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Empathy in High-Tech and High-Touch Medicine

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1. Introduction

1.1 Empathy in Medicine

1.1.1 Background: Relevance of Empathy in Medical Professions

As stated by Howard Spiro, former director of the Yale Program for Humanities in Medicine empathy in medicine “has always been and will always be among a physician’s most essential tools of practice. (...) Empathy is the foundation of patient care, and it should frame the skills of our profession” (1).

According to Jodie Halpern, associate professor at UC Berkeley, who has had a long-standing focus on empathy, clinical empathy includes not only the ability to imagine how an individual patient feels about a situation, but also to witness the patient’s perspective, as well as to cognitively, emotionally and fully understand. Due to the fact that a physician is also actively involved and not only an external observer, the empathizer has to be curious about the patient’s history and therefore is supposed to give resonance (2).

Empathy, an emotional skill, effectively enhances communication in medical practice. Emotions can help to understand the patient’s behaviour and circumstances, and thus influence beliefs and decisions. Hence, it is important for physicians to recognize and critically question feelings rather than trying to block them. Feelings risk irrationality, so it is of vital importance to question all emotions. Physicians are supposed to be able to interpret the patients’ body language in order to critically challenge their history; the physicians’ own feeling are never to be seen as a fact but as a helpful instrument to medical judgment (2).

Generally, a good physician-patient relationship is very beneficial for health outcomes (3, 4). Empathy can also be helpful for the healing process (1). The patient reveals more bits and pieces of information about her or his history and state (2), henceforth effective therapeutic ties can be established (5). An empathetic doctor also increases the patient's confidence (6), compliance (7, 8) and satisfaction in the physician-patient relationship (9, 10). In expressing empathy, the patient will feel well-understood by the clinician, which, once again, can ameliorate physical, mental, and social well-being (11). Furthermore, it proves beneficial in breaking bad news (12) and in avoiding lawsuits (13). Empathy's flip side is the possible violation of clinical objectivity and the need of physicians to dissociate personal life from work. Too much concern in physician-patient interaction - while neglecting personal needs - might trigger burnout symptoms, a widespread phenomenon among American surgeons (14). Recently, the higher burnout risk of "high-touch disciplines" in contrast to "high-tech disciplines" has been a subject of discussion (15). If a physician is too much involved he might lose her or his objectivity which in turn might lead to favouring certain patients (2). As a good physician-patient relationship creates more intimacy between them, it also includes the risk of emotional dependence. The patient trusts the clinician and gives him power and decision-making authority. The consequence might be that the patient will not take responsibility for herself and her healing process (3).

Clinical empathy might be therapeutic in understanding the emotions and points of view of a patient but not necessarily in having intense positive feelings towards the patient (2).

People are different - that is why patients also have varied emotional needs. Physicians should focus their therapy on the individual need of every patient: some patients want to know everything about their disease in order to accept their fates, others prefer to suppress the mere thought of it (2).

1.1.2 Previous Literature about Empathy in Medical Professions

A decline in empathy during medical school (16-18) and a regular female higher scoring in empathy measurements are frequently reported (17, 19), while changes of empathy with increasing practical experience are being discussed controversially (20, 21).

Looking more closely at the specialties, there are two reports on physicians in people-orientated specialties scoring higher on the JSPE than their colleagues in technology-orientated specialties (19, 22). An Italian sample survey on empathy, conducted among physicians, revealed that there was no significant difference between medical and surgical groups, just slightly higher scores in the medical group (23).

If empathy is so indispensable to medicine, what exactly does the word mean?

1.2 Definition of Empathy

Originally, the German word “Einfühlung”, meaning “to feel with” another person, pioneered the development of the term *empathy* (24).

Empathy is not consistently defined by different authors (7). It is a complex, multidimensional concept (25), which can be divided into four parts, consisting of a moral, cognitive, behavioural and an emotional component (26). It is not a purely emotional reaction which might lead to the danger of a too strong feeling of sympathy for the patient and therefore a loss of objectivity. None of the four components should be missed (25).

Cognitive empathy means that someone understands the perspective, the experience and the point of view of the respondent but without necessarily feeling compassion, objectivity must be preserved (25, 27).

Emotional empathy, on the other hand, means the sensation of an affective reaction which is caused by another person. There is compassion for and an emotional connection to that person (27).

The moral component means that there is an altruism that leads to the practice of empathy (26).

The responder can only benefit from empathy if the listener also expresses it. He is supposed to convey that he assimilates and understands what the respondent feels and experiences (25). Focusing on the behavioural component of empathy, it can be expressed through carefully chosen words, the right intonation and facial expression, via gesture and conduct (7). In short, one has to understand the conversational partner, but also to show one's understanding in a verbal and nonverbal way (20).

Our research group used three instruments for looking more closely to the different components of empathy. For the cognitive component, the Reading the Mind in the Eyes Test (RME-R test) (28) exists. The task in this "Theory of Mind" measurement (currently strongly associated with cognitive empathy) is to judge mental states only from expressions around the eyes. The Theory of Mind describes the capacity of a person to put oneself in someone else's shoes and to understand his or her mental state. We developed a shortened version consisting of six pairs of eyes (RME-R6) and with the self-assessing Balanced Emotional Empathy Scale (BEES) we observed the emotional part. The abbreviated BEES (29) consists of seven items (BEES-7) which probe the extent to which the respondent can feel the suffering of others or take pleasure in their happiness. The Jefferson Scale of Physician Empathy (JSPE) (30) which we used to specify the empathy in the context of the patient care is a self-assessment test that consists of 20 items dealing with physicians' behaviour.

The idea of *empathy* is not similar to *sympathy*. In the concept of *sympathy* the emotional component assumes a more important role (31). In contrast, *empathy* is more

an interaction of different concepts than only a feeling (25) and it is more neutral. Being *empathetic* means to understand the feelings of another person, while being *sympathetic* means to share emotions with the other person (31).

1.3 The Neural Correlate of Empathy

There are neuronal correlations of being empathetic which can be observed. Tania Singer, director of the Max Planck Institute for cognition and neuroscience in Leipzig, defines *empathy* as the capability to share feelings of others without being directly emotionally stimulated. If a person sees another person feeling pain, activations in the bilateral anterior insula and the rostral anterior cingulate cortex in the brain of the observer can be seen. These pain-related areas are activated whether the sufferer is a loved-one or an unknown, but likable person. The same areas are activated when the observer feels pain by himself (32, 33). There is neural activation in the primary and secondary somatosensory region as well as inhibitions in muscle-specific motor-evoked potentials when watching another person suffering (34-36). There are modulations of empathy depending on different factors like the intensity of the stimulation (37) or inter-individual differences (38). But if empathy arises when seeing another person in pain, what exactly is the empathy's significance in high-tech medicine the way it is today? Are there even similarities in empathy in different disciplines? We looked more closely at two specialities: surgery and psychiatry.

1.4 Choice of the Disciplines Surgery and Psychiatry

Empathy in medicine is an ambiguous concept: While the psychiatrists' technique of counter-transference in terms of genuine empathy (5) is useful for diagnostics, surgeons have to face a patient with multiple injuries and therefore might profit more from a clear mind than from a big heart. Historically, surgeons and psychiatrists have been described

as two contrary kinds of professions: those healing by hand, and those healing by word (39). Time is required to listen to patients, to see their emotional nonverbal signals and to express empathy (1). There is a need to focus attention on the patient. This time might be more available for psychiatrists (5) than for surgeons, as the major task of psychiatrists lies in contact with the patient and the patient-physician relationships may last longer. Meanwhile surgeons heal by operating which is obviously more of a physical act than a conversation. In highly developed countries such as Germany the main focus of acute medicine in surgery is on technical and medical treatment while the focus of acute psychiatry is in talking and medication. What is more, the interpersonal interaction might tend to be more important for a positive outcome in treatment of chronic disease and long-lasting treatments of psychiatric illness (7).

Even though, it remains unclear whether there are more differences than similarities between the probably most diverging medical specialties: psychiatry and surgery. Although empathy is seen as epitomizing psychiatrists, it is definitely useful for surgeons for breaking bad news or elucidating an upcoming operation. Moreover, a surgeon can attenuate or even prevent a chronic development through acting empathic behaviour (7).

1.5 Hypotheses

The purpose of this study was to compare empathy in the two different medical specialties: surgery and psychiatry (stereotypically considered to be highly divergent), taking into consideration the physicians' sex, their experience and career choices as influencing factors on clinical empathy, measured by three different instruments (JSPE, RME-R6, BEES-7). Furthermore, the correlation of these measurements was to be verified.

The following hypotheses were to be tested:

1. Surgeons and psychiatrists show heterogeneous results in different empathy instruments: empathy in the context of patient care (JSPE), in cognitive (RME-R6) and emotional empathy (BEES-7).
2. Measurements of general cognitive (RME-R6) and emotional (BEES-7) empathy both correlate with the physician-specific JSPE.
3. The physicians' sex, their professional experience and career choices are factors influencing empathy scores.

2. Method and Materials

2.1 Participants

We invited every physician of the staff of the Department of Psychiatry and Psychotherapy and the Department of Surgery, campus Innenstadt, at the Ludwig-Maximilians-University in Munich (60 surgeons, 58 psychiatrists) to take part in our study. Based on the effect size $d=0.66$ observed in Hojat et al. (19) for the difference between psychiatrists and general surgeons on the JSPE, a sample number of 38 physicians of each specialty was predicted to detect such a difference with a statistical power of 80% and a significance level of 5%. In total, 112 questionnaires were returned. Of these, four questionnaires lacked the attribution to the specialization surgery/psychiatry; in two other questionnaires the category of sex was missing. So, those six questionnaires were excluded from the whole analysis. The remaining 106 questionnaires were appropriately completed according to the authors' instructions (28, 29, 40), and included 56 surgeons (14 (25%) women and 42 (75%) men), and 50 psychiatrists (25 (50%) female and 25 (50%) male).

2.2 Survey Instruments

2.2.1 The Jefferson Scale of Physician Empathy (JSPE)

We used this questionnaire as a measurement for empathy in the context of patient care. The original JSPE was created as a means of rating the attitudes of students towards physicians' empathy (the "S" version) (30). By slightly modifying the test, a revised version of the JSPE was developed (the "HP" version) for measuring empathy behaviour of physicians and health professionals in patient-care situations. It emphasizes clinicians' empathetic behaviour during patient encounters more than their empathetic attitude. It contains 20 items, ten positively and ten negatively formulated, with a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree) for responding to each item in the instrument. Negatively worded items were used for avoiding the "acquiescence bias". The score for each item was summed up to the total score after having inverted the ten negative items. Thus, a higher score on the scale indicates greater empathy. The questions can be classified in three components with eigenvalues more than one (4.2, 1.5, and 1.3). The first factor is named "Perspective Taking", the second "Compassionate Care" and the third one "Standing in the Patient's Shoes" (30). To enable us to compare the results of our studies with results of other studies using the JSPE (for example our research on empathy in Munich's first-year medical students, Dehning et al, submitted 2013), we decided to keep all questionnaires in English. An example reads as follows: "Because people are different, it is difficult for me to see things from my patients' perspectives" (an item which has a negative factor structure coefficient) (30, 41).

2.2.2 The Shortened Version of the Reading the Mind in the Eyes Test Revised (RME-R6)

We used this questionnaire as a measurement for cognitive empathy. The original version of the RME-R test (28) consists of 36 photographs depicting only the eye region of Caucasian individuals. The task is to judge mental states from expressions around the eyes alone as an index for Theory of Mind capability. So far, it has been applied to several different populations, mentally healthy as well as ill subjects (42-45), so that a rectangular area of approximately 5 x 2 inches delineates the eye region of grown-up men and women, encompassing the entire width of the face from midway up the nose to right above the brow. Four descriptions of mental states (one target word and three foils) are presented at each corner of the photograph; the challenge is to choose the adequate facial expression for the eyes pictured. It is an intuitive measurement not allowing a socially desirable answer. The English version of the RME-R (28) test was used. A detailed annex explaining all the terms listed in the test using synonyms and example sentences was also appended in English.

To make the RME-R test more applicable for busy physicians, we developed a shortened version with only six photographs of eye regions, each showing a mental state (Figure 1). The choice of these six pairs of eyes (four men, two women) out of 36 was based upon an item-response analysis of results from a former study on the application of the RME-R test to first-year medical students (Dehning et al., submitted 2013). The estimated item-discrimination and item-difficulty parameters of the Birnbaum model (with guessing parameters fixed at 25%) permitted the selection of six highly discriminative items ranging from very easy to very difficult. The six mental states in the RME-R6 are “desire”, “hostile”, “contemplative”, “accusing”, “defiant”, and “concerned”.



Figure 1: The shortened version of the Reading the Mind in the Eyes-Test-Revised (RME-R6 test)

2.2.3 The 7-item Version of the Balanced Emotional Empathy Scale (BEES-7)

We used this questionnaire as a measurement for emotional empathy. The full-length BEES consists of 30 items. Since we used several questionnaires and as it would have taken about ten minutes for a native English speaker to complete the BEES, we therefore used the short version. The abbreviated BEES-7 (29) is a reliable and valid instrument (46) consisting of seven items (three positively and four negatively worded to avoid “acquiescence bias”) that measures responses to fictional situations and particular life events. The answer scale ranges from -4 to +4 and it tests the extent to which the respondent can feel the suffering of others or take pleasure in their happiness.

Subjects report the degree of their agreement or disagreement with each of the seven items using a 9-point Likert scale. After inverting the negative items, the scores are summed up. Higher scores represent higher levels of emotional empathy. An example of a BEES item: “I cannot feel much sorrow for those who are responsible for their misery” (negatively worded item) (29).

2.2.4 Personal Characteristics

To measure personal characteristics, we chose questions on sex, age group, years of professional experience, satisfaction with the choice of profession, future career plans (university versus non-university versus private practice), preferred task at work (clinical work versus research versus teaching), sub-specialization (for psychiatrists: analytical or behavioural; for surgeons: general, traumatic, plastic, or vascular surgery), and a question for self-evaluation of being empathetic (answers on a 10-point Likert scale). As being curious and open-minded that concerns learning new things is important for being empathetic (2), we also asked the physicians to rate their own curiosity (answers were on a 10-point Likert scale).

Fourteen of 50 psychiatrists (28%) had an analytic psychology education, 30 (60%) a behaviour therapy education. One had both specializations. Five did not mention their education. Thirty (54%) surgeons were specialized in trauma surgery, ten (18%) in general/ visceral surgery, eight (14%) in plastic and five (9%) in vascular surgery, five had another specialization. For detailed sample description see Table 1.

Table 1: Sample Description and Comparison of Psychiatrists and Surgeons

		Overall (n = 106)	Psychiatrist (n = 50)	Surgeon (n = 56)	p-value
Sex	male	67 (63%)	25 (50%)	42 (75%)	0.0092
	female	39 (37%)	25 (50%)	14 (25%)	
Age group*	<30 years	22 (21%)	10 (20%)	12 (22%)	0.71
	<40 years	60 (57%)	30 (60%)	30 (55%)	
	<50 years	12 (11%)	8 (16%)	4 (7%)	
	<60 years	10 (10%)	2 (4%)	8 (15%)	
	<70 years	1 (1%)	0 (0%)	1 (2%)	
Professional experience	<1 year	13 (12%)	9 (18%)	4 (7%)	0.13
	<2 years	12 (11%)	5 (10%)	7 (12%)	
	<5 years	26 (25%)	12 (24%)	14 (25%)	
	<10 years	28 (26%)	15 (30%)	13 (23%)	
	>10 years	27 (25%)	9 (18%)	18 (32%)	
Re-election of profession	yes	95 (90%)	46 (92%)	49 (88%)	0.53
	no	11 (10%)	4 (8%)	7 (12%)	
Future career plans**	university career	69 (66%)	30 (60%)	39 (72%)	0.044
	change to a non-university hospital	9 (9%)	2 (4%)	7 (13%)	
	physician in private practice	21 (20%)	15 (30%)	6 (11%)	
	other	5 (5%)	3 (6%)	2 (4%)	
Preferred task at work***	clinical	82 (80%)	33 (67%)	49 (92%)	0.0024
	research	16 (16%)	12 (24%)	4 (8%)	
	teaching	4 (4%)	4 (8%)	0 (0%)	

*One participant failed to give his age

**Two participants did not reveal their future career plans

***Four participants did not name their preferred task at work

2.3 Procedures

Ethical approval of the study was granted by the Institutional Review Board of the Medical Faculty of the Ludwig-Maximilians-University, Munich. From April 15, 2011 to June 6, 2011, the questionnaires were distributed to surgeons and psychiatrists. A brief explanation of the study was given and the questionnaires were filled out by the physicians, who voluntarily decided to participate in the study. In average they took 15 minutes to complete the questionnaires. The questionnaires were anonymous, but participants were encouraged to use a pseudonym in order to learn about their individual results later. To ensure anonymity, we used a box in which the physicians could return their completed questionnaires. After the analysis of the results, the participants were invited to review their pseudonymised scores on a web page.

2.4 Statistical Analyses

The usual descriptive statistics were reported as N (%) or mean \pm standard deviation unless otherwise stated. Simple group comparisons were conducted using *Fisher's exact test* or *Welch's t-test* whenever appropriate. Partial correlations between measurements of empathy were calculated adjusting for sex and specialty.

The influence of personal characteristics on the JSPE was evaluated using ANOVA adjusting for sex and specialty. The reported *p*-value refers to the F-test (type II) of the personal characteristic's effect. In a second multivariate approach to identify influencing factors, a regression tree (47) was estimated to validate the findings of the multi-way ANOVA models.

All analyses were performed using the statistical software environment R 2.13.2 (48).

Missing values in the JSPE and BEES-7 questionnaires were imputed by means of the remaining items (there was never more than one item missing in the questionnaires

handed in). In the RME-R6 test, missing answers were interpreted as wrong, i.e. the participant did not recognize the emotion. In two questionnaires of the JSPE and in one of the RME-R one item was missing and in the BEES-7 questionnaire three participants did not answer one of the seven questions. Remarkably it was always item seven which was not answered. It might be caused by language problems (“to rub off on me”).

3. Results

There were different sex ratios in the two specialties (42 male and 14 female surgeons, 25 male and 25 female psychiatrists) in our sample ($p=0.0092$). The empathy-related analyses are therefore stratified or adjusted according to sex. Asked for career aspirations (university career versus change to a non-university hospital versus working in private practice) more surgeons were planning a university career ($p=0.044$). Additionally, more surgeons preferred clinical work when asked about their preferred task at work (clinical work versus research versus teaching) ($p=0.0024$). With regard to self-evaluation of empathy and curiosity, surgeons rated themselves as being substantially more curious than psychiatrists (mean 8.1 versus 7.2), $p=0.00099$, whereas there was no difference in self-rated empathy ($p=0.24$). There was no significant correlation between the ratings of empathy and curiosity. The Spearman correlation between the self-rated empathy and curiosity was 0.36 for male psychiatrists ($p=0.080$), 0.13 for male surgeons ($p=0.422$), -0.05 for female psychiatrists ($p=0.823$) and 0.52 for female surgeons ($p=0.059$).

For further sample description see Table 1.

3.1 The Jefferson Scale of Physician Empathy (JSPE)

Cronbach's alpha for this scale was 0.85 with 95%-confidence interval of 0.80-0.89 in our sample. As the effect of sex in both groups of physicians and the effect of groups in both sexes was different, no global sex effect or group effect was assessable.

Male psychiatrists scored significantly higher than male surgeons (118.0 ± 9.86 vs. 107.5 ± 13.84 ; $p=0.0006$). There was no such difference ($p=0.72$) between female psychiatrists (115.4 ± 14.19) and female surgeons (114.1 ± 7.16) (Table 2). The *t*-test for the difference between females and males revealed a *p*-value of $p=0.45$ for psychiatrists, but $p=0.025$ for surgeons.

Table 2: Results of the JSPE (M \pm SD)

	Surgeon	Psychiatrist	<i>p</i> -value*
Male	107.5 ± 13.84	118.0 ± 9.86	0.0006
Female	114.1 ± 7.16	115.4 ± 14.19	0.72

Note: **p*-value for the comparison of the two specialties

3.2 The Shortened Version of the Reading the Mind in the Eyes Test Revised (RME-R6)

Cronbach's alpha for the shortened version of the RME-test was 0.45 with a 95%-confidence interval from 0.26 to 0.60 in our sample. As the effect of sex in both groups of physicians and the effect of groups in both sex seemed to be different, no global sex- or group effect was assessable.

Male psychiatrists identified 4.6 ± 1.32 (mean \pm SD) out of six photographs correctly, and female psychiatrists 4.1 ± 1.26 . Male surgeons identified 4.0 ± 1.60 out of six correctly, and female surgeons 4.5 ± 0.94 (Table 3). There was no sex influence among either psychiatrists or surgeons ($p=0.13$ for psychiatrists, $p=0.15$ for surgeons), and no statistically significant difference between the specialties in detecting the correct mental state of each pair of eyes.

Table 3: Results of the RME-R6 (M \pm SD)

	Surgeon	Psychiatrist	p-value*
Male	4.0 ± 1.60	4.6 ± 1.32	0.071
Female	4.5 ± 0.94	4.1 ± 1.26	0.25

Note: *p-value for the comparison of the two specialties

The RME-R6 is a multiple-choice test with four possible responses. If someone does not know the answer, he has a 25% chance of guessing the right option. That is why we used a 3 parameter Birnbaum model and found that ‘defiant’ was the most difficult picture. It ranged in downwards order before “accusing”, “desire”, “hostile” and “contemplative”. Meanwhile, “concerned” was the pictured expression that could be recognized most easily.

3.3 The 7-item Version of the Balanced Emotional Empathy Scale (BEES-7)

Cronbach's alpha for the BEES-7 scale in our sample was 0.51 with 95%-confidence-interval of 0.33 to 0.64. Taking a closer look at the subgroups, alpha was 0.29 for surgeons but 0.69 for psychiatrists.

Among psychiatrists, females scored 11.8 ± 6.54 , and males 10.0 ± 9.49 . Female surgeons scored 13.8 ± 6.78 ; male surgeons 8.3 ± 6.18 (Table 4). As the interaction between sex and specialty was not significant in the saturated 2-way ANOVA, main effects were assessable, showing a significant sex effect with female physicians scoring higher than males ($p=0.025$) but revealed no evidence for a difference between psychiatrists and surgeons ($p=0.80$).

Table 4: Results of the BEES-7 ($M \pm SD$)

	Surgeon	Psychiatrist	p-value*
Male	8.3 ± 6.18	10.0 ± 9.49	0.43
Female	13.8 ± 6.78	11.8 ± 6.54	0.38

Note: *p-value for the comparison of the two specialties

3.4 Partial Correlations between Measures of Empathy

Taking the three measurements of empathy together, the partial correlations between the JSPE, RME-R6, and 7-item BEES were calculated adjusting for sex and specialty. Both the RME-R6 and the 7-item version of the BEES correlated positively with the JSPE

(BEES-7 - JSPE: $r_p=0.46$, $p<0.0001$; RME-R6 - JSPE: $r_p=0.31$, $p=0.0011$). The 7-item BEES and the RME-R6 did not show a significant partial correlation ($r_p=0.10$, $p=0.33$). The self-rated empathy correlated positively with the 7-item BEES ($r_p=0.43$, $p<0.0001$) and the JSPE ($r_p=0.34$, $p=0.00033$) but no significant correlation was found for the RME-R6 test ($r_p=0.11$, $p=0.26$).

3.5 Influence of Personal Characteristics

The ANOVA for the psychiatrists' therapeutic specialization revealed a significant difference, with analytically trained psychiatrists scoring higher in the JSPE than behaviourally trained psychiatrists (F-Test: $p=0.024$). In the BEES-7 no significant differences between the two groups were observed ($p=0.18$). The reduced RME-R6 was too imprecise to retrieve any differences between the few analytically trained (14) and the behaviourally trained (30) physicians. One physician had both qualifications and was thus ignored for this comparison. The many subspecialties among the surgeons yielded small groups, necessitating a pooled comparison which did not reveal any evidence for group differences.

Next to sex and specialties we adjusted linear models of the JSPE and the BEES-7-scale to categorical variables (age and professional characteristics) as possible influencing factors on empathy.

For different age groups p was 0.63 in the JSPE and p was 0.02 in the BEES in the F-test. There were undirected group differences. Taking professional experience into account p was 0.44 in the JSPE and p was 0.06 in the BEES in the F-test, but there were only unsigned group differences, just as in the age groups. Regarding the influence of future career plans (university career: $p=0.13$ in the JSPE, $p=0.29$ in the BEES versus the other plans: $p=0.43$ in the JSPE, $p=0.3$ in the BEES), and preferred task at work

(research as preferred task: $p=0.13$ for the JSPE, $p=0.91$ for the BEES), no significant differences in empathy scales in the various groups could be observed.

To summarize, there was no evidence for influence from any other personal characteristic on empathy (age group, years of working experience, future career plans, and preferred task at work).

The regression tree (Figure 2) for the JSPE demonstrates the main difference with regard to the specialty (psychiatry versus surgery) and the trend of a higher scoring of female surgeons versus male surgeons with no significant link to other features. Thus, empathy as assessed by JSPE did not increase with age and experience and was not influenced by individual career choices.

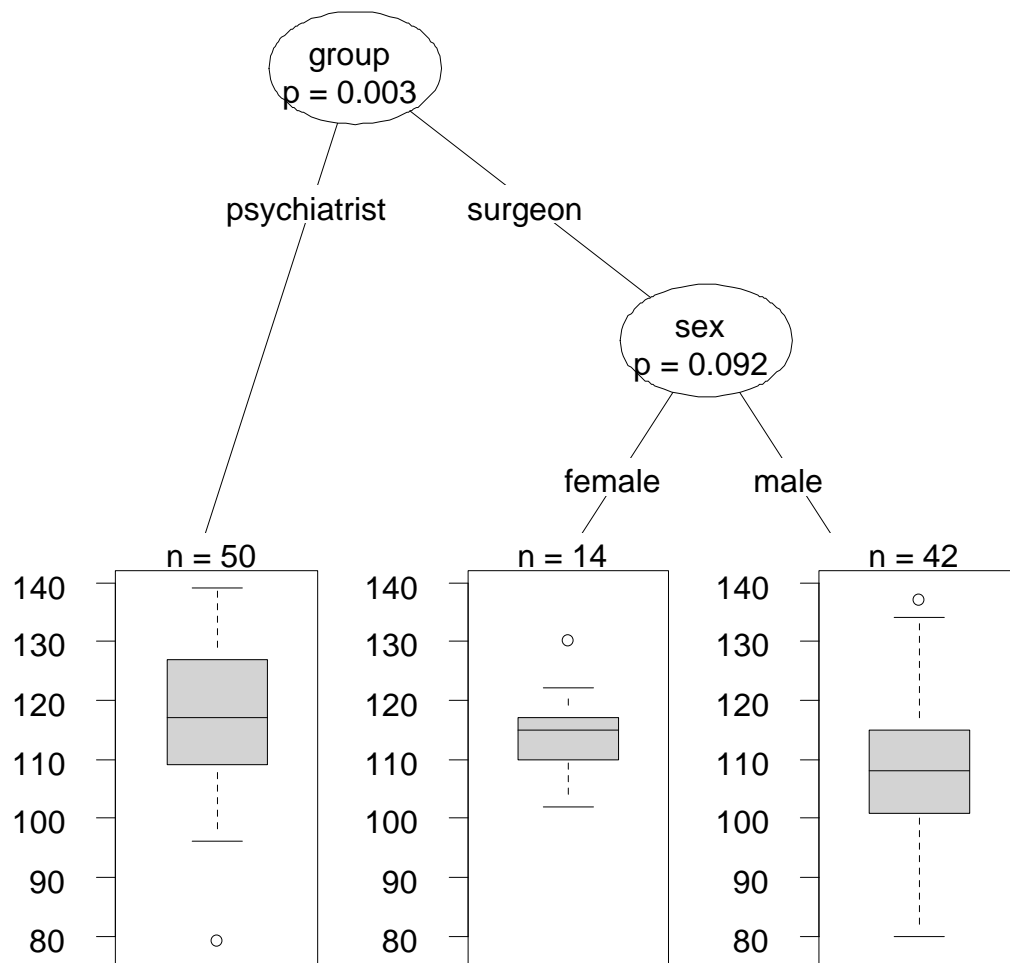


Figure 2: Regression tree for the Jefferson Scale of Physician Empathy with main differentiation with regard to specialty

Meanwhile, the regression tree (Figure 3) for the BEES-7 (the scale for emotional empathy) shows higher scores of female physicians compared to male physicians regardless of their specialty. Similarly, there was no significant link to other personal characteristics.

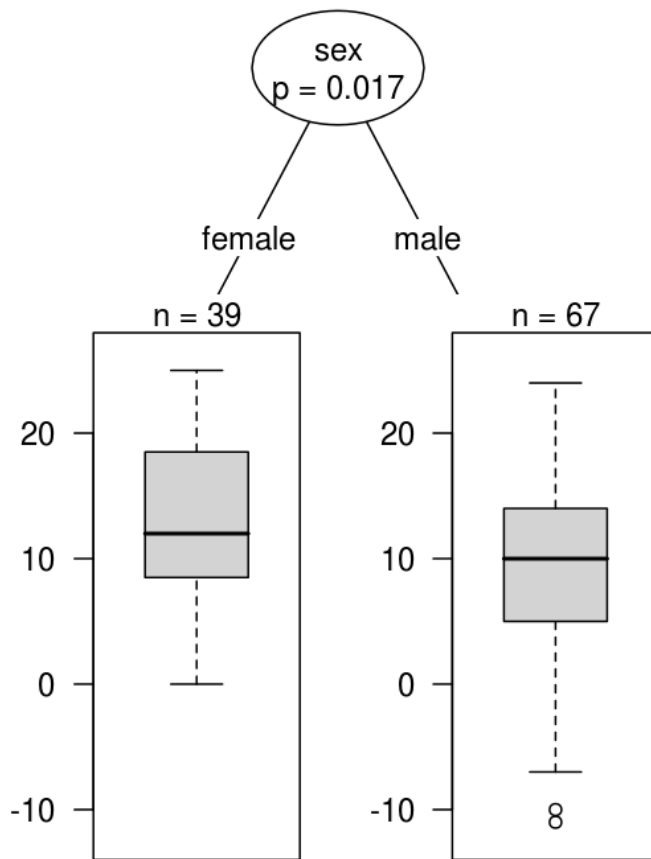


Figure 3: Regression tree for the shortened version of the Balanced Emotional Empathy Scale (BEES-7)

4. Discussion

The purpose of this study was to compare empathy in different components (emotional and cognitive empathy, as well as empathy in the context of patient-care) in the two different medical specialties, surgery and psychiatry, and to explore sex, professional experience and further characteristics of the physicians as influencing factors on empathy. This study is the first to apply different empathy measurements in order to approach the construct of empathy in the context of patient care, and cognitive as well as emotional empathy.

4.1 Answers to the Hypotheses

4.1.1 Answer to the First Hypothesis

“Surgeons and psychiatrists show heterogeneous results in different empathy scales: empathy in the context of patient care (JSPE), in cognitive (RME-R6) and emotional empathy (BEES-7).”

In the JSPE the main finding was a higher score of male psychiatrists in comparison with male surgeons. Male psychiatrists, particularly the ones with an analytical specialization, seemed to score higher in this measurement focusing on empathy in the context of patient care.

In contrast, the RME-R6 measuring cognitive empathy did not reveal significant differences between surgeons and psychiatrists. This test does not focus on empathy in patient care, but on general cognitive empathy.

In line with the results of the RME-R6, the BEES-7 measurements did not show any significant differences between the two specialty groups.

Male psychiatrists scored higher than male surgeons in the JSPE while they did not show any significant differences in the other two scales. The results are in line with our first hypothesis of empathy divergence between surgeons and psychiatrists in scales measuring different constructs of empathy.

The JSPE attaches importance to the perspective-taking of the physician, the ability to stand in the patient's shoes, and to compassionate care (30). For example, the statement, “An important content of the relationship with my patients is my understanding of their emotional status as well as that of their families”, reflects a skill a psychiatrist strongly benefits from to better understand the patients’ world. Analytical psychiatrists in particular use countertransference as a therapeutic technique which has

been strongly connected with genuine empathy (5). Consequently, analytical psychiatrists might imperatively score higher in the JSPE.

If we take the results of the different measurements into account, the difference between surgeons and psychiatrists was not as great as prejudice might have predicted.

4.1.2 Answer to the Second Hypothesis

“Measurements of general cognitive (RME-R6 test) and emotional (BEES-7) empathy both correlate with the physician-specific JSPE.”

The measurements of the two general empathy forms, the general cognitive (RME-R test) and the general emotional (BEES-7) empathy correlated with the physician-specific JSPE (RME-R6-JSPE: $p < 0.0001$, BEES-7-JSPE: $p = 0.00109$) which is a finding in line with the second hypothesis.

This strengthens the hypothesis of the specificity of the applied measurements.

4.1.3 Answer to the Third Hypothesis

“The physicians’ sex, their professional experience and career choices are factors influencing empathy.”

Women scored higher than men in the BEES-7, a result which was also found in earlier studies on empathy in patient care (19, 21, 23). More male medical students chose their field of study because of their expectation to earn good money (49). The women’s motivation for choosing medicine was more likely to be altruistic (50). As this is a pro-social behaviour altruistic people might be more empathetic. The growing number of female practitioners in medicine might contribute to a higher scoring in empathy measurements in the future.

We showed a difference on JSPE scores between analytically-oriented versus behaviourally-oriented psychiatrists which is a new finding. It is speculative to discuss

the possibility of more relevance of cognition process to analytical versus behavioural approaches in psychotherapy.

Regardless of the measurement, the relationship between empathy scores and professional experience was not statistically significant. In contrast to other authors, we did not find an influence of other factors such as age, years of working experience, future career plans, or preferred task at work (clinical work versus research versus teaching). Therefore, empathy might not necessarily be learnt at work, but rather is developed earlier in life. This might contradict our perception of physicians who prefer clinical work and are therefore more empathetic than those in research due to interest in social interactions.

Those results disprove our third hypothesis, because the physicians' sex affects the ratings in empathy scales, indeed, but the physicians' professional experience and career choices are not associated with empathy.

4.2 Comparison with Empathy Scores of Undergraduates

Dehning et al. (submitted 2013) found that first-year medical students who preferred a specialization with technical orientation already scored lower in empathy scales than their colleagues seeking people-orientated specialization, indicating a possible continuity of empathy at the beginning and throughout professional training.

We compared the results of Munich's first-year medical students with our results of Munich's surgeons and psychiatrists and identified no clear difference in empathy scales either. The students had completed the BEES-7 as well as the RME-test. It was only in the RME-test that male physicians scored significantly higher than same-sex medical students. There was only a slight difference between the female students and female physicians ($p=0.097$). In the BEES-7 we found no significant differences between students and physicians. These results suggest that there was no empathy

change during medical school, but rather that the empathy level has already been developed beforehand. One reason could be that medical schools might set more value on acquiring theoretical specialized knowledge than enhancing empathy skills through training.

4.3 Comparison with Other Studies

Comparing our results with other studies, there are three reports differentiating between people-orientated and technology-orientated specialties (19, 22) respectively medical and surgical groups (23) using the JSPE as a measurement for empathy. All found a trend to higher scores in the “people-orientated” (23) specialties (for example psychiatry, family medicine, paediatrics (19)). Our study was the first to apply different measurements for empathy in physicians. A wider view using different instruments revealed that doctors appeared to be more alike than different.

In four studies that used the JSPE (19, 21-23) a tendency to higher scores of females in sex comparisons was observed which is in line with our results. For potential reasons see the section above “4.1.3 Answer to the Third Hypothesis”.

The surgeons in our study had a mean empathy score of 109.2 (SD: 12.78) the psychiatrists a mean score of 116.7 (SD: 12.17) in the JSPE. The physicians in our study reached no explicit different scores to those from Korea (98,2, SD: 12,0) (22), Iran (110,1, SD:13,6) (21), Italy (115.1, SD:15.55) (23) and America (120, SD:12) (19).

One reason for slightly different rankings might be the use of the English scale in our study. For a better comparison with the results of Munich students, who also used the English version, no translation was given. The other four studies, however, used questionnaires in the subjects’ native language.

The physicians of our study who are of Western civilization might have slightly different scores in empathy scales to Korean and Iranian physicians because of cultural differences. It raises the question in how far myriad medical systems influence the scores in empathy scales. Iran and Korea are two countries where more hierarchical structures exist in medicine (22) than in the Western civilization, with patients having different expectations of their physicians. In those countries paternalistic doctor-patient relationship may be frequent, while in Germany the physician-patient relationship emphasizes shared decision-making, an interpretive model or patient autonomy. These are terms and conditions that may contribute to slightly different empathy scores.

When comparing our results of the BEES with the BEES norms (6.2 for men, 14.3 for women) (Mehrabian, 1997) we found small differences: the women in our sample group had lower empathy scores, the men higher empathy scores.

4.4 Limitations

A main limitation of this study is that it was possible to answer in a socially desirable way in the JSPE and the BEES-7. This was not the case in our third scale, the RME-R6. Moreover, the JSPE and the BEES-7 are tests based on the participants' self-assessments, which might have led to subjective data. It is questionable if the patients' impression about physicians' empathy is more important than the physicians' point of view (51). A doctor might rate himself as being very empathetic while the patient has a different opinion.

One disadvantage of the RME-R6 test is that the participant only sees static photos of different eyes (28). In reality one can observe the action of mimic muscles to decide about the emotional state of a person. The consequence may be that it was harder to guess the different emotions in the RME-R6 test than it is in reality. But it was equally difficult for every participant, so the scale ratings were comparable. Furthermore, the

images show Caucasian faces, this could be a disadvantage for those physicians who work in Germany but are of other origins. Another problem was that the RME-R6-test only consisted of six eyes in order to make the test more practical for busy physicians. That led to the fact that the test was not very precise. We could not use the test to compare the analytical and behaviour therapy psychiatrists because the subgroups were too small.

It is indispensable to point out that low empathy scores do not necessarily mean that someone is less empathetic, because all scales only test one concept of empathy and the sample size was small in some comparisons (for example if we compare analytically trained psychiatrists with those who profited from a cognitive behavioural therapy).

Another aspect was that we used the original versions of the three different tests, all of which were in English language. There could have been some language barriers. For example in the BEES-7 it might be that not all participants understood correctly the meaning of item seven. This could have skewed the results and led to lower scores.

Lower reliability was found in the RME-R6 test, because the Cronbach's alpha in our study was only 0.45.

Another limitation with regards to our study was that we handed out the questionnaires in only two university departments in Munich. This might not be representative for all of Munich's surgeons and psychiatrists and even less for all members of those professions in the whole of Germany. The results might have come about due to training sessions or certain focal points in the culture of the two departments.

Moreover, we had a small sample group with different ratios of sex in the two subgroups. For example, only 14 female surgeons took part. But we always considered the results of the different sex separately in order to minimize this problem.

We asked all the available physicians in the two departments to take part in our study, even though participation was voluntary. It might be that only those participated who were already interested in empathy, which also could have biased the results. Because of research commitments, illness, rotations and vacations, it was not possible to reach all the physicians.

4.5 Future Prospects

4.5.1 Empathy Training for Physicians

When we compared physicians' empathy with students' empathy, we detected few changes in empathy scores during medical school (cf. section 4.2). Also, different duration of professional experience was not associated with differences in empathy scores (cf. section 4.1.3). We should focus more on empathy training for physicians and medical students in order to increase the satisfaction of both, patient and physician. The training is still in its infancy. The faculty established communication training with actors and video feedback. Also, courses can be taken by physicians, in which patient-physician/medical student conversations can be seen in order to improve communication skills. Further research has to be done to learn about the dimension of effects of medical training on empathy.

High-tech developments in modern medicine are not necessarily associated with high-touch developments. Nowadays, doctors are overtired because of excessively long working hours. Valuable time and energy for intensive care for patients, for talking about his or her fears concerning therapy and for expressing empathy towards the patient is lost. It is important to train using empathy though being pressed for time.

4.5.2 Empathy in Other Specialties

We have examined the differences between surgeons and psychiatrists. Further research should be done into other specialties as well. Oncologists or physicians working in palliative care for example have to work with patients who will probably die in the near future. The physicians should be trained to deal in a sensitive way with those people. It is a tightrope walk between being empathetic and not getting too much involved in order to protect themselves. Further research is needed concerning to what extent the variations of empathy scorings in different specialties can be generalized and which component of empathy is useful for which specialization.

5. Summary

The purpose of this study was to compare empathy in the two different medical specialties, surgery and psychiatry (stereotypically considered to be highly divergent). This study is the first to apply different instruments in order to approach measures of empathy in the context of patient care as well as cognitive and emotional empathy.

The participants in the study were 106 doctors (56 surgeons, 50 psychiatrists). Three survey instruments were used: The Jefferson Scale of Physician Empathy (JSPE) measuring empathy in the context of patient care, a shortened version of The Reading the Mind in the Eyes Test Revised (RME-R6) as an indicator for cognitive empathy, and the 7-item version of the Balanced Emotional Empathy Scale (BEES-7) for emotional empathy.

The main finding of this study is that male psychiatrists scored higher in the JSPE in comparison to male surgeons, measuring empathy in the context of patient care. No significant differences were found in the two measurements for emotional (BEES) and cognitive (RME-R6) empathy.

As the JSPE items reflect psychiatric skills to a great extent, psychiatrists might perform better in this area and therefore more similarities than differences can be assumed between surgeons and psychiatrists. Further research should be done in order to find out to what extent physicians' empathy can be trained in order to increase the satisfaction of both, patient and physician.

6. Zusammenfassung

Ziel unserer Studie war es, die Empathiefähigkeit von Ärzten zweier unterschiedlicher medizinischer Fachrichtungen, der Chirurgie und der Psychiatrie (stereotypisch sehr gegensätzlichen Fachrichtungen), zu vergleichen. Wir haben in unserer Studie erstmals verschiedene Messinstrumente angewendet, um das Konstrukt der „klinischen Empathie“ zu untersuchen. Wir untersuchten kognitive und emotionale Empathie, aber auch speziell die Empathie mit Fokus auf die Arzt-Patienten-Beziehung.

106 Ärzte nahmen an der Studie teil (56 Chirurgen, 50 Psychiater). Drei Messinstrumente wurden verwendet: Der “Jefferson Scale of Physician Empathy” (JSPE), der die Empathie-Fähigkeit in der Arzt-Patienten-Beziehung misst, eine Kurzversion des “Reading the Mind in the Eyes Test Revised” (RME-R6) als Messinstrument für die kognitive Empathie, und der aus sieben Elementen bestehende “Balanced Emotional Empathy Scale” (BEES-7) für die emotionale Empathie.

Das zentrale Ergebnis unserer Studie ist, dass die männlichen Psychiater im JSPE höhere Werte erzielten als die männlichen Chirurgen. Es fand sich kein signifikanter Unterschied in emotionaler (BEES) und kognitiver (RME-R6) Empathie.

Da die Fragen im JSPE vor allem das Tätigkeitsfeld des Psychiaters widerspiegeln, erklärt dies möglicherweise, warum Psychiater hier höhere Werte erzielten, sodass Chirurgen und Psychiater ähnlicher sein könnten als gedacht. Es sollte noch genauer untersucht werden, in welchem Ausmaß die Empathiefähigkeit von Ärzten trainiert werden kann, da dadurch die Zufriedenheit sowohl des Arztes, als auch des Patienten erhöht werden kann.

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8. List of Abbreviations

BEES	Balanced Emotional Empathy Scale
HP version of JSPE	Health professional version of Jefferson Scale of Physician Empathy
JSPE	Jefferson Scale of Physician Empathy
RME	Reading the Mind in the Eyes test
RME-R	shortened version of the Reading the Mind in the Eyes test
S version of JSPE	student version of Jefferson Scale of Physician Empathy

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10. Eidesstattliche Versicherung

Reiß, Eva (Kristina)

Ich erkläre hiermit an Eides statt,
dass ich die vorliegende Dissertation mit dem Thema

“Empathy In High-Tech And High-Touch Medicine”

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München, 18.12.2013

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