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ORIGINAL ARTICLE

# Attitudes Towards Internet Interventions Among Psychotherapists and Individuals with Mild to Moderate Depression Symptoms

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**Abstract** Internet interventions may help bridging gaps in the treatment of depression but dissemination is slow in most countries. Attitudes towards these novel treatments options among health care professionals and potential users may be crucial for a successful implementation. We recruited 1004 adults with mild to moderate depression symptoms within a randomized-controlled trial (RCT) on the efficacy of an Internet intervention (EVIDENT trial), and 428 licensed psychotherapists. We used the *Attitudes towards Psychological Online Interventions Questionnaire* (APOI) and confirmed psychometric validity of an adapted version for health care professionals, in order to test if psychotherapists hold more negative attitudes towards such interventions compared to individuals with depression symptoms, and to explore variables that predict these attitudes. Individuals with depression symptoms reported more positive attitudes towards Internet interventions than psychotherapists (large group difference; $\eta_p^2 = 0.384$). Recruitment in clinical settings was associated with more negative attitudes compared to recruitment via the media. Among therapists, endorsing a psychodynamic rather than another theoretical orientation was associated with more pronounced negative attitudes. Results elucidate possible reasons for the slow dissemination of Internet interventions and suggest pathways for appropriate implementation into healthcare services.

**Keywords** Internet interventions · iCBT · Depression · Attitudes · Psychotherapists

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## Introduction

Depression is among the most common forms of human psychological suffering, it is one of the most prevalent mental disorders, and it is a leading cause of lost economic output worldwide (Chisholm et al. 2016; Murray and Lopez 1997; Wittchen et al. 2011). Psychotherapy is effective in the treatment of depression (Barth et al. 2013), but only about half of those afflicted receive adequate treatment (Kohn et al. 2004; Morris et al. 2012). Reasons for this treatment gap include failure to detect depression in primary care (Sielk et al. 2009), lack of outpatient psychotherapists (Siponen and Välimäki 2003), and therapists' inadequate adherence to evidence-based treatments, such as cognitive behavioural therapy (CBT) (Emmelkamp et al. 2014). Due to the lack of outpatient psychotherapists, patients with mild to moderate depression symptoms often receive antidepressant medication (Holzinger et al. 2011).

This contrasts with treatment guideline recommendations (Fournier et al. 2010) as well as with depressed patients' treatment preferences, as they tend to prefer psychotherapy (Houle et al. 2013). Furthermore, people with depression are sometimes reluctant to seek professional help (Cuijpers 2011), for example, because of fear of stigmatization, negative attitudes towards psychotherapy (Moritz et al. 2012), and structural treatment barriers, such as financial or time constraints (Mohr et al. 2010).

Internet interventions, used either as stand-alone or as guided programs that are typically based on cognitive behavioural methods (internet-based cognitive behavioural therapy; iCBT), are often regarded as effective and pragmatic novel treatment options, which can help reduce depression symptoms on an individual level and, on a societal level, help narrow the depression treatment gap (Schröder et al. 2016). Such interventions could potentially be disseminated to vast numbers of people (Andersson and Titov 2014; Johansson and Andersson 2012) by circumventing some of the barriers inherent in traditional treatment, such as fear of stigmatization (Mohr et al. 2010; Moritz et al. 2012). Internet interventions further promise to improve current treatments, particularly if they are implemented adjunctively to routine care (Andrews and Williams 2014). Notwithstanding that effectiveness has been demonstrated repeatedly (Gerhard Andersson and Cuijpers 2009; Johansson and Andersson 2012; Richards and Richardson 2012), implementation efforts proceed slowly and sometimes reluctantly in many countries (Ebert et al. 2015; Vis et al. 2015), despite notable initiatives in Australia (Titov et al. 2015), the Netherlands (Warmerdam et al. 2010), the United Kingdom (Marks and Cavanagh 2009), and Sweden (Hedman et al. 2014). Germany has a universal multi-payer health care system with two main types of health insurance (*statutory health insurance* and *private health insurance*). In 2014, health insurance companies provided complementary Internet interventions for the first time. Beyond that, implementation in Germany is yet mostly restricted to individual purchases or to offerings in the context of clinical trials. Thus, barriers to implementation and dissemination need to be examined (Watts and Andrews 2014), and apart from effectiveness and cost effectiveness, the acceptability of Internet interventions for different stakeholders ought to be investigated (Ebert et al. 2015; Gun et al. 2011; Musiat et al. 2014).

Attitudes towards Internet interventions may determine to some extent whether such interventions can be implemented in health care systems. However, structural aspects of health care systems may also play a key role. For example, certain computerized interventions have been included in national depression treatment guidelines for many years, for example in the *National Institute of Clinical Excellence* (NICE) in the United Kingdom (Clark 2011). In some countries, Internet interventions are also routinely offered by specialized university-affiliated clinics, units, or institutes, which often receive government funding (e.g., see the "Karolinska Institute" in Stockholm, the "Virtual Clinic" and the "Black Dog Institute" in Australia or the "Trimbos Institute" in the Netherlands). The implementation of Internet interventions is clearly facilitated by such structural and procedural supports, which is reflected by the fact that much of the research in this area is generated by a small number of research groups in the respective countries (see Arnberg et al. 2014). Positive attitudes towards Internet interventions may be a necessary but insufficient condition for wider dissemination, because favourable health policies and stable funding solutions are also required. Allocating research efforts to crucial dissemination factors may provide stakeholders and decision makers with knowledge about which strategies promote effective implementation (Drozd et al. 2016), where attitudes in the population may be a key factor.

Attitudes towards novel technological developments appear to be strongly polarized in some countries, with fervent supporters but also vocal opponents (Caspar et al. 2013), but few studies have actually systematically examined attitudes towards Internet interventions among different stakeholder groups. Some studies have investigated the acceptance of computer-based cognitive behavioural interventions (cCBT), rather than specifically Internet-based interventions. In a British survey, for example, 329 psychotherapists rated cCBT-programs as less effective than traditional psychotherapy but as more effective than bibliotherapy (Whitfield and Williams 2004). A systematic review suggested that individuals with a mental disorder as well as general practitioners seem to hold more positive attitudes towards cCBT than psychotherapists (Waller and Gilbody 2009). According to these authors, some therapists are concerned that cCBT-programs are developed with the intention of replacing them rather than supporting their work. Furthermore, psychotherapists' lack of knowledge concerning cCBT correlated with their reduced acceptance of such programs (Waller and Gilbody 2009). A systematic review of data from 12 trials revealed positive attitudes towards cCBT-programs among individuals with depression (Kaltenthaler et al. 2008). However, the authors noted that acceptance of cCBT may be overestimated because in most studies only those users who completed the respective program are interviewed regarding their satisfaction.

A Norwegian study aimed to measure attitudes of psychotherapists towards the use of e-mail and SMS in therapist-patient interactions in the context of traditional psychotherapy (Wangberg et al. 2007). The results of 1024 participants in this survey indicated that a dynamic theoretical orientation was associated with fewer positive attitudes and more negative attitudes towards the use

of novel communication media in face-to-face-therapy. Generally, psychotherapists' attitudes towards integrating Internet-based treatment elements appear be quite varied, with some therapists favouring and others strongly opposing such approaches (Eichenberg and Kienzle 2011; Mora et al. 2008; Wangberg et al. 2007).

A survey among 1104 Australians (41% health care staff, 59% laypersons) regarding their attitudes towards Internet interventions found that participants regard this as more appropriate for individuals with mild to moderate depression and anxiety disorders than for those with higher degrees of severity. Further, acceptance did not differ significantly between healthcare staff and laypersons (Gun et al. 2011). Another study aimed to compare attitudes towards face-to-face therapy, bibliotherapy, Internet interventions and psychotherapeutic smartphone-apps by recruiting 490 healthy participants from different sources, who were asked to evaluate the respective interventions regarding twelve pre-defined aspects, including: efficacy, motivation/stimulation, professionalism, application without waiting time, temporal flexibility, receiving feedback, receiving individual support, spatial flexibility, application free of charge, desirability, adaptability to individual way of learning, and anonymity (Musiat et al. 2014). While face-to-face therapy was rated as being good across all dimensions, except for 'application without waiting time', 'temporal flexibility', and 'application free of charge', participants rated exactly these dimensions as being good in Internet interventions (Musiat et al. 2014).

In conclusion, the body of evidence regarding attitudes towards Internet interventions in potential users and healthcare professionals is still small, for several reasons: (a) studies collected data on positive aspects retrospectively (e.g. satisfaction with a certain program) instead of also assessing negative aspects; (b) studies addressed attitudes only using single items or (c) studies surveyed only healthy participants. The overall aim of the present study was to systematically examine attitudes towards Internet interventions in individuals with depression symptoms and in psychotherapists. For this purpose, we used and adapted a validated psychometric questionnaire, the *Attitudes towards Online Interventions Questionnaire* (APOI). Hypotheses of the current study were that (1) the factor validity of an APOI version adapted for healthcare professionals (APOI-HP) is sufficient for its application, (2) psychotherapists hold different attitudes towards Internet interventions than do study participants with depression symptoms, and (3) there are personal or clinical variables that predict attitudes towards Internet interventions among individuals with depression symptoms and psychotherapists.

## Method

### Study Design and Procedure

We conducted this study in the framework of a large multicentre randomized controlled trial (RCT), the EVIDENT trial (Klein et al. 2013, 2016), which examined the effects of the Internet intervention deprexis (Meyer et al. 2015, 2009) in adults with mild to moderate depression symptoms. In the EVIDENT trial, self-report assessments were performed via the online-survey program 'EFS survey' (http://www.unipark.com/en). Following the online-survey, diagnostic interviews were conducted via telephone by trained and certified diagnosticians with university degrees in psychology or medicine. For the study at hand, only the online data of the first assessment point were analysed. Furthermore, we collected data in a sample of German psychotherapists using the same online-survey program.

### Participants and Recruitment

A total of 1013 participants with mild to moderate depression symptoms were recruited via multiple settings, including in- and outpatient medical and psychological clinics, depression specific online-forums, health insurance companies, and the media (e.g., newspaper and radio) within the EVIDENT-trial (Klein et al. 2013). Inclusion criteria were an age between 18 and 65 years, sufficient command of the German language, willingness to participate in online- as well as telephone diagnostic assessments, mild to moderate depression symptoms, and electronic informed consent. Exclusion criteria were a lifetime diagnosis of bipolar disorder or schizophrenia and acute suicidality (as determined by a telephone diagnostic interview). Individuals with severe depression symptoms as well as suicide risk and psychosis were excluded from the underlying trial in order to guarantee safety and to rule out impaired learning due to possible cognitive dysfunction.

The German Psychotherapy Association (*Deutsche Psychotherapeuten Vereinigung*; DPtV) and the German Association for Behavioural Therapy (*Deutsche Gesellschaft für Verhaltenstherapie*; DGVT) used their mailing lists in order to invite members to the online-survey including the APOI version adapted for healthcare professionals (APOI-HP). Inclusion criterion was a practice license for psychotherapy.

### Measures

The *Patient Health Questionnaire-9* (PHQ-9; Kroenke et al. 2001) is a self-report measure for the assessment of depressive symptom severity. Items are presented with a four-point Likert-scale and the sum score ranges from 0 to 27 points. The psychometric properties of the PHQ-9 are

excellent in terms of high internal consistency, good test-retest reliability, criterion validity as well as favourable sensitivity and specificity (Kroenke et al. 2001). The measure was administered online in order to include individuals with mild to moderate depression symptoms as defined by a score between five and 14 points.

The *Attitudes towards Psychological Online Interventions Questionnaire* (APOI; Schröder et al. 2015) assesses respondents' acceptance of Internet interventions along four dimensions (Skepticism and Perception of Risks, Confidence in Effectiveness, Technologization Threat, and Anonymity Benefits) on a five-point Likert-scale (1 = *totally agree*, 2 = *rather agree*, 3 = *not sure*, 4 = *rather disagree*, 5 = *totally disagree*). A higher total score (scale range: 16–80) represents a more positive attitude. The scale was introduced online as follows: "The following statements deal with psychological online interventions (e.g. deprexis, GetOn, HelpID), which were developed to ameliorate emotional distress (e.g. depression or anxiety). Please state your personal appraisal or—if you are not familiar with such interventions from personal experience—please share your expectations with us. Please rate your attitudes towards psychological online interventions in general, that is, not only based on the intervention used in the present trial". The APOI shows a good internal consistency ($\alpha = 0.77$); content validity was achieved by combining qualitative with quantitative development methods (Schröder et al. 2015). In order to enable a valid assessment in the psychotherapist sample, we adapted the APOI for administration in healthcare professionals by rephrasing items correspondingly (see Table 1).

The *Mini International Neuropsychiatric Interview* (M.I.N.I.; Lecrubier et al. 1997) is a short structured diagnostic interview, developed for the assessment of psychiatric disorders. We confined the diagnostic administration via telephone to those modules that were

**Table 1** Dimensions and items of the *Attitudes towards Online Interventions Questionnaire* (APOI) and the *Attitudes towards Online Interventions in Healthcare Professionals* (APOI-HP)

| | APOI (patients) | APOI-HP (healthcare professionals) |
|---|---|---|
| | **Skepticism and Perception of Risks** | **Scepticism and Perception of Risks** |
| SCE1 | By using a POI, I do not expect long-term effectiveness | I do not expect long-term effectiveness from a POI |
| SCE2 | By using a POI, I do not receive professional support | Affected people do not receive professional support from a POI |
| SCE3 | It is difficult to implement the suggestions of a POI effectively in everyday life | For affected people, it is difficult to implement the suggestions of a POI effectively in everyday life |
| SCE4 | POIs could increase isolation and loneliness | POIs could increase isolation and loneliness |
| | **Confidence in Effectiveness** | **Confidence in Effectiveness** |
| CON1 | A POI can help me to recognize the issues that I have to challenge | A POI can help affected people to recognize the issues that they have to challenge |
| CON2 | I have the feeling that a POI can help me | I have the feeling that a POI can help affected people |
| CON3 | A POI can inspire me to better approach my problems | A POI can inspire affected people to better approach their problems |
| CON4 | I believe that the concept of POIs makes sense | I believe that the concept of POIs makes sense |
| | **Technologization Threat** | **Technologization Threat** |
| TET1 | In crisis situations, a therapist can help me better than a POI | In crisis situations, a therapist can help affected people better than a POI |
| TET2 | I learn skills to better manage my everyday life from a therapist rather than from a POI | Affected people learn skills to better manage their everyday life from a therapist rather than from a POI |
| TET3 | I am more likely to stay motivated with a therapist than when using a POI | Affected people are more likely to stay motivated with a therapist than when using a POI |
| TET4 | I do not understand therapeutic concepts as well with a POI as I do with a therapist | Affected people do not understand therapeutic concepts as well with a POI as they do with a therapist |
| | **Anonymity Benefits** | **Anonymity Benefits** |
| ABE1 | A POI is more confidential and discreet than visiting a therapist | A POI is more confidential and discreet than visiting a therapist |
| ABE2 | By using a POI, I can reveal my feelings more easily than with a therapist | By using a POI, affected people can reveal their feelings more easily than with a therapist |
| ABE3 | I would be more likely to tell my friends that I use a POI than that I visit a therapist | Affected people would be more likely to tell their friends that they use a POI than that they visit a therapist |
| ABE4 | By using a POI, I do not have to fear that someone will find out that I have psychological problems | By using a POI, affected people do not have to fear that someone will find out that they have psychological problems |

Hierarchical factor structure: four first-order factors loading on one second-order global factor

*POI* Psychological online intervention

relevant for testing exclusion criteria (schizophrenia, bipolar disorder, and suicidality). Acute suicidality was further assessed based on a structured assessment of current suicidal ideation and past suicide attempts.

### Statistical Analyses

Analyses were performed in SPSS 21 (IBM® 2012a) and SPSS Amos21.0 (IBM® 2012b). In order to evaluate the factor-structure of the APOI-HP in a confirmatory factor analysis (CFA), we examined descriptive statistics of the items to determine whether the assumptions for this method were met. The maximum likelihood (ML) estimation method was applied to analyse the covariance matrix of the items. We used different indices to evaluate the model fit: chi-squared ($\chi^2$), normed chi-squared ($\chi^2$/df), the 'standardized root mean squared residual' (SRMR), the 'root mean squared error of approximation' (RMSEA), and the 'comparative fit index' (CFI), which are commonly recommended (Hu and Bentler 1999). A robust estimator (Bollen-Stine bootstrap procedure) was used to account for possible violations of the assumption of multivariate normal distribution of observations. Latent variables were scaled by fixing the loading of one indicator to each latent variable. Finally, the APOI-HR was assessed for its internal consistency (Cronbachs α).

Group differences were tested by a multivariate analysis of variance (MANOVA), and attitude predictors were examined using analyses of variance (ANOVA) with additional contrast analyses (Helmert contrasts). The presence of assumptions for these models were verified. The assumption of multivariate normality was assumed to be given due to univariate normality and possible biases through violations of the assumption of homogeneity of covariance matrices were corrected via the adjustment of sample sizes, because in case of equal sample sizes, the measure *Hotelling Spur* ($HS_\Lambda$) is considered as robust (Hakstian et al. 1979). The adjustment of sample sizes was achieved by creating a partition variable with Bernoulli distribution and a $p$ value of 0.430 in the larger sample ($n = 1004$, individuals with depression symptoms), so that 435 cases were randomly drawn for conducting the MANOVA.

Hypotheses were tested two-tailed and with an α-level of 0.05. Effect sizes are reported as partial eta squared ($\eta_p^2 \approx 0.01$ small, $\eta_p^2 \approx 0.06$ medium, $\eta_p^2 \approx 0.14$ large effect). Due to the large sample size, and thus generally small $p$-values, we defined statistically significant results ($p$ value $\leq 0.05$) as meaningful if they showed an effect size of $\eta_p^2 \geq 0.01$.

## Results

### Sample Characteristics

We reached 2020 individuals with depression symptoms for eligibility assessment, of which 1016 participants were excluded during the online- and telephone-assessments (see Fig. 1). Further, we reached 495 psychotherapists for eligibility assessment, of which 67 were excluded (see Fig. 1).

Table 2 presents relevant sample characteristics. Groups differed on age. On average, the psychotherapists (range: 27–70 years) were 6 years older compared with individuals with depression symptoms (range: 18–65 years). There was no significant group difference in gender or frequency of Internet usage. Psychotherapists did not know much about Internet interventions and only very few depressed individuals used an Internet intervention prior to this study.

### Psychometric Properties of the APOI-HP

The four-dimensional factor structure of the APOI (Schröder et al. 2015) was replicated in the adapted version for healthcare professionals in the psychotherapist sample studied in this trial. The CFA showed an acceptable (normed $\chi^2 = 2.192$; CFI = 0.932) to good (SRMR = .0508; RMSEA = 0.053) model fit as well as good internal consistency (α = 0.83). It was therefore concluded that no interpretation problems arise when comparing APOI scores of individuals with depression with those reported by psychotherapists.

### Differences in Attitudes

The multivariate test of the MANOVA revealed a significant overall group difference with a large effect size (see Table 3). ANOVA also revealed significant differences between groups with large effect sizes in the subscales APOI-TET, APOI-SCE and APOI-CON, as well as a small to medium effect size in the subscale APOI-ABE (see Table 3). This indicates that, compared with the depression sample, psychotherapists experienced a stronger threat due to the Internet technology, experienced scepticism/expected risks to a higher degree, believed in effectiveness to a lower degree, and perceived benefits due to the possibility to use Internet interventions anonymously to a lower degree.

### Attitude Predictors in Individuals with Depression Symptoms

In the sample of individuals with depression symptoms, the variables 'gender', 'frequency of Internet usage', 'age' and 'severity of depression symptoms' (PHQ-9) were not associated with attitudes towards Internet interventions

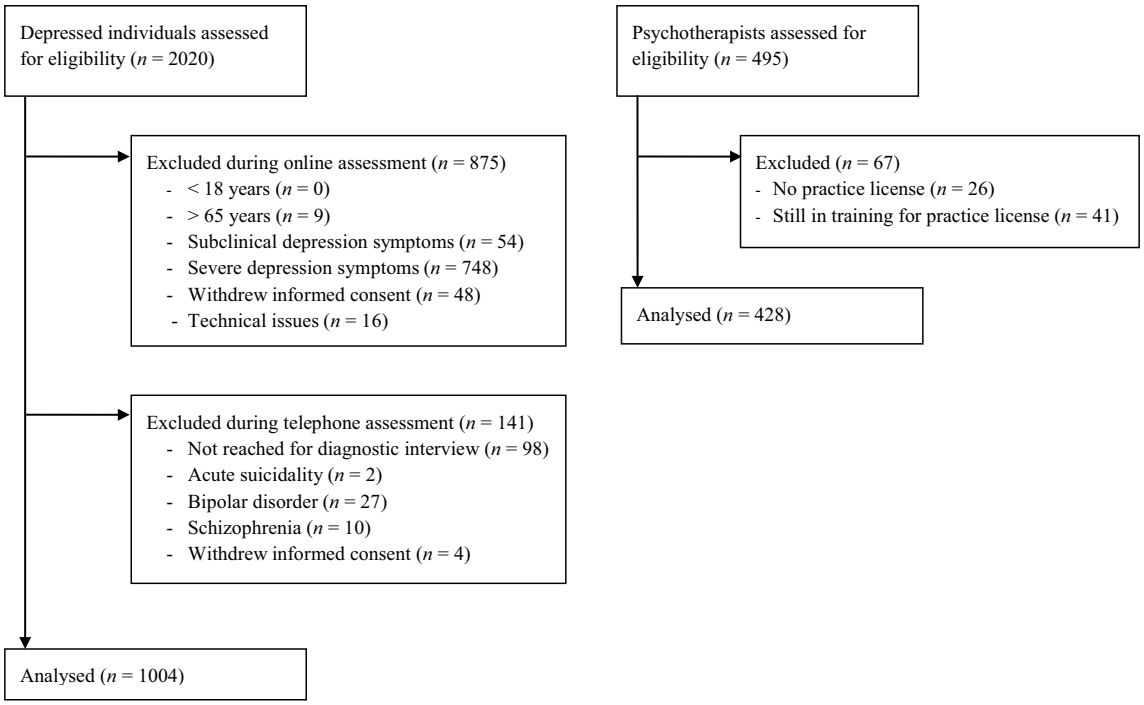


**Fig. 1** Enrollment of study participants

**Table 2** Demographic variables and group differences between individuals with depression symptoms and psychotherapists: means, standard deviations and frequencies

| Variables | Individuals with depression symptoms ($N=1004$) | Psychotherapists ($N=428$) | Statistics |
|---|---|---|---|
| Gender in % (female/male) | 68.6/31.4 | 68.7/31.3 | $\chi^2\,(1)=0.001$, $p=.980$ |
| Age in years (*M*/*SD*) | 42.9 (11.0) | 49.2 (9.60) | $t\,(916.274)=10.969$, $p<.001$ |
| Frequency of internet usage in % (at least daily/less frequent) | 86.6/13.4 | 88.8/11.2 | $\chi^2\,(1)=1.576$, $p=.209$ |
| Depression symptoms (PHQ-9; *M*/*SD*) | 10.28 (2.41) | – | – |
| Recruitment source in % (clinical setting / media / health insurance) | 11.3/60.8/28.0 | – | – |
| Prior usage of an Internet intervention in % (yes/no) | 2.7/97.3 | | |
| Knowledge about Internet interventions in % (none to minor/moderate to much) | – | 80.4/19.6 | – |
| Therapeutic alignment in % (CBT/PT/other) | – | 63.6/22.9/13.5 | – |

*PHQ-9* Patient-health-questionnaire-9, *CBT* cognitive behavioral therapy, *PT* psychodynamic therapy, *other* client-centered therapy, systemic therapy, cognitive remediation

(each $p<.001$ $\eta_p^2 \leq 0.007$). The variable recruitment source attained statistical significance, albeit with a small effect size, $F(2,1001)=7.659$; $p<.001$; $\eta_p^2=0.015$. Contrast analyses indicated that there was no significant difference in attitudes between individuals with depression symptoms recruited via health insurance companies (contrast 1) and individuals with depression recruited via the media (contrast 2; $p=.466$). However, there was a significant

**Table 3** Group differences in attitudes towards Internet interventions

| APOI(-HP) scale | Individuals with depression symptoms ($n=435$) | Psycho-therapists ($n=428$) | MANOVA & ANOVAs |
|---|---|---|---|
| Skepticism and perception of risks (APOI-SCE) | 9.45 (2.27) | 12.96 (3.00) | $F(1,861)=383.083$ $p<.001$; $\eta^2_p=0.308$ |
| Confidence in effectiveness (APOI-CON) | 16.71 (2.12) | 14.26 (2.98) | $F(1,861)=194.623$ $p<.001$; $\eta^2_p=0.184$ |
| Technologization threat (APOI-TET) | 11.77 (2.44) | 15.35 (2.50) | $F(1,861)=452.048$ $p<.001$; $\eta^2_p=0.344$ |
| Anonymity benefits (APOI-ABE) | 12.34 (3.11) | 11.18 (2.60) | $F(1,861)=35.199$ $p<.001$; $\eta^2_p=0.039$ |
| Total scale | 55.86 (6.89) | 45.14 (8.20) | $HS_\Lambda=0.624$ $F(4,858)=133.916$ $p<.001$; $\eta^2_p=0.384$ |

Means and standard deviations (in brackets) are retrieved from the estimated marginal means. The theoretical range of the total scale is 16–80 and the theoretical range of the subscales is 4–20

difference in attitudes between individuals recruited via non-clinical settings (pooled category of health insurance company & the media, that is contrast 1 & 2) and individuals with depression symptoms who were recruited via clinical settings (contrast 3; $p<.001$). Individuals recruited via clinical settings showed a 2.7 (4.2%) lower APOI score, indicating a more negative attitude towards Internet interventions, than individuals recruited via non-clinical settings. Additional analyses showed that the non-clinically recruited subgroup used psychotherapy less frequently in the past six months, $\chi^2(1)=11.779$, $p=.001$, and stated more frequently that they were not interested in using psychotherapy in the future, $\chi^2(1)=24.187$, $p<.001$.

Subscale analyses indicated that the recruitment-source-related difference in attitudes towards Internet interventions in individuals with depression symptoms is explained primarily by the subscale APOI-ABE, $F(2,1001)=6.142$; $p=.002$; $\eta^2_p=0.012$, indicating that participants recruited via clinical context experienced anonymity benefits to a lesser degree than participants recruited via the media and health insurance companies. Further, age was significantly associated with the subscale APOI-SCE, with a small effect size, $F(2,1001)=12.264$; $p<.001$; $\eta^2_p=0.012$, and with the subscale APOI-TET, $F(2,1001)=46.701$; $p<.001$; $\eta^2_p=0.045$, with a small to moderate effect size, indicating that older age was associated with reduced 'Skepticism and Perception of Risk' as well as a lower 'Technologization Threat' (0.2 and 0.5 points less in the respective subscales in ten years age difference). Moreover, the variable 'gender' was significantly associated with the subscale APOI-SCE with a small effect size, $F(2,1001)=17.839$; $p<.001$; $\eta^2_p=0.018$, such that men experienced more skepticism than women (0.7 points more in APOI-TET). No significant effects emerged for the remaining variables on the APOI subscales ($\eta^2_p \leq 0.01$).

## Attitude Predictors in Psychotherapists

In psychotherapists, the variables 'gender', 'frequency of Internet usage', 'knowledge about Internet interventions', and 'age' did not impact attitudes towards Internet interventions (each $\eta^2_p \leq 0.009$). The variable 'therapeutic orientation' was marginally significant with a small effect size, $F(2,425)=2.939$; $p=.054$; $\eta^2_p=0.014$. Contrast analyses indicated that there was no significant difference between psychotherapists with CBT orientation (contrast 1) and psychotherapists with other orientations (contrast 2; $p=.616$). However, there was a significant difference in attitudes between psychotherapists with CBT and other orientations (pooled category of CBT & others, that is contrast 1 & 2) and psychotherapists with a psychodynamic orientation (contrast 3; $p=.017$), the latter scoring 2.4 points lower on the APOI-HP (2.4%), which indicates a more negative attitude towards Internet interventions.

Subscale analyses indicated that the therapeutic-orientation-related difference in attitudes towards Internet interventions in psychotherapists was explained primarily by the subscales APOI-SCE, $F(2,225)=3.494$; $p=.031$; $\eta^2_p=0.016$ and APOI-CON, $F(2,224)=3.337$; $p=.036$; $\eta^2_p=0.015$, indicating that cognitive-behavioral therapist perceived skepticism and risks to a lesser degree and had more confidence in the effectiveness of Internet interventions. Further, the variable 'age' was significantly associated with the subscale APOI-CON with a small effect size, $F(2,224)=5.677$; $p=.018$; $\eta^2_p=0.013$, indicating that older age was associated with reduced 'Confidence in Effectiveness' (0.4 points less in this subscale in ten years age difference). Beyond that, the variable 'gender' was significantly associated with the subscale APOI-ABE with a small effect size, $F(2,226)=5.482$; $p=.020$; $\eta^2_p=0.013$, such that men endorsed greater 'Anonymity Benefits' than women (0.6

points more in this subscale). There were no significant effects concerning the remaining variables on the APOI subscales ($\eta_p^2 \leq 0.01$).

## Discussion

The present study investigated attitudes towards Internet interventions in individuals with depression symptoms and psychotherapists. Results revealed (1) evidence supporting the factorial validity of the APOI version adapted for healthcare professionals (APOI-HP) (2) more negative attitudes towards Internet interventions among psychotherapists compared to study participants with depression symptoms, (3) more positive attitudes among individuals with depression recruited from non-clinical rather than clinical settings, and (4) more positive attitudes among CBT rather than psychodynamic psychotherapists. Furthermore, subscale analyses indicated that age and gender were associated with some of these attitude dimensions.

The result that psychotherapists report considerably more negative attitudes towards Internet interventions compared to study participants with depression symptoms is consistent with results of studies on computer-based (not specifically Internet-) interventions, as reviewed by Waller and Gilbody (2009) as well as results on the acceptance of serious games (Eichenberg et al. 2016). These authors as well as Caspar (2004) ascribed the low acceptance of technological innovation in mental healthcare to psychotherapists' concern that these new treatment methods are meant to replace their work. The results of our study are also in line with those of Whitfield and Williams (2004), suggesting that psychotherapists tend to regard computer-based interventions as less effective than face-to-face interventions. The discrepant attitudes towards Internet interventions in individuals with depression symptoms versus psychotherapists in the present study could be explained, in part, by a central feature of most Internet interventions, less fear of stigmatization due to anonymity (represented by APOI-ABE), which many psychotherapists appraise rather negatively (i.e., lack of personal contact) but depressed individuals tend to appraise rather positively. The results of this study also overlap with the results of a study putting enhanced emphasis on outcome orientation, i.e. computer-based psychometric feedback, where therapists hold more negative attitudes than patients (Lutz et al. 2015). Broad implementation of Internet interventions will require the support of relevant stakeholders, including psychotherapists. In order to improve dissemination, we therefore consider it necessary to deal with the causes and consequences of the negative attitudes towards Internet interventions we observed among some psychotherapists. This may be achieved by educating healthcare professionals about the effectiveness and potential benefits of Internet interventions for depression, and about the present results on attitude differences between psychotherapists and those affected. We assume that reducing the gap between research and practice is a crucial factor for enhanced dissemination of Internet interventions.

The result that individuals with depression symptoms who were recruited in clinical settings (e.g. general practitioners' practices and psychiatric clinics) held more negative attitudes towards Internet interventions than those who were recruited in non-clinical settings (e.g. health insurance companies, Internet forums and the media) might also be explained, in part, by the fact that non-clinical participants appreciate the autonomy benefits afforded by Internet interventions (represented by APOI-ABE). A reason for this finding might be that those recruited via clinical settings tend to value the personal attention and care they receive at their clinics, whereas those recruited via non-clinical settings tend to value other aspects more strongly, such as the easy availability of helpful information conveyed by Internet interventions. It would be desirable to use the APOI in other patient groups (e.g. anxiety disorders) in order to assess whether these individuals hold rather negative or positive attitudes towards Internet interventions compared to individuals with depression symptoms. The present results suggest that Internet interventions may be most suitable for individuals who do not desire the support of a therapeutic relationship and who are motivated to use these interventions autonomously. If these results will be replicated in further studies, it could be argued that Internet interventions should rather serve to bridge the treatment gap (e.g. when waiting for psychotherapy) than being used blended, for example within a psychotherapy.

The result that psychodynamic therapists hold more negative attitudes towards Internet interventions than psychotherapists with other orientations is in line with results of other studies on computer-based (not necessarily Internet-) interventions by Mora et al. (2008) as well as Wangberg et al. (2007) and extend findings from a survey reported by Eichenberg and Kienzle (2011) who found that some CBT therapists but no psychodynamic therapists offered counselling and self-help material over the Internet. Psychodynamic therapists expressed more scepticism and less confidence in the therapeutic effectiveness, compared to CBT therapists and other psychotherapists. This result might be explained by psychotherapeutic procedures and intended modes of action: whereas psychodynamic therapies focus processing unconscious conflicts and working through the transference relationship, CBT is based on cognitive and learning-theory principles, which rather approach didactic presentations and can probably be modelled more easily in Internet interventions (Klein and Berger 2013). The results of this study overlap with the results of the aforementioned

study on computer-based psychometric feedback, where psychodynamic therapists hold more negative attitudes than cognitive-behavioural therapists (Lutz et al. 2015). In spite of that, some psychodynamic Internet interventions are available (Johansson et al. 2012). By administering the APOI-HP to other healthcare providers, more could be learned about other group-specific attitudes, such as those held by general practitioners, psychiatrists, or counsellors of different background and theoretical orientations. It is important to deal with negative attitudes towards Internet interventions in particular groups of healthcare professionals, because all of them are going to get in touch with this topic sooner or later, as implementation and dissemination proceeds. That implies the importance of reducing the gap between research and practice, by informing especially psychodynamic therapists about the treatment gap in depression, the effectiveness and potential benefits of Internet interventions, as well as about the delineated results on attitude differences.

Subscale analyses of the APOI indicated that an older age is associated with lower scepticism and risk perception as well as lower technologization threat in depressed individuals and with reduced confidence in effectiveness in psychotherapists. An explanation for these results might be based on a generally elevated openness to experience in depressed individuals of a higher age (up to 65 years), taking part in a RCT on an Internet intervention. At the same time, reduced confidence in effectiveness of psychotherapists of a higher age (up to 70 years) might be due to the fact, that individuals of the age-group around 70 years are less familiar with the Internet in general. Further, the analyses indicated, that male gender is associated with higher scepticism in depressed individuals and an increased perception of anonymity benefits in psychotherapists. An explanation for these results might be based on a generally elevated scepticism towards psychotherapeutic interventions as well as a higher reluctance to seek professional help in depressed males. At the same time, the elevated perception of anonymity benefits of male psychotherapists might be due to the fact that they sense the aforementioned scepticism in their male patients.

The present study addressed a number of shortcomings of prior studies on attitudes towards Internet interventions. First, our target of investigation was specifically Internet interventions, excluding other delivery modes such as computer-based, e-mail or face-to-face therapy. Second, unlike most studies asking for retrospective assessments of satisfaction with a specific program, we assessed both positive and negative attitudes prior to the usage of an Internet intervention. Third, instead of using single items or ad hoc pre-defined categories, this was the first study using a previously validated psychometric questionnaire assessing different attitudinal dimensions relevant to the target group (i.e. the APOI). Fourth, unlike many previous studies, the attitudes towards Internet interventions were assessed in the primary target group (people with elevated depression symptoms instead of healthy individuals, as in some previous studies) and were compared directly with attitudes of licensed psychotherapists (instead of general medical staff, as in previous studies).

Several limitations should be considered when interpreting our results. First, the fact that individuals were self-selected may raise concern that our sample included particularly Internet-savvy psychotherapists and depressed individuals with keen interest in Internet interventions. Further, only individuals with mild to moderate depression symptoms were included. A possible sampling bias due to self-selection and range restriction could mean that our results may not generalize to all people with depressive disorders or to psychotherapists who are less able or motivated to engage in Internet-based interventions. However, the case can be made that a sample of Internet-savvy individuals with mild to moderate depression symptoms represents exactly the target group that is relevant to research on Internet interventions for depression. Therefore, while our results may not generalize to all individuals with depression or all psychotherapists, they may accurately represent attitudes of those subgroups for whom Internet interventions are most relevant. This conclusion is supported by Buchanan (2003), who noted demographic, cultural and symptom-based differences between online and offline populations. Another limitation constitutes of the fact that generalizability to other countries is questionable. For example, the observation that only 3% of participants were familiar with Internet interventions may be different in other countries. Also, in the German health care system, patients can receive at least 25 psychotherapy sessions that are paid for by the statutory health insurance. This contrasts with other countries where fewer sessions are offered or where psychotherapy has to be fully paid out of pocket. When structural treatment barriers like long waiting periods and challenging application procedures are overcome, availability of psychotherapy is comparatively easy in Germany, which appears likely to influence attitudes towards Internet interventions in the German population. Therefore, generalizability of the present results to other countries has to be examined. Beyond that, the question of practical significance can be raised when interpreting the difference in attitudes between depressed individuals recruited via clinical settings versus those recruited via non-clinical settings as well as the differences in attitudes between psychodynamic and behavioural therapists: Those differences were statistically significant but yielded only small effect sizes and may therefore lack practical relevance. At the same time, these results are of great heuristic value for future studies. As another limitation, the predictor variables we

identified in the present study should be replicated in future studies, in order to increase faith in the finding's robustness: At first glance, it may seem surprising that attitudes towards Internet interventions were not associated with the frequency of Internet use; however, this might be explained by a ceiling effect, because 86.6% of the depressed individuals and 88.8% of the psychotherapists used the Internet at least daily (see Table 2). Future studies should look at a more fine-grained variable tapping frequency of Internet usage in order to avoid ceiling effects. The result that age was not associated with attitudes towards Internet interventions may have emerged due to self-selection, where participants may have general interest in such novel treatment modes, which may be a confounding factor for the age variable. Therefore, we encourage a replication of the present explorative results in future studies outside the context of clinical trials (e.g. in routine settings).

## Conclusion

In summary, the results of the present study suggest that efforts should be intensified to inform psychotherapists (especially those with psychodynamic orientations) about the potential benefits associated with Internet interventions for individuals with depression (especially for those individuals who cannot or do not wish to engage with the traditional healthcare system). Given the burgeoning literature on Internet intervention's effectiveness but paucity of research on factors predicting their uptake and dissemination, we believe that this study contributes to closing this evidence gap. The field of Internet interventions will probably continue to evolve at a rapid rate, and dissemination efforts should be intensified to optimize patient outcomes. Such efforts could be encouraged by further examination of attitudes towards Internet interventions in relevant populations, including individuals with other mental disorders as well as healthcare professionals in various clinical settings. Understanding individuals' attitudes towards Internet interventions may help allocating resources accordingly. Further, professional associations could play an important role in educating the public about Internet interventions and, thereby, promote the formation of realistic attitudes.

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**Compliance with Ethical Standards**

**Conflict of Interest** Björn Meyer reports that he is employed at Gaia AG, the developer and owner of an Internet intervention (deprexis). Johanna Schröder, Thomas Berger, Wolfgang Lutz, Martin Hautzinger, Christina Späth, Christiane Eichenberg, Jan Philipp Klein, and Steffen Moritz declare that they have no conflict of interest related to this work.

**Ethical Approval** This article does not contain any studies with animals performed by any of the authors. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The trial was approved by the ethics committee of the German Psychological Association (*Deutsche Gesellschaft für Psychologie*; DGPs) and registered at clinicaltrials.gov (NCT01636752).

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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