Acceptance of the German e-mental health portal www.psychenet.de: an online survey

Lisa Tlach, Juliane Thiel, Martin Härter, Sarah Liebherz, Jörg Dirmaier

Background. Taking into account the high prevalence of mental disorders and the multiple barriers to the use of mental health services, new forms of fostering patient information, involvement, and self-management are needed to complement existing mental health services. The study aimed at investigating acceptance regarding design and content of the e-mental health portal www.psychenet.de. **Methods.** An online cross-sectional survey was conducted between May 2013 and May 2015 using a self-administered questionnaire including items on perceived ease of use, perceived usefulness, attitude towards using, and perceived trust. **Results.** The majority of the N=252 respondents suffered from mental disorders (n=139) or were relatives from persons with mental disorders (n=65). The portal was assessed as “good” or “very good” by 71% of the respondents. High levels of agreement (89-96%) were shown for statements on the perceived ease of use, the behavioral intention to use the portal, and the trustworthiness of the portal. Lower levels of agreement were shown for some statements on the perceived usefulness of the portals’ content. Lower educational levels were associated with lower agreement levels regarding comprehensibility (p=0.019) and readability (p=0.012). **Discussion.** This survey provides preliminary evidence that the e-mental health portal www.psychenet.de appears to be a usable, useful and trustworthy information resource. The behavioral usefulness of the portals’ content might be improved by integrating more activating patient decision aids. Targeting the content to the needs of users with lower educational levels might further enhance the portals’ acceptance.

Acceptance of the German e-mental health portal www.psychenet.de: an online survey

Lisa Tlach[1], Juliane Thiel[1], Martin Härter[1], Sarah Liebherz[1*], Jörg Dirmaier[1*#]
[1] Department of Medical Psychology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany
* These authors contributed equally.
# Corresponding author

l.tlach@uke.de
j.thiel@uke.de
m.haerter@uke.de
s.liebherz@uke.de
dirmaier@uke.de

Corresponding author
Jörg Dirmaier, PhD
Department of Medical Psychology, University Medical Center Hamburg-Eppendorf,
Martinistr. 52 W26,
20246 Hamburg, Germany
Tel +49 40 7410 59137
Fax +49 40 7410 **54965**
Email dirmaier@uke.de

Section
Original article

Total word count: 5198 words + one figure and two tables

Acceptance of the German e-mental health portal www.psychenet.de: an online survey

Abstract

Background. Taking into account the high prevalence of mental disorders and the multiple barriers to the use of mental health services, new forms of fostering patient information, involvement, and self-management are needed to complement existing mental health services. The study aimed at investigating acceptance regarding design and content of the e-mental health portal www.psychenet.de.

Methods. An online cross-sectional survey was conducted between May 2013 and May 2015 using a self-administered questionnaire including items on perceived ease of use, perceived usefulness, attitude towards using, and perceived trust.

Results. The majority of the N=252 respondents suffered from mental disorders (n=139) or were relatives from persons with mental disorders (n=65). The portal was assessed as “good” or “very good” by 71% of the respondents. High levels of agreement (89-96%) were shown for statements on the perceived ease of use, the behavioral intention to use the portal, and the trustworthiness of the portal. Lower levels of agreement were shown for some statements on the perceived usefulness of the portals’ content. Lower educational levels were associated with lower agreement levels regarding comprehensibility (p=0.019) and readability (p=0.012).

Discussion. This survey provides preliminary evidence that the e-mental health portal www.psychenet.de appears to be a usable, useful and trustworthy information resource. The behavioral usefulness of the portals' content might be improved by integrating more activating patient decision aids. Targeting the content to the needs of users with lower educational levels might further enhance the portals' acceptance.

Introduction

Over a third of the total EU population suffers from mental disorders with anxiety and mood disorders being the most frequent mental disorders (Wittchen et al., 2011). However, mental disorders are often not detected; only about one third of patients receive adequate treatment, and access to treatment is complicated by system-related barriers (Mack et al., 2014). In most epidemiological studies, service use of mentally ill people ranges between 2% to 18% (Wang et al., 2007). Given the structural problems of the mental health care system, new forms of fostering patient information, involvement, and self-management are needed to complement existing mental health services. Therefore the development of innovative treatment approaches that are available to a large population is recommended (Christensen & Petrie, 2013).

Bridging the Gap through Web-based Health Applications

The Internet is widely seen as an effective complementary source for addressing these issues. As it reaches a large number of people, a reduction of barriers to the use of health services is facilitated by anonymity and high accessibility. It holds the opportunity to deliver interactive content that is tailored to the needs of the target group at comparatively low cost to a large number of users at the time, place and learning speed the individual user prefers (Arnberg et al., 2014). Internationally, health services have increasingly expanded into online environments leading to the development of e-mental health services that are designed to complement, rather than replace existing mental health services. They hold the opportunity to reach people who live in remote areas or those with disabilities and without easy access to health care services (Anderson, Henner & Burkey, 2013; Benavides-Vaello, Strode & Sheeran, 2013; Carrard et al.,

2006). Furthermore, people who refuse to seek out traditional services, especially those who wish to remain anonymous, may utilize e-mental health services (Townsend, Gearing & Polyanskaya, 2012). E-health services may empower patients to participate in treatment choices and to take control and responsibility about their own health and care by improving access to services and information (Alpay et al., 2010; Alpay, van der Boog & Dumaij, 2011; Xie et al., 2013). A German national survey found that people increasingly take advantage of these opportunities (Eichenberg, Wolters & Brahler, 2013).

However, the quality and usability of mental health information on the World Wide Web is limited (Reavley & Jorm, 2011) and the effectiveness of e-health interventions is limited by high attrition rates (Geraghty et al., 2013); most users visit health intervention websites only once (Brouwer et al., 2010; Verheijden et al., 2007). Additionally, reading levels of web-based patient materials are partially too high for the average user, not taking into account the large variance of health literacy in the population (Stossel et al., 2012). As persons with lower educational levels and respective persons with lower literacy levels might show less beneficial effect by using patient education materials (Goossens et al., 2014; Murphy et al., 2000), effects of educational levels on the acceptance should be accounted for in the interpretation of evaluation results.

The German E-mental Health Portal www.psychenet.de

A current project being part of the public-funded intersectoral research network psychenet - the Hamburg Network for Mental Health is aimed at developing and evaluating an e-mental health portal. With psychenet, the Federal Ministry of Education and Research contributes to strengthening healthcare regions in Germany by establishing new trans-sectoral cooperation and implementing and evaluating selected health care innovations (Härter et al., 2012). The portal

www.psychenet.de is intended to increase the users´ knowledge and to empower them to be active partners in medical decisions and the management of their mental strain.

In a first step, a basic version of the portal comprising evidence-based patient information on a wide range of mental disorders and about local treatment services was developed to complement a region-wide awareness campaign on mental health in the metropolitan area of Hamburg that includes an award-winning media campaign (placards, cinema ads, radio ads) and specific educational projects (Härter et al., 2012). In order to obtain first evidence about the usability of the website, common web metrics were obtained via open source web analysis tools (e.g. Google Analytics). As a following project step, various modules have been developed for six of the most common mental disorders - depression, somatoform disorders, eating disorders, alcohol use disorders, psychotic disorders, anxiety disorders (Wittchen et al., 2011); e.g. patient decision aids (PtDAs), self-help tools, and screening tools. According to the International Patient Decision Aid Standard (IPDAS) collaboration criteria (Elwyn et al., 2006), the development of the modules has been based on a comprehensive mixed-methods needs assessment (focus groups, online-survey) among patients, relatives, and health care professionals. The technical development of the website has been commissioned by a professional web-design agency. The design and content of the portal and the results on the usability of the website using web metrics are described in detail elsewhere (Dirmaier et al., 2015). While the information about treatment services refer to the metropolitan area of Hamburg and the media campaign and specific health education projects were restricted to this region, the other tools (e.g. evidence based patient information (including fact sheets on several mental disorders and other basic facts concerning mental health as well as PtDAs) and screening tools) are not targeted specifically to this region.

The present study aimed at investigating acceptance regarding design and content of the basic version of the e-mental health portal www.psychenet.de addressed at individuals with mental disorders, their relatives, service providers, and the interested public. The portal should be assessed through the following aspects of acceptance: 1) perceived ease of use, 2) perceived usefulness, 3) attitude towards using the website, 4) perceived trust, and 5) overall evaluation. A further aim was to explore effects of different educational levels on the portals' acceptance.

Methods

Design and participants

The research team employed an online cross-sectional study using a self-administered survey. Online convenience sampling was conducted on our e-mental health portal www.psychenet.de. On each page of the portal, teasers were sited linking to a short invitation to participate in the survey. Users being interested were referenced to the survey that was arranged following detailed information about the studies' aim, procedure, and data security. Adult users (18 years or over) who gave written informed consent to participate (asked at the beginning of the questionnaire) as well as consent to data use (asked when participants had finished the questionnaire) were included in the analyses. There were no additional inclusion or exclusion criteria.

Ethics Statement

Approval for the study was obtained from the ethics committee of the Hamburg Medical Association (Process number: PV4157).

Data collection

The data were collected between May 2013 and May 2015 (24 months). A short, face-validated questionnaire comprising 29 items was developed for the study. The questionnaire comprised 3 main sections: (1) baseline characteristics, (2) acceptance and usability, and (3) overall evaluation.

Baseline characteristics were elicited using four items on sociodemographic variables (age, gender, education, postal code). Furthermore, three items were used to explore respondents' experience with mental disorders (4 options), how they accessed the website (3 options), and how they learned about the website (8 options including the option for a free answer). Previous internet use was explored on a 3-point scale ("(almost) every day", "at least once a week", "at least once a month") and frequency of use of the portal was elicited on a 4-point scale ("first time", "< 5 times", "> 5 times", "> 10 times").

In order to assess acceptance of the portal, respondents rated 19 items on a 4-point Likert scale (1=agree, 2=somewhat agree, 3=somewhat disagree, 4=disagree). Number of scale points and wording of the Likert scale were defined based on Chang (1994). According to a previous study on the acceptance of an e-health application (de Graaf et al., 2013), participants were asked to rate statements covering 3 dimensions of the Technology Acceptance Model (TAM); see Davis (1989) and Chau & Hu (2002): *perceived ease of use* (10 items), *perceived usefulness* (7 items), and *attitude towards using* (2 items). The TAM dimensions were added by the dimension *perceived trust* (2 items) as it was shown to be a relevant quality criterion as seen by patients with long-term conditions and caregivers (Kerr et al., 2006) and affects consumers acceptance of health technologies (Lemire et al., 2008; Wu et al., 2008).

In order to elicit an overall rating of the portal, respondents' were asked to rate the portal on a 6-point scale based on the grading system used in German schools (1=very good, 2=good, 3=satisfactory, 4=sufficient, 5=deficient, 6=insufficient). Finally, a facultative open field for comments and suggestions for improvements was provided. Before the questionnaire was used, it was pilot tested among 10 student assistants and research assistants not participating in this study.

Data Analysis

Quantitative data analysis

The professional web-based online survey software EFS Survey (Questback GmbH) was used for the electronic data collection. The statistical software package PASW Statistics 18 (SPSS Inc., Chicago IL) was used to analyze the data. Data were primarily evaluated by quantitative descriptive data analysis. In order to quantify responses, means, standard deviations, and frequency distributions were calculated for each item on acceptance. Moreover, median, range, and frequency distribution were calculated for the overall rating.

To explore effects of education level on the acceptance of the website, one-way analyses of variance (ANOVAs) were conducted for interval scaled variables and Kruskal–Wallis H test for ordinal scaled variables. Bonferroni test was used for post hoc analyses. $P<0.05$ was considered to be significant for all analyses. The significance level was not adjusted as the tests served to generate hypotheses.

171 **Qualitative data analysis**

172 Qualitative data analysis was used to analyze the open field question using an inductive
173 approach. Responses were categorized into five main categories: 1) negative appraisals, 2)
174 positive appraisals, 3) suggestions for improvement, 4) not related to the website 5) no comment.
175 Responses that included a number of themes were subdivided into various units and separately
176 categorized. The coding was carried out by three members of the research team (LT, JT, SL).

177 Results

178 During a period of 24 months, 1030 visitors of the portal started the web-based user survey. Of
179 these, 314 completed the questionnaire (38.3% of those who agreed to participate). Finally, 252
180 participants gave their consent for the use of data (see Figure 1).

181 Participants

182 Of the 252 respondents, 55.2% (n=139) were affected from mental disorders. The respondents
183 were predominantly female (64.3%, n=162), well-educated (middle or high educational level:
184 75.8%, n=191) and had a mean age of 42.2 years (SD=15.0). The majority of the participants
185 (90.5%, n=228) are using the internet (almost) every day. 57.5% of respondents (n=145) stated
186 that they learned about the portal through online search for mental illnesses. 14.3% (n=36)
187 learned about the portal through the projects' media campaign (cinema adverts, poster, YouTube
188 channel, postcards). Of the total sample, 73.4% (n=185) reported that they were visiting the
189 portal for the first time. For detailed baseline characteristics and frequency distributions of access
190 paths and website use see Table 1.

Acceptance of the portal

Table 2 shows the percentage of users who agreed/disagreed to statements covering several aspects of acceptance, ordered separately for each dimension by the percentage of participants who agreed.

Perceived ease of use

89 to 96% of participants agreed with the particular statements concerning the perceived ease of use.

ANOVAs revealed main effects of educational level for two items associated with perceived ease of use. Respondents with low educational level showed significantly lower average agreement values (M=3.33, SD=0.89) compared to those with middle (M=3.67, SD=0.48) or high educational level (M=3.58, SD=0.70) referring to the statement 'the information on the website is easy to understand' ($F_{(2;249)}$=4.03, p=0.019). Likewise, participants reporting low educational level exhibited significantly lower average agreement values (M=3.44, SD=0.83) compared to those with middle (M=3.76, SD=0.43) or high educational level (M=3.69, SD=0.60) referring to the statement 'the font of the website is easy to read' ($F_{(2;249)}$=4.53, p=0.012).

Perceived usefulness

Concerning the perceived usefulness, the items concerning the usefulness of the content (interesting, new, appropriate amount of information, helpful, useful) gained the highest level of approval (79-93%). Lower levels of agreement from the perspective of the respondents living with mental disorders were shown for statements concerning the improvement of the communication with relatives or health care providers (51 respectively 60%). Concerning the

affected peoples' relatives, 72% confirmed that they were now able to talk better about mental disorders with their relative being affected.

ANOVAs yielded no significant main effects of educational level for items associated with perceived usefulness.

Attitude towards using the website

Concerning the attitude towards using the website, more than 90% of the respondents agreed that they would recommend the website to others respectively would revisit the website if needed.

ANOVAs yielded no significant main effects of educational level for items associated with the attitude towards using the website.

Perceived trust

The majority of respondents (94-96%) agreed that the information on the website was trustworthy and that the information on the website was up to date.

For items associated perceived trust, ANOVAs yielded no significant main effects of educational level.

Overall evaluation

Almost three thirds of the respondents (71.4%, n=180) assessed the website as "very good" (n=60) or "good" (n=120). 21.0% of the participants (n=53) rated the website as "satisfactory" (n=39) or "sufficient" (n=14). Only 7.5% (n=19) marked the website as "deficient" (n=13) or "insufficient" (n=6). Overall, the ratings of the whole sample displayed a median of 2.0 (IQR=1-6).

Kruskal–Wallis H test revealed that there was no significant effect of educational level on overall evaluation.

Qualitative analysis

The open field question was responded by 58 participants. The answers were subdivided into 64 different statements. Seven participants explicitly mentioned that they had no comment. Five statements addressed the online survey and one statement addressed the general attitude towards people with mental disorders. All other statements refer directly to the e-health portal. There were 31 suggestions for improvement (e.g. the need for additional tools or topics, more in-depth information or regional expansion). Fifteen positive appraisals addressed knowledge and empowerment, the appropriate depth of information and the usefulness for newly diagnosed people among other topics. There were five negative appraisals concerning, for example, incomprehensible information (too many technical terms) or the insufficient suitability for adults with bipolar disorders.

Discussion

As a consequence of multiple barriers in mental health service provision and access, a considerable proportion of persons living with mental disorders do not receive adequate treatment (Wang et al., 2007). Internationally, but not yet in Germany, mental health services have increasingly expanded into online environments leading to the development of e-mental health services. Within the framework of an intersectoral research network the e-health portal www.psychenet.de addressed at individuals with mental disorders, their relatives and service

252 providers has been developed recently. In this online study, acceptance regarding design and
253 content of the portal was investigated.

254 In the present study, 252 users of the e-mental health portal www.psychenet.de were included.
255 Overall, the portal was assessed as "good" or "very good" by a substantial percentage of
256 respondents (71%). Moreover, high degrees of approval of more than 88% were found for
257 statements on perceived ease of use. Comparable rates of agreement were found in an evaluation
258 study on the usability of a web-based patient information system for individuals with severe
259 mental health problems (Kuosmanen et al., 2010). Likewise, high levels of agreement of more
260 than 90% were shown for statements on the behavioral intention to use the portal or to
261 recommend it to others (i.e. attitude towards using) and regarding the trustworthiness of the
262 portal. Lower levels of agreement were partly shown for some statements on the perceived
263 usefulness with the lowest degree of approval of 79% for the statement 'by using this website I
264 have learned something new'. Lowest levels of agreement of 51-60% were shown for statements
265 on the usefulness of the portal on a behavioral level (e.g. 'now I'm able to talk even better about
266 mental disorders with my health professional) within the group of respondents being affected by
267 mental disorders. However, a higher proportion of agreement of 72% was found among relatives
268 that participated in the survey regarding the behavioral usefulness of the portal. In a recent study,
269 Berk et al. (2013) reported comparatively higher levels of agreement regarding the usefulness of
270 a website containing guidelines for caregivers of adults with bipolar disorder. Likewise, a study
271 on the acceptance of a web-based e-health intervention for parents of children with infantile
272 hemangiomas showed higher agreement rates (de Graaf et al., 2013). It is assumed, that the
273 higher acceptance was due to the fact that the respective website was aimed at one target group
274 (caregivers) and one narrowly defined topic (bipolar disorders, infantile hemangiomas).

However, in an evaluation study on the user acceptance of a website for cancer patients with a more broad range of topics, higher levels of agreements were reported for ease of use (87%) compared to usefulness (79%) as it was also shown for the current study (Wallwiener et al., 2010). Additionally, it should be noted that such comparisons are difficult to interpret as the studies probably varied substantially with respect to relevant characteristics such as ways of recruitment, response rates and users' experience with the respective portal.

ANOVAs indicated that respondents with low educational levels showed lower levels of agreement regarding aspects of comprehensibility and readability. As effects of educational level were only found for these two single items and not for other items or the overall evaluation, it is not assumed, that users with lower educational levels might generally benefit less from the information presented at the portal compared with users with higher educational levels. Studies investigating the acceptance of the portal among disadvantaged groups of users (e.g. low socioeconomic and educational levels) with a special focus on the comprehensibility of the information need to be conducted and, based on the results, the content of the portal should be adapted concerning comprehensibility and readability. This study supports the imperative to engage diverse group of users (i.e. affected people, relatives, professionals) in the early stages of development and evaluation in order to optimize the usefulness of online interventions (Nilsen et al., 2006).

This analysis of acceptance offers preliminary evidence that the e-mental health portal www.psychenet.de appears to be a usable, useful and trustworthy publically available information resource for adults living with mental illness and their relatives. The acceptance of the portal is further resembled by the high percentage of respondents' that agreed their intention to recommend and to revisit the portal in case of necessity. The results of the web-analysis

298 reported by Dirmaier et al. (2015) confirmed that the website is usable and highly accessed.
299 Nonetheless, lower agreement levels concerning the usefulness of the portal on a behavioral level
300 were observed. Thus, integrating content that support active patient behavior regarding
301 communication with relatives and with the health care provider as provided by high quality
302 patient decision aids (PtDAs) might improve the usefulness of the e-health portal. Three of the
303 four PtDAs were only available during the last weeks of the survey period. In order to further
304 improve acceptance of the portal by targeting the offers of the portal to the users' needs,
305 qualitative studies are requested to identify topics that are of high relevance to the users but have
306 not been addressed until now.

307 Limitations

308 Due to methodological limitations the results of the study need to be interpreted with caution.
309 First of all, convenience sampling was used by informing users about the survey without
310 attracting attention and not actively recruiting. This resulted in a relatively small number of
311 respondents, given that 14.000 to 36.000 visitors per month were registered during the
312 investigation period through web analysis software. It is assumed, that respondents might have
313 had an incentive to participate in the study as a consequence of being either particularly satisfied
314 or dissatisfied with the offers presented at the portal. However, the positive ratings of the
315 respondents suggest that they might have been motivated rather by their satisfaction than
316 dissatisfaction with the system. As we do not know if the investigated sample was representative
317 the results presented here might overestimate the acceptance of the portal. Future evaluations
318 should be conducted using probability sampling methods to confirm the present findings.

As we used hardly any standardised instrument, the comparability of our results is limited. However, the questionnaire was developed based on widespread theories and evidence on acceptance of information technologies (Chau & Hu, 2002; Davis, 1989; Kerr et al., 2006; Lemire et al., 2008; Wu et al., 2008) and pilot tested among 10 participants. Furthermore, in order to provoke a definitive choice, no mid-point was provided. Due to the forced choice, the use of a 4-point scale might have led to a biased rating. However, Weijters, Cabooter & Schillewaert (2010) assumed that ambivalent or neutral respondents tend to rate negatively in the absence of a midpoint.

Conclusions

Despite the methodological limitations, this study provides first evidence on the acceptance of the e-mental health portal www.psychenet.de. The results on the usefulness of the portal showed that there is still room for improvement. Within the framework of this project, PtDAs for common mental disorders (i.e. depression, anxiety disorders, psychosis) supporting active user behavior were developed and implemented on the e-health portal www.psychenet.de based on a comprehensive mixed-methods needs assessment study. In addition to the PtDAs, self-management tools are currently being evaluated.

While fact sheets, screening tools as well as information on the media campaign and the help system in Hamburg were implemented before the application of this online survey, the PtDAs were completed during the investigation period: The PtDA on depression is available online since March 2014, the PtDAs on generalized anxiety disorder, psychosis and return to work are only available since February respectively beginning and end of April 2014. Since the PtDAs

were not available during the whole investigation period, it is suggested that the integration of these tools might improve the usefulness of the portal. It is assumed that the portal empowers people with mental disorders and their relatives by facilitating to gather high-quality evidenced-based information about their illness, to rapidly find the right treatment services without great effort, and to prepare for health care provider contacts. It might be assumed that it is essential to include multiple groups of users (specifically disadvantaged users) in the development and evaluation of websites. As the final step of the project, an evaluation of the usefulness of the PtDAs is conducted using qualitative and quantitative methods.

Acknowledgements

psychenet is a project network in the region of Hamburg which consists of more than 80 scientific and medical institutions, counselling centers, the Senate and the Chamber of Commerce of the Free and Hanseatic City of Hamburg, companies, as well as patients' and relatives' associations (2011–2014). The vision of the project is to promote mental health today and in the future, concerning early diagnosis and effective treatment of mental illnesses. For more information and a list of all partners please visit www.psychenet.de.

References

Alpay L, Henkemans OB, Otten W, Rovekamp TA, Dumay AC. 2010. E-health applications and services for patient empowerment: directions for best practices in The Netherlands. *Telemed J E Health* 16:787-791. doi: 10.1089/tmj.2009.0156

Alpay L, van der Boog P, Dumaij A. 2011. An empowerment-based approach to developing innovative e-health tools for self-management. *Health Informatics J* 17:247-255. 10.1177/1460458211420089

Anderson C, Henner T, Burkey J. 2013. Tablet computers in support of rural and frontier clinical practice. *Int J Med Inform* 82:1046-1058. 10.1016/j.ijmedinf.2013.08.006

Arnberg FK, Linton SJ, Hultcrantz M, Heintz E, Jonsson U. 2014. Internet-delivered psychological treatments for mood and anxiety disorders: a systematic review of their efficacy, safety, and cost-effectiveness. *Plos One* 9:e98118. 10.1371/journal.pone.0098118

Benavides-Vaello S, Strode A, Sheeran BC. 2013. Using technology in the delivery of mental health and substance abuse treatment in rural communities: a review. *J Behav Health Serv Res* 40:111-120. 10.1007/s11414-012-9299-6

Berk L, Berk M, Dodd S, Kelly C, Cvetkovski S, Jorm AF. 2013. Evaluation of the acceptability and usefulness of an information website for caregivers of people with bipolar disorder. *BMC Med* 11:162. 10.1186/1741-7015-11-162

Brouwer W, Oenema A, Raat H, Crutzen R, de Nooijer J, de Vries NK, Brug J. 2010. Characteristics of visitors and revisitors to an Internet-delivered computer-tailored lifestyle intervention implemented for use by the general public. *Health Educ Res* 25:585-595. 10.1093/her/cyp063

Carrard I, Rouget P, Fernández-Aranda F, Volkart A-C, Damoiseau M, Lam T. 2006. Evaluation and deployment of evidence based patient self-management support program for bulimia nervosa. *Int J Med Inform* 75:101-109. 10.1016/j.ijmedinf.2005.07.031

Chang L. 1994. A Psychometric Evaluation of 4-Point and 6-Point Likert-Type Scales in Relation to Reliability and Validity. *Applied Psychological Measurement* 18:205-215.

Chau PYK, Hu PJ. 2002. Examining a model of information technology acceptance by individual professionals: An exploratory study. *Journal of Management Information Systems* 18:191-229.

Christensen H, Petrie K. 2013. State of the e-mental health field in Australia: Where are we now? *Aust N Z J Psychiatry* 47:117-120. 10.1177/0004867412471439

388 Davis FD. 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of
389 Information Technology. *Mis Quarterly* 13:319-340. Doi 10.2307/249008

390 de Graaf M, Totte J, Breugem C, van Os-Medendorp H, Pasmans S. 2013. Evaluation of the
391 Compliance, Acceptance, and Usability of a Web-Based eHealth Intervention for Parents
392 of Children With Infantile Hemangiomas: Usability Study. *JMIR Res Protoc* 2:e54.
393 10.2196/resprot.2897

394 Dirmaier J, Liebherz S, Sänger S, Härter M, Tlach L. 2015. Psychenet.de: development and
395 process evaluation of an e-mental health portal. *Inform Health Soc Care*:February 24,
396 2015: 2010.3109/17538157.17532015.11008486.

397 Eichenberg C, Wolters C, Brahler E. 2013. The internet as a mental health advisor in Germany -
398 results of a national survey. *Plos One* 8:e79206. 10.1371/journal.pone.0079206

399 Elwyn G, O'Connor A, Stacey D, Volk R, Edwards A, Coulter A, IPDAS Collaboration. 2006.
400 Developing a quality criteria framework for patient decision aids: online international
401 Delphi consensus process. *British Medical Journal* 333:417-419.

402 Geraghty AW, Torres LD, Leykin Y, Perez-Stable EJ, Munoz RF. 2013. Understanding attrition
403 from international Internet health interventions: a step towards global eHealth. *Health*
404 *Promot Int* 28:442-452. 10.1093/heapro/das029

405 Goossens E, Van Deyk K, Zupancic N, Budts W, Moons P. 2014. Effectiveness of structured
406 patient education on the knowledge level of adolescents and adults with congenital heart
407 disease. *Eur J Cardiovasc Nurs* 13:63-70. 10.1177/1474515113479231

408 Härter M, Kentgens M, Brandes A, Bock T, Dirmaier J, Erzberger M, Furstenberg W,
409 Hillebrandt B, Karow A, von dem Knesebeck O, Konig HH, Lowe B, Meyer HJ, Romer
410 G, Rouhiainen T, Scherer M, Thomasius R, Watzke B, Wegscheider K, Lambert M.
411 2012. Rationale and content of psychenet: the Hamburg Network for Mental Health. *Eur*
412 *Arch Psychiatry Clin Neurosci* 262 Suppl 2:S57-63. 10.1007/s00406-012-0359-y

413 Kerr C, Murray E, Stevenson F, Gore C, Nazareth I. 2006. Internet interventions for long-term
414 conditions: patient and caregiver quality criteria. *J Med Internet Res* 8:e13.
415 10.2196/jmir.8.3.e13

416 Kuosmanen L, Jakobsson T, Hyttinen J, Koivunen M, Valimaki M. 2010. Usability evaluation of
417 a web-based patient information system for individuals with severe mental health
418 problems. *J Adv Nurs* 66:2701-2710. 10.1111/j.1365-2648.2010.05411.x

419 Lemire M, Pare G, Sicotte C, Harvey C. 2008. Determinants of Internet use as a preferred source
420 of information on personal health. *Int J Med Inform* 77:723-734.
421 10.1016/j.ijmedinf.2008.03.002

Mack S, Jacobi F, Gerschler A, Strehle J, Hofler M, Busch MA, Maske UE, Hapke U, Seiffert I, Gaebel W, Zielasek J, Maier W, Wittchen HU. 2014. Self-reported utilization of mental health services in the adult German population - evidence for unmet needs? Results of the DEGS1-Mental Health Module (DEGS1-MH). *Int J Methods Psychiatr Res* 23:289-303.

Murphy PW, Chesson AL, Walker L, Arnold CL, Chesson LM. 2000. Comparing the effectiveness of video and written material for improving knowledge among sleep disorders clinic patients with limited literacy skills. *South Med J* 93:297-304.

Nilsen ES, Myrhaug HT, Johansen M, Oliver S, Oxman AD. 2006. Methods of consumer involvement in developing healthcare policy and research, clinical practice guidelines and patient information material. *Cochrane Database of Systematic Reviews* Issue 3:CD004563. 10.1002/14651858.CD004563.pub2

Reavley NJ, Jorm AF. 2011. The quality of mental disorder information websites: a review. *Patient Educ Couns* 85:e16-25. 10.1016/j.pec.2010.10.015

Stossel LM, Segar N, Gliatto P, Fallar R, Karani R. 2012. Readability of patient education materials available at the point of care. *J Gen Intern Med* 27:1165-1170. 10.1007/s11606-012-2046-0

Townsend L, Gearing RE, Polyanskaya O. 2012. Influence of health beliefs and stigma on choosing internet support groups over formal mental health services. *Psychiatr Serv* 63:370-376. 10.1176/appi.ps.201100196

Verheijden MW, Jans MP, Hildebrandt VH, Hopman-Rock M. 2007. Rates and determinants of repeated participation in a web-based behavior change program for healthy body weight and healthy lifestyle. *J Med Internet Res* 9:e1. 10.2196/jmir.9.1.e1

Wallwiener M, Wallwiener CW, Brucker SY, Hartkopf AD, Fehm TN, Kansy JK. 2010. The Brustkrebs-Studien.de website for breast cancer patients: User acceptance of a German internet portal offering information on the disease and treatment options, and a clinical trials matching service. *BMC Cancer* 10:663. 10.1186/1471-2407-10-663

Wang PS, Angermeyer M, Borges G, Bruffaerts R, Tat Chiu W, G DEG, Fayyad J, Gureje O, Haro JM, Huang Y, Kessler RC, Kovess V, Levinson D, Nakane Y, Oakley Brown MA, Ormel JH, Posada-Villa J, Aguilar-Gaxiola S, Alonso J, Lee S, Heeringa S, Pennell BE, Chatterji S, Ustun TB. 2007. Delay and failure in treatment seeking after first onset of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 6:177-185.

Weijters B, Cabooter E, Schillewaert N. 2010. The effect of rating scale format on response styles: The number of response categories and response category labels. *Int J Res Mark* 27:236-247. http://dx.doi.org/10.1016/j.ijresmar.2010.02.004

457 Wittchen HU, Jacobi F, Rehm J, Gustavsson A, Svensson M, Jonsson B, Olesen J, Allgulander
458 C, Alonso J, Faravelli C, Fratiglioni L, Jennum P, Lieb R, Maercker A, van Os J, Preisig
459 M, Salvador-Carulla L, Simon R, Steinhausen HC. 2011. The size and burden of mental
460 disorders and other disorders of the brain in Europe 2010. *Eur Neuropsychopharmacol*
461 21:655-679. 10.1016/j.euroneuro.2011.07.018

462 Wu JH, Shen WS, Lin LM, Greenes RA, Bates DW. 2008. Testing the technology acceptance
463 model for evaluating healthcare professionals' intention to use an adverse event reporting
464 system. *Int J Qual Health Care* 20:123-129. DOI 10.1093/intqhc/mzm074

465 Xie B, Wang M, Feldman R, Zhou L. 2013. Internet use frequency and patient-centered care:
466 measuring patient preferences for participation using the health information wants
467 questionnaire. *J Med Internet Res* 15:e132. 10.2196/jmir.2615

Figure caption

Figure 1. Flow chart.

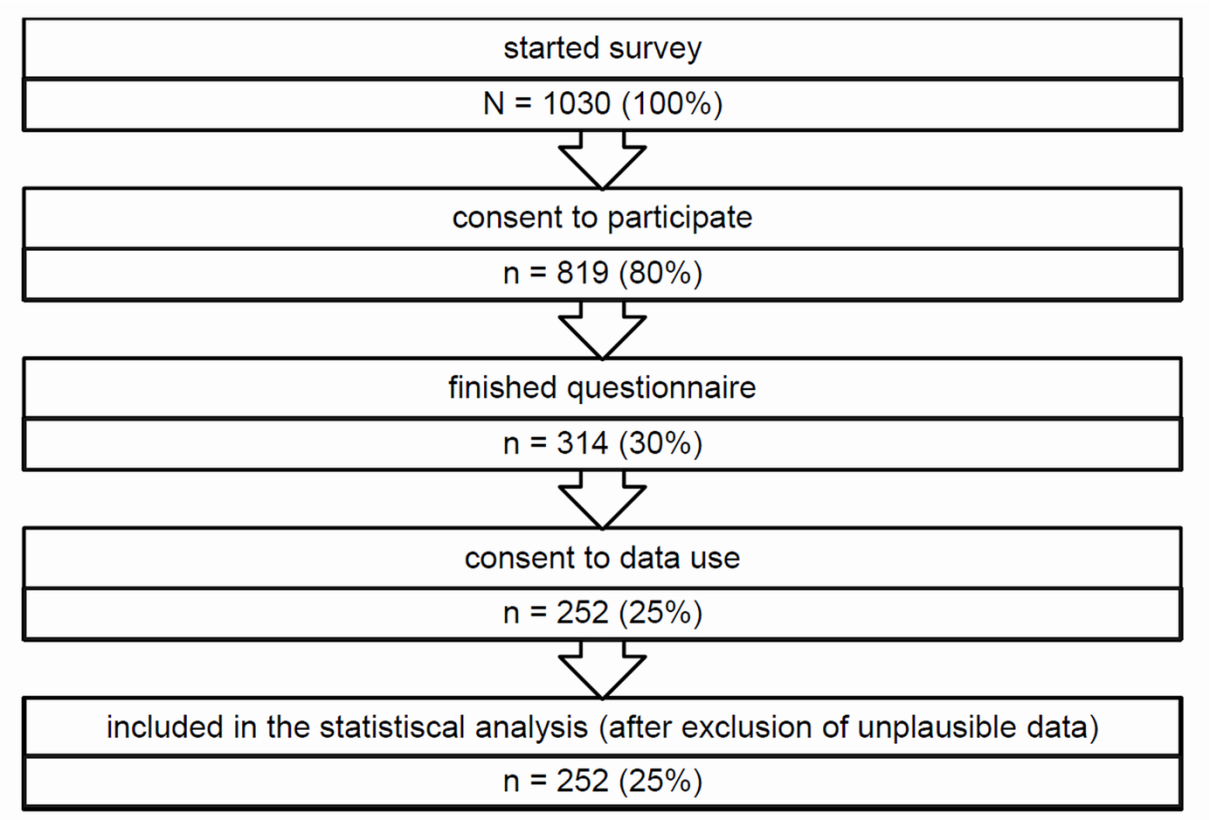

Table captions

Table 1. Descriptive characteristics and frequency distributions of access paths and website use (N=252).

Variables		**n**	**%**
Gender	Female	162	64.3
Age (M=42.2, SD=15.0)	≤ 45	135	53.6
	> 45	117	46.4
Education	Low	61	24.2
	Middle	66	26.2
	High	125	49.6
Experience with mental disorders	Affected people	139	55.2
	Relatives	65	25.8
	Experts	25	9.9
	None	23	9.1
Residential area	North Germany	85	33.7
	Other regions	167	66.3
Internet usage	(Almost) every day	228	90.5
	At least once a week	21	8.3
	At least once a month	2	0.8
Access to the portal	Directly	122	48.4
	Via search engine	102	40.5
	Via referring website	28	11.1
Awareness of the portal through	Online searches for mental illnesses	145	57.5
	Personal recommendation	27	10.7
	Newspaper article	19	7.5
	Cinema advert	19	7.5
	Poster	7	2.8
	YouTube	6	2.4
	Postcard	4	1.6
	Other	60	23.8
Frequency of use	First time	185	73.4
	< 5 times	42	16.7
	> 5 times	12	4.8
	> 10 times	13	5.2

473 **Table 2.** User ratings on perceived ease of use, perceived usefulness, attitude towards using the portal, and perceived trust (N=252).

Variables	agree	somewhat agree	somewhat disagree	disagree
Perceived ease of use	**% (n)**	**% (n)**	**% (n)**	**% (n)**
The font of the website is easy to read	71.0 (179)	25.0 (63)	1.6 (4)	2.4 (6)
The website is easy to use	58.7 (148)	33.7 (85)	5.2 (13)	2.4 (6)
The presentation of the information is clearly arranged	52.0 (131)	39.7 (100)	4.4 (11)	4.0 (10)
The design of the website is appealing	52.8 (133)	39.3 (99)	4.8 (12)	3.2 (8)
The information on the website is easy to understand	63.5 (160)	30.2 (76)	3.2 (8)	3.2 (8)
The colors of the website are pleasant	54.0 (136)	38.5 (97)	5.6 (14)	2.0 (5)
The pictures on the website are appropriate	44.0 (111)	46.8 (118)	6.3 (16)	2.8 (7)
I can quickly find the information that is important to me	48.0 (121)	40.5 (102)	6.3 (16)	5.2 (13)
Perceived usefulness	**% (n)**	**% (n)**	**% (n)**	**% (n)**
The content of the website is interesting	61.1 (154)	31.7 (80)	4.4 (11)	2.8 (7)
All in all, the website is useful for me	48.8 (123)	40.1 (101)	8.3 (21)	2.8 (7)
The amount of information presented on the website is appropriate	44.8 (113)	43.3 (109)	8.7 (22)	3.2 (8)
The website contains information that I need	47.2 (119)	40.1 (101)	9.5 (24)	3.2 (8)
The information on the website has helped me with my concerns	40.1 (101)	42.9 (108)	12.7 (32)	4.4 (11)
Through the website, I received references to other sources	39.7 (100)	44.8 (113)	11.9 (30)	3.6 (9)
By using this website I have learned something new	37.3 (94)	41.3 (104)	15.5 (39)	6.0 (15)
Now I'm able to talk better about mental disorders with my relative being affected[a]	21.5 (14)	50.8 (33)	21.5 (14)	6.2 (4)
Now I'm able to talk better about mental disorders with my health professional[b]	20.9 (29)	38.8 (54)	19.4 (27)	20.9 (29)
Now I'm able to talk better about mental disorders with my relative[b]	23.7 (33)	27.3 (38)	26.6 (37)	22.3 (31)
Attitude towards using	**% (n)**	**% (n)**	**% (n)**	**% (n)**
I would recommend the website to others	55.6 (140)	34.5 (87)	6.0 (15)	4.0 (10)
I will revisit the website if needed	64.3 (162)	28.6 (72)	4.4 (11)	2.8 (7)
Perceived trust	**% (n)**	**% (n)**	**% (n)**	**% (n)**
The information on the website is trustworthy	59.1 (149)	36.9 (93)	2.0 (5)	2.0 (5)
The information on the website is up to date	48.0 (121)	45.6 (115)	4.0 (10)	2.4 (6)

474 [a] Sample size was reduced to n=65 respondents that reported being relative of a person with mental disorders

475 [b] Sample size was reduced to n=139 respondents that reported being affected by a mental disorder