet bestellt haben?“ P: „Ja. Einige.“

[13-07] A: „Haben Sie das Gefühl, dass vor allem Sachen konsumiert werden die legal sind oder spielt die Legalität keine Rolle?“ P: „Ja die benutzen alles.“ A: „Also Legalität nicht so ein große Rolle?“ P: „Die spielt gar keine Rolle, bei der Sucht überhaupt nicht.“

[13-08] A: „Haben Sie selbst Nebenwirkungen gehabt?“ P: „Na damals eigentlich nicht.“ A: „Kein Verfolgungswahn, solche Sachen?“ P: „Nein, gar nicht.“ A: „Und was haben Sie für Nebenwirkungen bei anderen Leuten gesehen?“ P: „Schlimme Nebenwirkungen. Richtig paranoid.“

[13-09] A: „Und Nachteile?“ P: „Körperlicher Verfall, psychischer Verfall, schnelle Abhängigkeit. Ja genau, und einige noch mehr, aber das sind die Fatalsten.“

ID 14 (2016). Personal interview with the author. Munich, 20.07.2016.

[14-01] A: „Spielt der Preis eine Rolle beim Erwerb von Badesalzen im Vergleich zu klassischen Drogen?“ P: „Auf jeden Fall. Auf jeden Fall. Also ist gar nicht vergleichbar.“

[14-02] P: „[…] Und vor allem auch, je mehr du nimmst, desto billiger wird’s. Und auch wenn man es dementsprechend weiter verkauft.“

[14-03] A: „Spielt die Verfügbarkeit auch eine Rolle, dass man leichter rankommt?“ P: „Ja bestimmt.“

[14-04] A: „Gerade weil es auch übers Internet läuft?“ P: „Ja klar ich hör’ von 14-jährigen die in ihren Zimmer sitzen und irgendwelches Zeug zusammen mischen.“

[14-05] A: „Und das war im Internet?“ P: „Ja genau, im Internet. […] ‘Rc- supply’. Und ‘chemical cowboys’.“ A: „Lief das auch über Nachnahme?“ P: „Ja, über Nachnahme. Da kam der Postbote mit dem Paket und man hat gezahlt.“

[14-06] A: „Und die Rolle der Legalität, dass man sagt ich nehme nur die Sachen die grad legal sind?“ P: „Doch, doch schon.“ A: „Weil man das nur bestellen kann?“ P: „Ja, ne, ne, ich hab danach auch noch andere Sachen 3-MEC und so weiter ausprobiert. Nö man kann alles bestellen. Aber man schaut schon drauf.“ A: „Warum?“ P: „Weil die das strafrechtlich verfolgen können. Wegen so einem Scheiß, was man sich im Internet legal bestellen kann, wegen sowas in den Knast oder so zu müssen.“

[14-07] A: „Und welche Nebenwirkungen gab‘s da genau?“ P: „[…] Ich hab’ psychisch komplett abgebaut, hab Sachen geglaubt, die nicht wahr waren und bin in Haar gelandet, also was Schlimmeres kann nicht passieren.“ A: „Wie häufig treten Psychosen so auf?“ P: „Immer. Also wenn Psychosen dann mal aufgetreten sind und die mal so schwerwiegend waren, dann fast immer.“

[14-08] A: „Und Nachteile?“ P: „Also auf jeden Fall, du gehst körperlich sehr viel schneller kaputt. Psychisch viel abhängiger davon. Wo ich sag, wenn ich das Zeug wieder nehme, ich weiß nicht was passiert.“ A: „Macht sehr süchtig?“ P: „Ja, also ich könnte mich nicht kontrollieren wenn ich das nochmal nehmen würde.“

[14-09] A: „Was war dann der Grund für Sie, dass Sie aufgehört haben?“ P: „Letztendlich der Grund war mein Exfreund, weil ich gesehen hab was das mit ihm gemacht hat. Also ich sehe das ja jetzt noch. Ich versuch ihn ja davon wegzukriegen und … schlimm.“

ID 15 (2016). Personal interview with the author. Munich, 21.07.2016.

[15-01] A: „Noch andere Vorteile gegenüber klassischen Drogen?“ P: „Und natürlich auch weil es günstiger ist als alles andere dann. […] Aber ja, der Preis und die diese extreme Euphorie, die man gespürt hat. […]“ A: „Und spielt der Preis dann eine große Rolle?“ P: „Ja auf jeden Fall.“

[15-02] A: „Die Bekannten haben es auch im Internet bestellt?“ P: „Genau ja, und da war das legal und wenn man dann größere Mengen bestellt hat wurd’s immer günstiger.“

[15-03] A: „Was ist die Wirkung von Badesalz?“ P: „Wie Ecstasy, eine Euphorie, dass die Musik einem besser gefallen hat.“ A: „Vergleichbar mit Kokain?“ P: „Eher nicht. Also das ist eher chemisch, das merkt man dann schon auch.“ A: „Wie genau?“ P: „Ja, dass es länger wirkt und diese Euphorie intensiver ist. Bei Kokain, ja fand ich jetzt auch nicht so toll, man musste auch ziemlich schnell wieder nachlegen. Und das ist dort eben nicht gewesen. […]“ A: „ Was finden Sie Vorteile gegenüber anderer ähnlicher Drogen?“ P: „ […] Aber ja der Preis und die, diese extreme Euphorie, die man gespürt hat.“

[15-04] A: „Wie wurden Sie auf Badesalze aufmerksam?“ P: „Ein Bekannter, also wir sind damals noch viel weggegangen in die Disko und die haben das eben im Internet entdeckt, statt Ecstasy war günstiger und der eine hat das eben verkauft und dann haben wir es in Kapseln abgefüllt.“

[15-05] A: „Und spielt die Legalität noch eine Rolle, dass hauptsächlich das benutzt wird was legal ist?“ P: „ Ne die haben es nur benutzt weil es einfacher zu beschaffen ist.“ A: „Aber nicht an sich weil es legal ist?“ P: „Nein das spielt keine Rolle. Ob legal oder nicht. Die würden es auch bestellen wenn es illegal ist und durchkommt also.“

[15-06] A: „Und Psychosen, haben Sie das häufig gesehen in der Umgebung?“ P: „Die, die es länger genommen haben eben schon. Dann beim runterkommen. Mein Mann war letztens auch auf Entgiftung. Da war eben einer der hat sich deswegen behandeln lassen. Hat richtig Psychosen bekommen, Wahnvorstellungen. War bei meinem Mann ja auch. Hat sich eingebildet, dass Leute draußen stehen weil man dann drei Tage wach ist. Also das ist vom MDPV diese Nebenwirkung. Einfach weil man es dann zu lange nimmt. Halluzinationen, Wahnvorstellungen, wahnhaftes suchen oder sich selbst verletzen, weil man dann denkt Sachen sind unter der Haut.“

Eidesstattliche Versicherung

Pietzschmann, Verena

Name, Vorname

Ich erkläre hiermit an Eides statt,

dass ich die vorliegende Dissertation mit dem Thema

Concomitant use of synthetic cathinones in opioid-dependent patients receiving opioid maintenance treatment

selbständig verfasst, mich außer der angegebenen keiner weiteren Hilfsmittel bedient und alle Erkenntnisse, die aus dem Schrifttum ganz oder annähernd übernommen sind, als solche kenntlich gemacht und nach ihrer Herkunft unter Bezeichnung der Fundstelle einzeln nachgewiesen habe.

Ich erkläre des Weiteren, dass die hier vorgelegte Dissertation nicht in gleicher oder in ähnlicher Form bei einer anderen Stelle zur Erlangung eines akademischen Grades eingereicht wurde.

München, 06.12.2018

Ort, Datum

Verena Pietzschmann

Unterschrift Doktorandin/Doktorand