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Improving attitudes toward e-mental health services in the general population via psychoeducational information material: A randomized controlled trial☆

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ABSTRACT

Introduction: In recent years, effective Internet-delivered electronic (e-) mental health services have been developed to overcome the limited resources in face-to-face health care. For the successful dissemination of e-mental health services, individual predictors for their uptake and utilization need to be explored. For instance, little is known about the role of different information sources in attitudes toward Internet therapies. On the basis of technology acceptance framework, this pilot study aimed to identify differences in both attitudes and intentions to use e-mental health treatment services after providing psychoeducational information.

Methods: 439 participants (mean age 33 years, *SD* = 10.6 years; 72% female) were randomly assigned to one of three text-based information groups (neutral text: $n = 111$; expert evaluation: $n = 108$; user evaluation: $n = 112$) or a control condition (no information: $n = 108$). We assessed attitudes toward e-mental health treatments using a 15-item German e-therapy attitudes measure.

Results: Descriptive analyses revealed overall neutral attitudes toward Internet therapies. Ambivalent perceptions were found in terms of Perceived Usefulness (positive attitude) and Relative Advantage (negative attitude). The awareness of Internet therapies was rather low. Most participants evaluated self-help books, health websites and face-to-face counselling as more useful than web-based counselling and therapies and reported higher intentions to use conventional services in case of emotional problems. As hypothesized, variance analyses demonstrated that text-based information, especially expert evaluations, were associated with significantly more positive attitudes toward e-mental health treatment services compared to the control condition.

Conclusions: Taken together, this pilot study suggested a positive connection between the provision of general facts about e-mental health treatment services and attitudes as well as behavioral intentions to future use such services. However, a limitation was the omission of baseline attitudes assessment. Thus, further research is needed to gain deeper insights into the impact of information on attitudes.

1. Introduction

According to the WHO World Mental Health surveys, between 18.1 and 36.1% of the general population across different countries suffer from mental health problems at least once in a lifetime (Kessler et al., 2009). However, many persons with mental health problems do not receive professional help. One reason is the scarcity of therapeutic resources in primary care (Cavanagh and Millings, 2013). Electronic mental health (e-mental health) services appear to be a promising strategy to increase access to psychosocial care and reduce the gap between supply and demand (Lal and Adair, 2014).

The umbrella term “e-mental health” includes a wide range of digitalized services, such as psychoeducational information, electronic patient records, e-learning, screening, counselling, therapy, health promotion, relapse prevention and self-help. Generally, e-mental health is defined as the use of new media and modern communication technologies to maintain or improve mental health (Riper et al., 2010). In particular, Internet therapies, such as Internet-based cognitive behavioral therapy (iCBT), have demonstrated efficacy comparable to face-to-face therapies in the treatment of depression, anxiety disorders, stress, sleep disorders and eating disorders (Andersson et al., 2014). Several advantages of Internet therapies are assumed: They are supposed to reduce barriers regarding geographical distance and lack of services in remote areas (Barak et al., 2009; Lal and Adair, 2014), and

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they may expand accessibility by reducing time required to deliver care and by increasing the number of persons who can access services (Andrews et al., 2011). Because e-mental health services are accessible outside of usual business hours, these services can reduce time-related barriers and increase flexibility. Other suggested advantages of Internet therapies include less clinician time than traditional face-to-face therapies, cost-effectiveness (Donker et al., 2015), high treatment fidelity and structured content with same skills taught to manage symptoms (Titov, 2011). One of the barriers against face-to-face treatment is that many persons prefer to manage their symptoms on their own (Andrade et al., 2014). Hence, self-guided Internet-delivered treatments provide flexibility for patients. Furthermore, mental disorders are associated with stigmatization. The anonymity of the Internet reduces this barrier and provides a starting point to more intensive treatments (Berger, 2015).

These advantages and possibilities must be weighed against the risks and limitations of e-mental health. For instance, providers must pay attention to confidentiality and data security concerns (Maercker et al., 2015). Furthermore, competency and qualifications of online therapists can be difficult to determine for lay persons (Gieselmann et al., 2015). The role of therapeutic relationships in Internet therapies is also debated (Cavanagh and Millings, 2013). Additionally, required verbal and computer skills of patients as well as the “digital divide” are discussed as potential disadvantages of Internet therapies (Apolinário-Hagen and Tasseit, 2015). The implementation of e-mental health services, such as iCBT, into existing health care services is another perceived barrier among stakeholders (Topooco et al., 2017). A further limitation is the suitability of Internet therapies mainly for mild to moderate mental disorders (Berger, 2015).

Internet therapies have been already established in the public health sectors of some European countries like the Netherlands (Gieselmann et al., 2015; Topooco et al., 2017), or Australia (Titov et al., 2015). In Germany legal regulations currently permit therapies by psychotherapists or physicians delivered exclusively via the Internet (Maercker et al., 2015), and therefore only few studies have assessed public acceptance of and attitudes toward Internet therapies in Germany so far (Apolinário-Hagen et al., 2017a, 2017b).

Knowledge about possibly ambivalent attitudes toward e-mental health services, i.e., attitudes that contain both positive and negative appraisals (Ajzen, 2001), can help to understand the lack of use of such services. People often fail to implement their intentions for goal-promoting behavior (intention-behavior gap; Orbell and Sheeran, 1998). Moreover, after initiating the behavior they may be unable to maintain long-term behavior or habit (Rhodes et al., 2008). As one component of motivational processes, misperceptions, negative expectations and attitudes might impede the uptake or the efficient use of e-mental health services (Hennemann et al., 2016). For instance, on the one hand, a person could principally express a positive attitude about the helpfulness of an e-mental health treatment. On the other hand, the same person might show weak behavioral intentions to actually engage with this novel treatment, which can be based on additional concerns and low literacy. It is important to understand both acceptability and attitudes as determinants of behavioral intentions to use and actual utilization, because negative views can result in poorer uptake or slow dissemination of e-mental health services (Musiat et al., 2014).

Technology acceptance is defined as positive attitude toward a technical system based on cognitive assessment processes (Davis et al., 1989). According to the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003), the behavioral intention to use a specific technology is defined as the extent to which a person believes that the use leads to improved performance or favorable outcomes. Performance expectancy, including beliefs about usefulness and relative advantage of a technological innovation, is assumed to have the strongest influence on technology use. Further influencing factors are effort expectancies about the ease to use a system, and social influences by stakeholders. Expected performance and effort as well as social influence do not affect behavioral intentions, but the actual use of a technology. An effect on behavioral intentions to use technology is induced by facilitating conditions, like the extent to which organizational and technical structures support the use. The degree of influence of these determinants depends on the users' age, gender and experience with technology (Venkatesh et al., 2003). Concerning the uptake of e-mental health treatments, perceived usefulness or helpfulness and beliefs about their relative advantage compared to face-to-face therapies as well as intentions to use can be explored as indicators of public acceptability (Apolinário-Hagen et al., 2017a, 2017b).

Recent studies showed a lower acceptance of e-mental health services compared to traditional psychotherapy in the general population of different countries (Apolinário-Hagen et al., 2017a, 2017b; Eichenberg et al., 2013; Klein and Cook, 2010; Musiat et al., 2014). There is some evidence that the public acceptability of e-mental health treatment services depends on the degree of awareness of their existence and the quality of information available to patients and professionals (Musiat et al., 2014). Studies suggested that positive attitudes toward e-mental health services can be strengthened by providing brief information texts (Casey et al., 2013) or videos (Ebert et al., 2015). Expert evaluations in terms of scientific evidence and quality seals could also improve the credibility and image of e-mental health services, because most patients are not informed of these quality standards (Maercker et al., 2015). Although marketing campaigns from other contexts suggest persuasive effects of user testimonials, it remains unclear whether narratives facilitate the uptake of e-mental health services (Healey et al., 2017). Narrative (anecdotal) and scientific evidence are grounded in two different modes of thinking; with narrative user evaluations referring to the experiential system, and expert evaluations that provide scientific evidence addressing the analytical system (Keller et al., 2006). Narrative evidence, in terms of other patients' experiences, was found to significantly impact health communication (Bodemer and Gaissmaier, 2012). Given that affect and availability heuristics are relevant in the communication of benefits of a treatment (Keller et al., 2006), it appears likely that heuristic decisions based on narrative evidence (e.g., user testimonials) are also relevant for the decision to use innovative e-mental health services.

Thus, the aim of the present study was to explore associations between different types of information (neutral, expert, user vs. no information/control condition) and attitudes toward e-mental health treatment services in an online convenience sample of the general adult population in Germany. We assumed that (a) text-based psychoeducational neutral information, (b) neutral information with additional user evaluation, and (c) neutral information with additional expert evaluation are associated with significantly more positive attitudes toward e-mental health treatment services (Internet therapies) compared to a control group, which receives no information (Hypotheses 1–3). As research questions, we further investigated which information text type (neutral text alone, neutral text with expert evaluation, neutral text with user evaluation) has the strongest positive association with attitudes toward Internet therapies. Finally, we assessed which type of mental health service (online or telephone counselling, unguided or guided Internet therapy) is associated with the highest willingness to future use in the information groups (neutral text, expert or user evaluation) vs. the control group.

2. Method

2.1. Study design, recruitment and procedure

The present randomized controlled trial (RCT) included three intervention groups (IG) and one control group (CG). The independent variable was the information text type that consisted of four conditions: no information (CG) vs. three information groups (IG: neutral text and neutral text with additional user or expert evaluation; see Fig. 1). As dependent variables, attitudes toward e-mental health services and

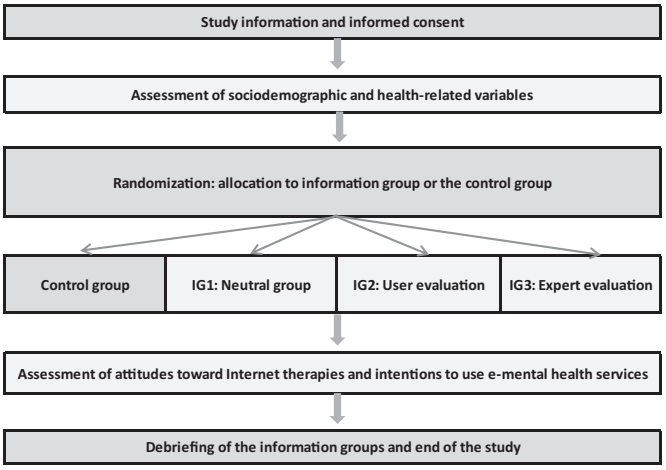

Fig. 1. Flow diagram of the study procedure.
Note: Abbreviation: IG = Intervention group.

intentions to use such services were assessed (post-intervention vs. control group). In this pilot study, no baseline assessment of attitudes or knowledge about mental health services was conducted. Participants were recruited via social network websites (Facebook, Xing; snowballing technique), personal networks, the website of the magazine "Psychologie Heute" [German "Psychology Today"], and the virtual laboratory as well as Moodle forums of the University of Hagen. Participants had to be at least 18 years old, be able to comprehend the instructions and provide informed consent. No institutional ethics approval was required for this non-clinical pilot study.

Participants completed the survey online (average completion time: 8 min). They were randomly assigned to one of the four groups via the software Unipark (Questback, Cologne, Germany). The equal allocation of respondents to the four groups was concealed (random trigger function generated by the software algorithm). There was no blinding of outcome assessors or personnel. Participants received a debriefing about their allocation after completing the study.

2.2. Measures and materials

2.2.1. Attitudes toward internet therapies

To assess attitudes toward Internet therapies, a 15-item version of the 17-item e-therapy attitudes measure (ETAM, version 2.0; Apolinário-Hagen and Vehreschild, 2016) was used. Two items of the original instrument were omitted a priori because their contents were not applicable to the scope of the present study. All items were worded as positive statements about possible advantages of Internet therapies. Participants indicated their agreement to the statements on a five-point rating scale ranging from 0 ("strongly disagree") to 4 ("strongly agree"). Previous factor analyses indicated a homogeneous multi-facet structure with two subscales (Perceived Usefulness, Relative Advantage). As a rule of thumb, mean values smaller than 1.5 can be interpreted as negative attitude, between 1.5 and 2.5 as neutral, and values > 2.5 as positive attitude (Apolinário-Hagen et al., 2017a, 2017b). The internal consistency of the overall scale (Cronbach's alpha: $\alpha = 0.89$) as well as for Perceived Usefulness ($\alpha = 0.83$) and for Relative Advantage ($\alpha = 0.87$) was moderate to high.

2.2.2. Intentions to use e-mental health services

Intentions to use e-mental health services were assessed in a similar, but abbreviated version of the procedure applied by Klein and Cook (2010). Participants in the present study were asked how likely they would use 10 different conventional and e-mental health services in case of emotional problems on a 5-point rating scale ranging from 0 ("very unlikely") to 4 ("very likely"). For the assessment of group differences in intentions to use e-mental health services, telephone counselling, online counselling, unguided and guided Internet therapy were selected based on a study by Casey et al. (2013).

2.2.3. Control variables

As control variables, age, gender, marital status, education level, employment status, profession in health care, experience with psychotherapy, counselling, online seeking of health information and experience with videoconferencing were assessed.

To determine attitudes toward psychotherapy in general as a control variable, participants reported their agreement to the statement "For longer lasting mental health problems one should, as with physical diseases, also seek professional help" (0 = strongly disagree to 4 = strongly agree; s.f. Albani et al., 2013).

2.2.4. Text material about e-mental-health

Different types of information about e-mental health were operationalized by three texts that differed with regard to the amount and source of information. All texts were presented in German. The three IGs received the same neutral text (see IG1, neutral condition), which was supplemented either with fictional user comments in IG2 (user evaluation) or information about a fictional scientific quality seal in IG3 (expert evaluation).

(I) IG1: In the neutral condition, general information about treatable conditions and types or delivery modes of Internet therapies was presented: "Internet-based psychotherapies, also called 'Internet therapies', include web-based treatment for persons with different mental health problems. They are used, for example, in mild to moderate depression, anxiety disorders or eating disorders. Possible forms are guided Internet therapies (online self-learning program with therapist assistance). Communication with the therapist takes place via e-mail or chat. Another form is the web-based psychotherapy, in which the patient and therapist communicates via webcam or videoconferences on fixed dates. An example of a provider of Internet therapies is MH-Online [fictitious provider of Internet therapies] that offers various guided Internet therapies (online programs with contact to a therapist) as well as web-based psychotherapy."

(II) IG2: In the condition of user evaluation, additionally to the neutral text, fictional user comments were presented as social models to induce emotional involvement regarding the helpfulness of e-mental health services. Fictional subscriber ratings were added in the form of stars and testimonials: "Participants who used the services of "MH-Online" were asked about their experiences: They evaluated the therapy forms altogether with 4 out of 5 stars".

★★★★☆ (98 reviews).

"Online therapy helped me. The program and the contact with my therapist worked well" (Petra, 35 years). "My experiences were positive. I would recommend MH-Online" (Sebastian, 46 years).

(III) IG3: In the third condition, additionally to the neutral text, expert opinion was operationalized as scientific evidence of the efficacy of Internet therapies and information on quality assurance to induce analytical information processing: "The effectiveness of Internet therapies has been proven by several scientific studies. The quality label of the "Deutsche Gesellschaft für Internettherapie e.V." [fictitious society] has been awarded for the services of MH-Online".

(IV) CG: No information text was displayed to the CG. There was only one page with the note "This page is blank for technical reasons."

2.3. Statistical analysis

Due to the reduction of the number of items, the structure of ETAM was reanalyzed via an exploratory factor analysis (EFA; main component analysis with promax rotation, Kappa, K = 4). Suitability of the items for the EFA was tested using the Kaiser-Meyer-Olkin (KMO) criterion and the Bartlett test. To determine the number of factors to be extracted, the Kaiser-Guttmann criterion with eigenvalues > 1.0 and

the Scree test were used. Differences between the information text groups vs. the control condition in attitudes toward e-mental health services (Internet therapies) were calculated using one-way ANOVA. Multivariate ANOVA (MANOVA) was applied to reveal differences between the information text groups vs. the control condition in the factors of the ETAM and the likelihood to use different help services. Partial eta-square (η_p^2) was used as a measure of effect size. Confidence intervals for η_p^2 and R^2 were calculated using the CI-R2-SPSS script (Wünsch, 2015). Effect sizes for correlation coefficients were classified according to Cohen's (1988) criteria. Only complete data sets were included in the analyses. All hypotheses were tested two-tailed at the significance level of $\alpha = 0.05$.

3. Results

3.1. Sample characteristics

Of the initial 527 data sets, 84 were excluded due to incomplete surveys. Two data sets were excluded because of unrealistically brief completion times and two further data sets because of > 10% missing values.

The final sample included 439 participants (CG: $n = 108$; neutral text: $n = 111$; user evaluation: $n = 112$; expert evaluation: $n = 108$). The mean age of the participants was 33 years ($SD = 10.6$ years, range: 18–75). The sample consisted of significantly more females than males (see Table 1). Most of the respondents had no previous experience with Internet therapy (91%) or conventional face-to-face psychotherapy (66%). Concerning psychotherapy in general, participants reported overall positive attitudes ($M = 3.7$, $SD = 0.61$). Nearly half of the respondents (45%) had already heard of Internet therapy (awareness of Internet therapies). Almost all participants (96%) used the Internet daily. About one-third (34%) of the sample used videoconferencing regularly. The four experimental groups did not differ significantly in any of the included control variables. Comparisons of demographic differences between completers and non-completers are provided in Table 1.

3.2. Preliminary analyses

Of the 439 included data sets, 91 records contained missing values (one or two missing items per data set on overage). Altogether, 0.5% of the values were missing in the entire survey. Analyses were based on the assumption that the values were missing completely at random (MCAR) according to Little's MCAR test ($\chi^2(1875, N = 439) = 1958.06$, $p = .09$). Univariate outliers using box-whisker diagrams (values that are less than or equal to 1.5 times the interquartile distance) applied to a total of six cases related to the ETAM. Extreme outliers (values outside the three-time interquartile distance) were not found. Multivariate outliers (analyzed via Mahalanobis distance, indicated by significant chi-square test; $p < .001$) pertained to four cases. Taken together, there were no indications of incorrect or implausible data.

3.3. Exploratory factor analyses of the ETAM

Both the KMO coefficient (0.92) and the Bartlett test ($\chi^2(105, N = 439) = 2982.93$, $p < .001$) indicated that the data were suitable for EFA. The Kaiser-Guttmann criterion with eigenvalues > 1.0 suggested two factors. Characteristic changes of the scree plot confirmed a two-factorial structure. Appendix A shows the means (M) and standard deviations (SD) of the used 15 ETAM items as well as the rotated factor loading matrix. Intercorrelations of items ($r = 0.16$ to $r = 0.72$) supported the decision for an oblique rotation procedure (see Appendix B).

Given that item 9 showed low loadings on the two factors as well as the lowest communality and that item 12 could not be clearly allocated to one factor, both items were excluded from further analyses. The remaining 13 items were assigned to two factors. The first factor (item 7, 5, 10, 8, 1, 15, 3) describes the advantages of Internet therapies and can therefore be interpreted as Perceived Usefulness (helpfulness/benefit). The second factor (items 4, 2, 6, 11, 14, 13) represents the extent to which Internet therapies are perceived comparable to conventional psychotherapy, for example in terms of efficacy, and was therefore called Relative Advantage (comparability/alternative). The factors had a value of 5.75 (Perceived Usefulness) and 1.52 (Relative Advantage) and explained a total of 56% of variance of the EFA model (Perceived Usefulness: 44%; Relative Advantage: 12%). Both factors correlated strongly ($r = 0.56$).

Global attitudes toward Internet therapy (measured by the total mean value of the ETAM) were found in the neutral range ($M = 2.08$, $SD = 0.65$). While the factor Perceived Usefulness was evaluated positively ($M = 2.67$, $SD = 0.67$), the assessment of Relative Advantage was rather negative ($M = 1.40$, $SD = 0.78$).

3.4. Differences between information type group in attitudes toward internet therapies

The one-way ANOVA revealed significant group difference between the information texts groups in attitudes toward e-mental health services/Internet therapies compared to the control group (ETAM overall value; $F(3,455) = 6.63$, $p < .001$, $\eta_p^2 = 0.04$, 95% CI for η_p^2 [0.01, 0.08]). This indicates a small effect. 4% of the variance of the total mean value of the ETAM could be explained by the differences in the texts. Post-hoc analyses using the Tukey-Kramer test showed that in comparison to the control group, respondents who had read the neutral information text or the expert evaluation showed more positive attitudes (Bonferroni Adjustment = 0.0167). The attitudes of respondents who had read user evaluations did not differ significantly from the other three conditions (see Fig. 2).

The MANOVA further showed significant group differences between the information texts groups in the assessments of the ETAM factors Perceived Usefulness and Relative Advantage (with small effect sizes). 4% of the variance of Perceived Usefulness and 2% of Relative Advantage could be explained by this model. The following differences were identified between the information groups: Participants who had read the neutral text or the expert evaluation reported higher values in terms of Perceived Usefulness compared to the CG. The expert evaluation group also estimated the Perceived Usefulness significantly higher than the user evaluation group. A significantly higher evaluation of the Relative Advantage related to Internet therapies, compared to the CG, was only found in the expert evaluation group. All other paired comparisons of Relative Advantage values were not significant. Descriptive data on the likelihood to use different mental health services can be obtained from Appendix C.

3.5. Differences in intentions to use e-mental health services between the information groups

Concerning the second research question, the mean likelihood of a future usage of unguided Internet therapies was the lowest, whereas Internet therapies with therapist-guidance had the highest values in the four conditions (see Fig. 3).

The MANOVA regarding the likelihood to use four different mental health services showed a significant main effect of the three information texts (Roy's greatest characteristic root = 0.03, $F(4,425) = 3.03$, $p = .02$, $\eta_p^2 = .03$, 95% CI for η_p^2 [0.001, 0.057]). Moreover, there was a significant interaction effect between information texts and the likelihood to use unguided Internet therapies ($F(3,426) = 3.72$, $p = .01$, $\eta_p^2 = .03$, 95% CI for η_p^2 [0.001, 0.056]), with a small effect size. Post-hoc analyses using the Tukey-Kramer test showed that individuals who received only the neutral text indicated higher probability to use unguided Internet therapies than the CG. In contrast, the difference between the CG and the groups of user evaluation and expert

Table 1
Demographic variables and differences between completers (N = 439) and non-completers (N = 88).

	Completers (N = 439)	Non-completers (N = 88)	Comment
Age			
M	33.10	29.32	completers are significantly older than non-completers
SD	10.63	8.33	($t(63,42) = -2.87$, $p < .01$)
Min; Max	18; 75	17; 53	
Gender			
♀	72.2%	81.3%	descriptively, more female completers
♂	27.1%	14.6%	
Missing	0.7%	4.3%	
Marital status			
Single	43.1%	47.9%	descriptively, more completers are married or living in partnership; more non-completers are divorced
Married/partnership	53.5%	37.5%	
Divorced/separated	1.8%	8.3%	
Widowed	0.7%	2.1%	
Missing	0.9%	4.2%	
Educational level			
No graduation	0.2%	2.1%	descriptively, more completers had a higher tertiary education (Master degree)
Main/board school	0.5%	0.0%	
Middle school	3.6%	8.3%	
Vocational college	4.3%	2.1%	
Grammar school	34.6%	27.1%	
College (Bachelor)	24.4%	45.8%	
College (Master/Diploma)	28.2%	6.3%	
Doctorate	3.4%	2.1%	
Other	0.8%	6.2%	
Employment status			
Pupil	0.0%	2.1%	descriptively, no relevant difference between completers and non-completers concerning employment status
Trainee	0.7%	2.1%	
Student	50.3%	52.1%	
(Self-)employment	40.5%	37.5%	
Housewife/parental leave	4.1%	0.0%	
Work-seeker/unemployed	1.6%	2.1%	
Retiree	0.9%	0.0%	
Currently unemployable	0.5%	0.0%	
Other	1.1%	2.1%	
Missing	0.3%	2.0%	
Healthcare employment			
No	85.2%	83.3%	descriptively, no relevant difference between completers and non-completers concerning employment in healthcare
Yes (therapeutic)	6.6%	8.3%	
Yes (non-therapeutic)	8.2%	6.3%	
Missing	0.0%	2.1%	
Experience with online counselling			
Yes	4.3%	3.1%	descriptively, no relevant difference between completers and non-completers concerning experience with online counselling
No	91.6%	81.3%	
Not sure	3.0%	6.3%	
Missing	1.1%	9.3%	
Experience with psychotherapy			
No (no need)	63.6%	56.3%	descriptively, no relevant difference between completers and non-completers concerning experience with psychotherapy
No (searching)	2.5%	3.1%	
Yes (present therapy)	5.9%	6.3%	
Yes (past therapy)	27.8%	31.3%	
Missing	0.2%	3.0%	
Awareness of Internet therapy			
Yes	44.9%	43.8%	descriptively, no relevant difference between completers and non-completers concerning the awareness of Internet therapy (e-awareness)
No	46.0%	37.5%	
Not sure	8.7%	12.5%	
Missing	0.4%	6.2%	

evaluation was not significant. Furthermore, differences between the information groups in the usage likelihood of online counselling ($F(3,426) = 2.47$, $p = .06$, $\eta_p^2 = 0.02$, 95% CI for η_p^2 [−1.91, 0.04]), telephone counselling ($F(3,426) = 0.94$, $p = .42$, $\eta_p^2 = 0.01$, 95% CI for η_p^2 [−1.92, 0.02]) and guided Internet therapy ($F(3,426) = 1.99$, $p = .12$, $\eta_p^2 = .01$, 95% CI for η_p^2 [−1.92, 0.02]) were not significant compared to the CG.

4. Discussion

The purpose of this pilot study was to explore associations between different types of text-based psychoeducational information in attitudes toward Internet therapies and in intentions to use e-mental health services in a German nonclinical online sample. Another goal was to determine which type of e-mental health service is preferred. Key findings, limitations and implications will be discussed.

4.1. Summary of evidence and comparisons with previous work

In summary, analyses of variance showed a significant positive association between the provision of neutral text alone and the neutral text that was supplemented by the expert evaluation in attitudes toward Internet therapies compared to the control condition. In contrast, the attitudes of the user evaluation group were not significantly different from the attitudes of the control group. Furthermore, the expert evaluation was found to have the strongest positive association with

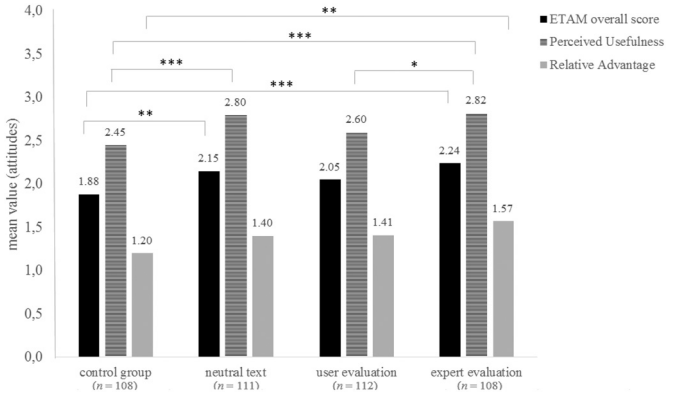

Fig. 2. Differences between information groups in attitudes toward Internet therapies. $N = 439$ participants; **: $p < .01$; ***: $p < .001$. E-therapy attitudes measure (ETAM), mean scores of the 13-item version with a five-point rating scale ranging from 0 ("strongly disagree") to 4 ("strongly agree"). *SD* for the four groups: ETAM overall score with *SD* ranging from 0.60 to 0.70, factor Perceived Usefulness with *SD* ranging from 0.61 to 0.71, factor Relative Advantage with *SD* ranging from 0.71 to 0.85.

attitudes toward e-mental health treatments in terms of Internet therapies. Finally, a significant higher likelihood of future use e-mental health services was shown only for unguided Internet therapy in the group that received the (neutral) information texts compared to the CG.

Overall, descriptive analyses revealed neutral attitudes toward e-mental health services in terms of Internet therapies. While the factor Perceived Usefulness was evaluated positively, the factor Relative Advantage was valued more negatively. This ambivalence was found in all four study groups. In addition, participants reported higher intentions to use face-to-face mental health services than online counselling and Internet therapies in the case of emotional problems. However, there was also an indication for ambivalent attitudes toward Internet therapies. The finding that participants in all groups preferred face-to-face therapy to Internet therapy is consistent with previous research (Apolinário-Hagen et al., 2017a, 2017b). The theory of planned behavior (TPB; Ajzen and Madden, 1986) provides a possible explanation for the low willingness to using e-mental health services and the rather negative evaluation compared to face-to-face therapy (Relative Advantage) despite perceived benefits (Perceived Usefulness). Uncertainties regarding the helpfulness of e-mental health treatment services caused by lacking knowledge could result in a low willingness for future use. In the present study, 45% of the respondents indicated that they had already heard of Internet therapies (e-awareness). This proportion is higher than in previous studies from Germany that used the same item on e-awareness (Apolinário-Hagen et al., 2017a, 2017b; DIW/SOEP-IS Innovation modules, 2016).

Data suggested that participants who used videoconferencing or had experience with e-mental health services evaluated the factor Relative Advantage more positively. This is in line with the findings by Ross et al. (2009) that the communication medium becomes irrelevant with increasing experience with a specific e-mental health service. Since in the present study, only a small proportion of participants reported experience with online counselling or videoconferences, the low level of familiarity with these media might have contributed to low perceived behavioral control and potentially impacted utilization probability negatively. This assumption is supported by Chan et al. (2016) who identified possible difficulties in online communication as a reason for the preference for face-to-face therapy. Further, this is also in accordance with research by Eichenberg et al. (2013) comparing the willingness to use e-mental health services in the general public and among the subgroup of regular Internet users: While only 26% percent of a representative sample from the German population were willing to use Internet-based treatments, 44% of Internet users agreed to be willing to use these types of treatments. In an Australian online study Klein and Cook (2010), it was concluded that most respondents (77%) preferred face-to-face over e-mental health services. However, the vast majority was also willing to use e-mental health services, but more than half reported to have insufficient information about these forms of therapy (Klein and Cook, 2010). This preference for face-to-face over e-mental health services (with 90%) was also confirmed in another study with Arab Australians (Kayrouz et al., 2015).

As assumed, the results further indicated a positive association between the provision of informational texts and attitudes toward Internet therapies compared to the control condition in terms of Perceived Usefulness and Relative Advantage. In line with this study, an Australian RCT (Casey et al., 2013) revealed that text-based information about e-mental health services can improve attitudes, at least in terms of a significantly higher willingness to use. The most positive scores in attitudes at the post-treatment assessment in the present RCT were found in the group that received the text with an expert evaluation, followed by the group with the neutral information alone. This appears plausible as academic experts are a highly credible source for the assessment of e-mental health services (Ritterband et al., 2009). The least important difference to the control condition in attitudes between the information groups was found in the group that received neutral information with user testimonials. Strikingly, the mean score for the group of user evaluation was lower than the scores found in the group that received the neutral text alone. This contradicts the social influence proposed in the UTAUT (Venkatesh et al., 2003). Possibly, the brief text with the user evaluations was not sufficiently credible or trustworthy. Participants may have associated the fictional provider "MH Online" with a commercial provider and paid fake user testimonials on commercial online platforms. In accordance with the Social Learning Theory (Bandura, 1977), respondents may not have perceived themselves similar enough to the model presented in the user evaluation condition (e.g. in terms of age or health status), which could result in a low involvement of the participants. In an Australian pilot RCT (Healey et al., 2017) that aimed to improve visit-to-registration rates for MoodGYM using narratives, program testimonials were also not

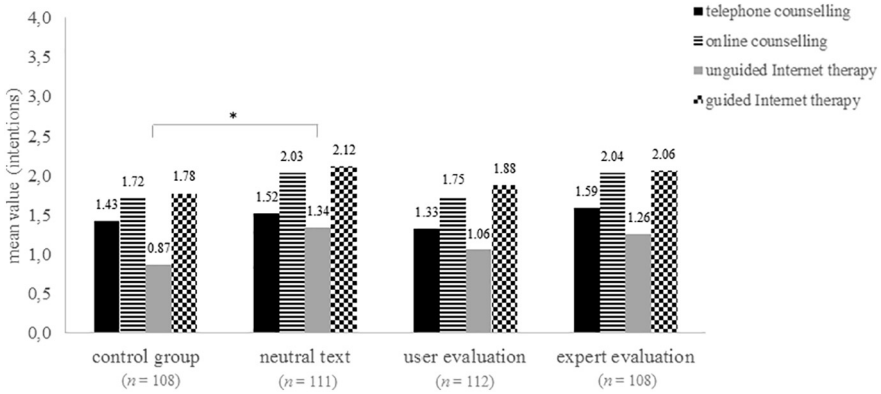

Fig. 3. Differences between information groups in intentions to use e-mental health services.
$N = 439$ participants; *: $p < .05$. Intentions to use (likelihood of future use), means of a five-point rating scale ranging from 0 ("very unlikely") to 4 ("very likely"). *SD* for the four groups: telephone counselling with *SD* ranging from 1.13 to 1.23, online counselling with *SD* ranging from 1.08 to 1.21, unguided Internet therapy with *SD* ranging from 1.06 to 1.24 and guided Internet therapy with *SD* ranging from 1.08 to 1.23.

effective. In contrast to other areas of health communication (see Keller et al., 2006), the investigation of the role of narratives and heuristic decision-making in intentions to use and actual utilization of e-mental health services is at an early stage and needs further research.

With regard to intentions to use different e-mental health services, a significant effect of the information texts was shown for unguided Internet therapy only. A potential reason is that especially unguided Internet therapies were previously perceived to be ineffective so that pure information about Internet therapies could improve attitudes about Internet therapies in general. Another potential reason is that individuals want to handle their problems on their own (Andrade et al., 2014); unguided Internet treatments provide this opportunity.

4.2. Limitations

Several limitations must be taken into account. Concerning the composition of the sample, the ratio of females (72%) and the education level were remarkably higher than in the German general population (Federal Statistical Office [Statistisches Bundesamt], 2013). This restricts the generalizability of the results, as it is assumed that people with low IT knowledge and a low level of education tend to less accept Internet therapies (Waller and Gilbody, 2009). Moreover, participants were mostly recruited via social media. Both factors could have resulted in selection bias (Choi et al., 2017). Since patients' preferences depend on the degree of awareness of services (Caspar et al., 2013), prior knowledge of Internet therapies could have influenced their acceptance. Future studies should assess participants' prior knowledge about e-mental health services more detailed. This might indicate whether changes in attitudes are due to novel meaningful information or to repeated exposure. Another drawback is that the omission of a pre-intervention assessment of attitudes significantly limits the strength and validity of conclusions on the effectiveness of information material. Furthermore, it should be noted that the ETAM has not been fully validated. Since at present no established questionnaire for measuring attitudes toward e-mental health services in the general population is available (Apolinário-Hagen et al., 2017a, 2017b), previous studies used self-developed instruments as well (e.g. Klein and Cook, 2010). This restricts the comparability of results. Moreover, some items of the ETAM contained comparisons with face-to-face psychotherapy. This could have bolstered the interpretation of face-to-face therapy as a benchmark, influencing the evaluation of Internet therapy negatively (Musiat et al., 2014). Finally, the item used to assess attitudes toward psychotherapy in general (Albani et al., 2013) seems to be more referring to the assessment of attitudes toward seeking help for mental health problems more generally.

4.3. Implications for research and practice

For a successful dissemination of e-mental health services, positive attitudes are an important prerequisite. It is assumed that patient preferences also depend on the current level of awareness of services and positive publicity (Berger, 2013). The lack of information and familiarity can be a reason for negative attitudes toward e-mental health services and their poor uptake (Musiat et al., 2014). In this study, rather unspecific information about e-mental-health services was associated with more positive attitudes compared to the control condition. In future studies, it might be interesting to analyze the extent to which tailored information with regard to specific mental health issues and target groups will lead to positive changes in attitudes and the willingness to future use e-mental health services. For this purpose, user evaluations varying in content and format (visual or verbal) should be assessed to determine acceptance-facilitating features of information material regarding e-mental health services with a more robust study design, including a pre-assessment of attitudes. For instance, different case vignettes for user testimonials (e.g. involving differences in sociodemographics, health status, or the background of the health service provider, such as non-profit vs. commercial) should be tested in future studies to identify the effective components of information texts for specific populations of recipients. Furthermore, quality labels, such as the Health on the Net (HON) label (see Boyer et al., 2011), could be used for information materials to increase their effect.

Additionally, in future studies, it might be interesting to consider the influence of social categorization processes or stereotypes associated with mental illnesses. In this study, no data on current psychological distress and mental disorders were collected. However, studies have shown that attitudes toward psychosocial therapy services can differ between mentally ill and healthy subjects (Waller and Gilbody, 2009). Future research should control for potential effects of current mental health issues on attitudes toward e-mental health services (Casey et al., 2013).

4.4. Conclusions

Overall, the results of this pilot study suggested poor awareness of e-mental health services and ambivalent attitudes toward Internet therapies in terms of Perceived Usefulness and Relative Advantage. Furthermore, the preliminary findings of this RCT also indicated a positive association between the provision of psychoeducational text-based information about e-mental health services and attitudes as well as higher usage intentions regarding unguided Internet therapies compared to the control group. Due to several limitations, further research is required to confirm these findings with a more robust research design and to determine the impact of psychoeducational information on the promotion and uptake of e-mental health services.

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Disclosure statement

The authors declare that there are no conflicts of interest.

Appendix A

Pattern matrix; factor loadings, mean scores, standard deviations, communalities and sample size of the e-therapy attitudes measure (ETAM).

Perceived usefulness		Relative advantage	M	SD	h^2	N
7. Through the dissemination of Internet therapies, persons will earlier get professional help.	**0.93**	0.20	2.59	0.92	0.68	438
5. Internet-based therapies will reach more individuals with mental health problems.	**0.89**	0.14	2.64	0.93	0.67	438
10. Internet-based therapies will reach more patients and help them.	**0.79**	+ + +	2.55	0.96	0.67	434

8. The anonymity in Internet therapies decreases the threshold to speak openly and honestly about important issues.	**0.68**	− 0.11	2.48	1.07	0.39	438
1. Internet-based therapies are modern and in line with our modern times.	**0.52**	0.15	2.98	0.84	0.39	437
15. Health insurance companies should cover the costs for Internet-based therapies.	**0.51**	0.22	2.77	1.03	0.45	437
3. Internet-based therapy is better compatible with work and private life than conventional face-to-face therapy.	**0.45**	0.12	2.66	0.89	0.27	437
12. In case of mental health problems, I would attend an Internet-based therapy.	0.45	0.42	1.69	1.27	0.60	439
9. I'm not particularly worried about data security in Internet therapies.	0.35	0.21	1.50	1.31	0.25	439
4. It makes no difference to me whether psychotherapy is conducted through the Internet or in a psychotherapy practice in a clinic.	− 0.19	**0.93**	0.95	0.96	0.69	438
2. Internet-based therapies will replace conventional face-to-face psychotherapy in the future.	− 0.20	**0.81**	1.14	0.95	0.50	435
6. Trust in a therapist can be just as easily built on the Internet as in conventional face-to-face psychotherapy	+ + +	**0.74**	1.57	1.11	0.64	439
11. I would prefer an Internet-based therapy to a conventional face-to-face psychotherapy.	+ + +	**0.72**	1.01	1.05	0.56	437
14. Internet-based therapy programs are as effective as conventional face-to-face psychotherapies.	0.12	**0.71**	1.71	0.93	0.61	437
13. Internet-based therapies are an appropriate alternative to conventional face-to-face psychotherapy.	0.33	**0.59**	1.99	1.05	0.68	439

Notes. Extraction method: Main component analysis. Rotation method: promax rotation (Kappa = 4). Factor loadings smaller than .1 were suppressed (+ + +). Factor loadings greater than .50 are marked bold. Item rotation converged in 3 iterations. Both item 9 and 12 were not included in the calculation of the mean overall score and into the two extracted factors of the ETAM (due to similar loadings on both factors).

Appendix B

Correlation matrix of the ETAM (N = 439).

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13	Item 14
Item 2	0.25													
Item 3	0.33	0.28												
Item 4	0.28	0.55	0.31											
Item 5	0.40	0.23	0.38	0.28										
Item 15	0.41	0.22	0.31	0.31	0.41									
Item 14	0.39	0.39	0.26	0.53	0.36	0.49								
Item 6	0.39	0.44	0.23	0.52	0.36	0.42	0.64							
Item 13	0.44	0.41	0.35	0.51	0.44	0.56	0.67	0.65						
Item 12	0.41	0.32	0.31	0.43	0.47	0.47	0.48	0.54	0.61					
Item 11	0.29	0.40	0.25	0.58	0.34	0.32	0.48	0.53	0.50	0.62				
Item 10	0.46	0.28	0.35	0.33	0.72	0.48	0.46	0.46	0.57	0.55	0.37			
Item 9	0.27	0.20	0.22	0.31	0.26	0.30	0.24	0.28	0.36	0.43	0.31	0.28		
Item 8	0.24	0.18	0.24	0.19	0.40	0.23	0.26	0.29	0.32	0.38	0.34	0.36	0.27	
Item 7	0.39	0.19	0.32	0.21	0.60	0.43	0.34	0.36	0.45	0.47	0.31	0.56	0.34	0.51

Note. Items 9 and 12 were not integrated in the total score and the factors of the ETAM.

Appendix C

Descriptive analyses for intentions to use mental health services (N = 439).

Control group			Neutral text		User evaluation		Expert evaluation	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self-help books	2.46	1.26	2.41	1.24	2.43	1.43	2.44	1.36
E-mental health websites	2.78	1.11	3.05	0.88	2.96	1.04	3.15	1.02
Counselling (face-to-face)	2.99	1.04	2.80	1.12	2.83	1.03	2.74	1.21
Online counselling	1.71	1.19	2.02	1.17	1.75	1.08	2.04	1.22
Telephone counselling	1.42	1.16	1.52	1.16	1.34	1.14	1.57	1.23
Psychotherapy (face-to-face)	2.99	1.02	2.86	1.07	2.87	1.07	2.84	1.17
Unguided Internet therapy	0.84	1.07	1.35	1.17	1.06	1.07	1.24	1.24
Guided Internet therapy	1.76	1.14	2.10	1.14	1.88	1.08	2.06	1.22
Consultation with a doctor	2.62	1.29	2.55	1.17	2.71	1.10	2.59	1.23
Prescribed medication	1.85	1.34	1.76	1.26	1.95	1.27	1.93	1.28

Note. N = 439, control group: n = 108, neutral text: n = 111, user evaluation: n = 112, expert evaluation: n = 108. Measured using the item, How likely is it that you would use the following services in case of mental health problems? "on a 5-step rating scale ranging from 0 ("*very unlikely*) to 4 ("*very likely*"; see Klein and Cook, 2010).

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