Needs and Demands for e-Mental Health Interventions in Individuals with Overweight and Obesity: User-Centred Design Approach

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Abstract

Introduction: Several studies indicate an association between mental disorders and overweight or obesity. E-Mental health interventions offer an effective way to overcome barriers to health care access for individuals with overweight and obesity. The objective of this study was to examine the needs and demands for e-mental health interventions among individuals with overweight and obesity. *Methods:* A cross-sectional study was conducted from 2020 to 2021 in Germany. A total of 643 participants were recruited through specialized social media platforms and the Alfried-Krupp hospital in Essen, Germany. Sociodemographic and medical data were analysed, as well as data on depressive symptoms and on the needs and demands for e-mental health interventions. *Results:* Contact with and recommendation by experts appear to be key aspects in the acceptance and use of e-mental health interventions. In summary, most participants preferred a 20–30-min weekly session via smartphone over a 4-month period. The highest preference in terms of features included practicing coping skills and being provided with information; in regard to desired topics, nutrition consultation, quality of life, and adapting to new life situations were considered most important. *Discussion:* e-Mental health interventions can be highly beneficial for individuals, especially when developed through a user-centred design approach. The results of the study indicate which content and design are preferred and, thereby, provide valuable information for consideration when developing a tailored e-mental health intervention.

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Introduction

Overweight and obesity, both defined as abnormal or excessive fat accumulation that can affect health [1], have increased worldwide since 1980 [2]. The WHO defines overweight for adults as a body mass index (BMI) greater than or equal to 25 and obesity as a BMI greater than or equal to 30 [1]. In 2016, more than 1.9 billion adults aged 18 years and older were overweight, and of those, more than 650 million were obese [1]. The prevalence of

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obesity has nearly tripled since 1975 and is considered a major global health challenge [3], also referred to as a global pandemic [4].

Overweight and obesity are associated with serious health risks as well as increased mortality. Here, the risk for comorbidities is greater in individuals with obesity than in individuals who are overweight [5]. Overweight and obesity accounted for an estimated 3.4–4 million deaths [6, 7] and were linked to more deaths worldwide than underweight [1], to 3.9% of life years lost, and to 3.8% of disability-adjusted life years worldwide in 2010 [6]. Further, obesity increases the likelihood of non-communicable diseases such as diabetes, hypertension, coronary heart disease, stroke, certain cancers, obstructive sleep apnoea, and osteoarthritis [2] and is the fifth leading cause of death worldwide [8]. In Germany, its increasing prevalence and associated secondary diseases have resulted in considerable costs for health and social systems [9]. Hence, overweight and obesity are topics of high public health relevance [9].

Moreover, not only the risk of somatic diseases rises with increased obesity but also the likelihood of developing mental disorders such as depression [10, 11], anxiety [10], adjustment and personality disorders [12], and dysfunctional eating behaviours [12]. Thus, there is evidence that obesity and mental illness are linked [13], but the mechanisms of the association between the two remain unclear [14].

Obesity and depression, in particular, have a significant and bidirectional relationship [15]. One study found that adolescents who were depressed had a 70% increased risk of being obese, and conversely, obese adolescents had a 40% increased risk of being depressed [16]. There may be several reasons for this relationship. One important factor may be that individuals with obesity suffer from social prejudice and discrimination not only from the public but also from health professionals [5, 17, 18]. In both clinical and nonclinical samples of obese adults, weight stigma has been shown to be a significant risk factor for depression [19–24], low self-esteem [25, 26], and body dissatisfaction [27–29]. Individuals with obesity are also more reluctant to seek medical help due to social stigma [5, 30] and less likely to attend age-appropriate cancer screenings, with potentially serious consequences [30]. As individuals with obesity are at high risk for weight-related comorbidities, quality health care is critical. In addition to the consequences of stigma, there may be other barriers that make psychotherapeutic treatment, in particular, more difficult. These include individual barriers, such as lack of knowledge about treatment options, motivational deficits (e.g., due to long waiting times), and protective behaviours or structural barriers such as insufficient cross-sector collaboration, a regional lack of care options, and long waiting times for psychotherapy slots [31].

One approach to overcoming some of the barriers noted above may be innovative e-mental health solutions. The term e-mental health is widely defined to encompass the use of electronic capabilities such as cell phones, computers to augment medical care [32], and e-mental health interventions are distinctive for their flexibility regarding place and time of use and, thereby, can overcome some structural barriers [33]. In addition, Klein et al. [34] found that high levels of stigma were associated with a preference for e-mental health; thus, it could be concluded that obese people would be more likely to use e-mental health interventions.

Several studies that examined the efficacy of such e-mental health interventions in the treatment of multiple mental disorders as well as health-related outcomes showed results comparable to in-person therapy [35–38]. However, Eysenbach [39] noted as early as 2005 that participants in e-mental health trials tend to drop out, calling this the "law of attrition" and pointing to the need to develop e-health dropout models. Only a few studies have demonstrated the effectiveness of e-mental health interventions [40], and their utilization remains low [41–44].

Current research shows low to moderate acceptance of e-mental health interventions [45–51]. Lack of acceptance could be a contributor to the overall low uptake and compliance rates [52–55]. Consequently, identifying the factors that motivate individuals to accept e-mental health interventions is critical. Crisp et al. [56] found that individuals who were interested in participating in e-mental health interventions for depression were more likely to be older, female, separated/divorced, and highly educated; to report a current or past history of depression; to have more depressive symptoms; and to have low personal stigma. These findings align with those of Donkin et al. [57], who similarly examined factors associated with the probability of participating in an online cognitive therapy programme for depression.

Recent studies have found that user acceptance is influenced by individual characteristics. For this reason, it is recommended that future needs and the social environment of the target population should be taken into consideration before planning e-mental health interventions [44, 58]. The results support the importance of theory-driven, user-centred design approaches in e-mental health development [58]. Such approaches are also recommended to promote participants' adherence to the e-mental health intervention. In the context of digital interventions,

adherence can be described as active or effective use or as the intensity of use as specified by developers [59]. Therefore, adherence to e-mental health interventions is a prerequisite for their effectiveness [60]. Kelders et al. [61] found that one of the most relevant factors for adherence is the extent to which the content and design of digital interventions are tailored to the needs and characteristics of users. Thus, involving the target group in the development of e-mental health programmes appears to be crucial and implies asking them about their needs and demands regarding content and design.

Existing e-mental health interventions to date primarily provide information and interactive tasks based on cognitive behavioural therapy, psychodynamic therapy, or acceptance and commitment therapy [45]. Obesity-specific e-health interventions exist but are mainly aimed at promoting adequate healthy behaviours in the natural environment [62], reducing weight or preventing obesity, or controlling blood sugar for obese diabetes patients [63–66]. Recent evidence shows that participants who reported poorer baseline mental health were less likely to attend weight management programme sessions, used fewer resources, and participated less in study assessments [67]. This reiterates the need for a holistic approach to e-mental health interventions that is not limited to weight loss. In addition, the results of a recent study demonstrated that participants in a digital CBT study lost significantly more weight, indicating the importance of a multidimensional approach [68]. However, to date, we are not aware of any study that has developed and examined an e-mental health intervention with the main goal of reducing mental distress such as depressive symptomatology based on a user-centred design approach.

Objectives

The aim of this study was to determine the needs and demands regarding content and design of e-mental health interventions to reduce mental distress in individuals with overweight and obesity. In addition, this study aimed to investigate the difference in terms of content preferences between individuals with overweight and obesity and between different degrees of obesity. Further, the study aimed to assess depressive symptoms and the acceptance of e-mental health interventions in individuals with overweight and obesity. Consistent with previous research in other target groups, overall acceptance of e-mental health interventions among individuals with overweight and obesity is expected to be moderate. Based on the results of the study, future e-mental health interventions aiming to reduce mental distress can be conceptualized.

Materials and Methods

Study Design and Participants

An online, cross-sectional survey study design was applied to assess the specific needs and demands of patients with overweight and obesity regarding to a user-centred design approach. Participants were recruited from July 2020 to May 2021 via groups directed towards patients seeking, undergoing, or having previously undergone bariatric surgery at the Obesity Centre at Alfried-Krupp Hospital, Essen, Germany, and a social media channel (Facebook). Potential participants were informed that the survey should find out which topics, needs, and support services are important to the participants and should ask about the need for innovative support services (e-health interventions). The eligibility criteria included being 18 years old or older, possessing a good command of the German language, having internet access, and having a BMI considered as overweight or obesity. We classified the obesity degrees according to the WHO [1] as follows: (i) obesity degree I (BMI: 30–34.9 kg/m^2), (ii) obesity degree II (BMI: 35–39.9 kg/m^2), and (iii) obesity degree III (BMI ≥40 kg/m^2); we classified overweight/pre-obesity as BMI: 25–29.9 kg/m^2.

The online survey took about 18 min to complete. Electronic informed consent was obtained before the survey started. Participation was completely anonymous and voluntary. No financial compensation was offered. Of 2,603 participants who began the survey, 643 (24.7%) completed it. Of these participants, 117 people were underweight or normal weight and thus excluded from the study. This resulted in a total sample of 526 participants. The survey was approved by the Ethics Committee of the Essen Medical Faculty (19-89-47-BO) and conducted in accordance with the Declaration of Helsinki.

Measures

The survey included several items regarding sociodemographic (sex, age, marital status, educational level, occupational status, and net monthly income) and medical data (height, weight, highest and lowest adult weight, presence of somatic or mental disease).

After assessing sociodemographic and medical data, a validated mental health measure, the Patient Health Questionnaire-8 (PHQ-8), was applied. The PHQ-8 measures depression symptoms via eight items on a four-point Likert-type scale (from 0 = not at all to 3 = nearly every day) [66]. A score ≥10 indicates current depression. Cronbach's α in this study was 0.85, proving high internal consistency.

Further, data related to the needs and demands of individuals with obesity were assessed. In detail, (un)suitable formats for delivering weight- or illness-related topics were assessed on a four-point Likert-type scale ("How suitable do you find the following formats for conveying weight- and illness-related topics?"). We assessed availability, format, features, timing of use, trustworthiness, and search method of the e-mental health intervention via multiple choices of formats, features, etc. ("In your opinion, how should an online support offer look/be structured?"). We also evaluated the preferred framework of the e-mental health intervention and topics that should be addressed by e-mental health interventions for different age groups and BMI categories. The lists of suitable formats and features were developed based on current literature in the field of psychosomatic practice and through expert interviews with experts from psychosomatic medicine [69], obesity [70], bariatric surgery [70], and digital health [71, 72].

Additionally, we assessed the following variables related to the experience with online-based programmes for health promotion ("What do you already know about internet-based health promotion programs?") on a five-point Likert-type scale from "do not agree" to "do agree" for the items "I do know about it," "I know how the programs work," and "I know where to find these programs" and the question "Have you already had experience with e-mental health interventions (e.g., Make It Training, deprexis)?" with the answer options "Yes, I already have experience," "Yes, I know about the possibility of using an offer but have not tried any of them," or "No, I am not aware of the possibility of using an offer."

To assess acceptance of an e-mental health intervention programme, the subscale "behavioural intention"/"intention to use" of a modified version of the Unified Theory of Acceptance and Use of Technology (UTAUT) model was used [73]. The model comprises 15 items, and answers are selected based on a five-point Likert-type scale (from 1 = totally disagree to 5 = totally agree). Three items each measure the underlying predictors of acceptance, operationalized as "intention to use" ("I would like to try a psychological online intervention," "I would use a psychological online intervention if offered to me," and "I would recommend a psychological online intervention to my friends"). Cronbach's α value was 0.88 for acceptance (behavioural intention).

Statistical Analyses

The data analysis was performed using SPSS Statistics 26 Software (IBM, New York). The level of significance was set at $\alpha = 0.05$ (two-sided tests). Patients were sorted into BMI categories according to WHO guidelines [1]. Participants' BMIs were calculated by dividing their body weight by their height in metres squared. The behavioural intention scale (= acceptance) of the UTAUT model was calculated. Acceptance (BI) of UTAUT was categorized according to low (1–2.34), moderate (2.35–3.67), and high (3.68–5) acceptance.

Descriptive statistics were conducted in the form of distributions, mean scores, and standard deviations for all self-generated items. Additionally, frequencies of the experience with online-based programmes for health promotion, (un)suitable formats for delivering weight- or illness-related topics, availability, format, features, timing of use, trustworthiness, search method, framework, and topics of the e-mental health intervention were calculated. On the five-point Likert-type scale, the options "very" and "mostly" as well as "less" and "not" were summarized as categories (positive and negative agreement). The sum score for the PHQ-8 was computed. One-way ANOVAs and post hoc tests (Bonferroni) were applied to investigate the subjects that should be addressed by e-mental health interventions for BMI categories.

Results

Study Population

Of 526 participants, 88.6% ($n = 466$) were female. The mean age in years was M = 44.94 (SD = 10.74). In the study population, 15.0% ($n = 79$) of the participants had a BMI (kg/m²) considered overweight (pre-obese), 15.4% ($n = 81$) were obese (class I), 16.7% ($n = 88$) were obese

Table 1. Sociodemographic and medical characteristics

	N	%
Sex		
Female	466	88.6
Male	60	11.4
Age		
18–34 years	99	18.8
35–54 years	311	59.1
≥55 years	116	22.1
BMI		
Overweight (pre-obese)	79	15.0
Obese (class I)	81	15.4
Obese (class II)	88	16.7
Obese (class III)	278	52.9
Marital status		
Single	81	15.4
Married	282	53.6
In a relationship	92	17.5
Divorced/separated	55	10.5
Widowed	10	1.9
Other	6	1.1
Educational level		
University education	76	14.4
Higher education entrance qualification	115	21.9
Higher secondary education	237	45.1
Lower secondary education	85	16.2
None/other	13	2.5
Employment		
Employed	355	67.5
Not employed	171	32.5
Income		
No income	9	1.7
0–1,000	57	10.8
1,001–2,000	122	23.2
2,001–3,000	144	27.5
3,001–4,000	93	17.7
4,001–5,000	64	12.2
5,001–6,000	23	4.4
6,001 or higher	14	2.8
Somatic illness		
Yes	331	62.9
No	195	37.1
Bariatric surgery		
Yes	259	49.2
Planned	170	32.3
No	97	18.4
Type of bariatric surgery		
Sleeve gastrectomy	135	25.7
Gastric bypass surgery	76	14.4
Mini gastric bypass	29	5.5
Gastric balloon	1	0.2
Other	18	3.4
PHQ-8		
<10	189	54.9
≥10	156	45.1
Total	526	100

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(class II), and 52.9% (*n* = 278) of the participants were obese (class III). The mean BMI was M = 40.84 (SD = 9.34). The mean PHQ-8 score was M = 9.60 (SD = 5.70); 45.1% of the individuals scored above the cutoff of ≥10, indicating current symptoms of depression. For a detailed description of the study sample, see Table 1.

e-Mental Health Needs and Demands of Individuals with Overweight and Obesity
Experience with Online-Based Programmes for Health Promotion
Just over half (52.3%) of the participants reported that they could picture an online-based programme for health promotion (10.1% totally agreed, 42.2% rather agreed), 34.8% reported knowing how such programmes work (5.7% totally agreed, 29.1% rather agreed), and 39.9% reported knowing how to find such programmes (7.2% totally agreed, 32.7% rather agreed). Of the participants with obesity and overweight, 2.1% responded that they had used online-based psychological interventions previously, and 17.5% indicated that they were aware of the possibility of using such services but had not used them yet. The majority of the participants (80.4%) were not aware of online-based psychological interventions.

(Un)suitable Formats for Delivering Weight- or Illness-Related Topics
Personal contact with experts (82.1%) and exchanges in groups (73.0%) of affected individuals (face-to-face meetings) were considered suitable/very suitable for delivering weight- or illness-related topics. Further, exchanges in groups of affected people in social networks (63.3%), expert contact in apps/web programmes (60.5%), expert contact in social networks (59.9%), blogs (57.4%), and information pages (51.5%) were mostly seen as suitable or very suitable, while videos or podcasts (42.2%), self-help programmes on social networks online (37.8%), and informative emails (35.7%) were considered less suitable/unsuitable. For an overview of the distribution of responses, see online supplementary Table I (for all online suppl. material, see www.karger.com/doi/10.1159/000527914).

Needs and Demands of the e-Mental Health Intervention
Regarding the duration of the psychological support, the participants indicated that they prefer more than 4 months of guidance (54.9%). Most preferred a weekly format of new intervention material (68.6%) over a daily (13.5%) or an every other week format (10.5%).

Table 2. Number of responses (in total number and percentage) concerning framework, availability, format, features, timing of use, trustworthiness, and search method of the e-health intervention

	N (%)
Duration	
Up to 1 week	11 (2.1)
1–4 weeks	37 (7.0)
1–4 month	135 (25.7)
More than 4 month	289 (54.9)
Frequency of new material	
Daily	71 (13.5)
Weekly	361 (68.6)
Every 2 weeks	55 (10.5)
Length of session	
1–10 min	36 (6.8)
10–20 min	143 (27.2)
20–30 min	253 (48.1)
More than 30 min	78 (14.8)
Availability	
Smartphone/iPhone	481 (91.4)
Computer/laptop	353 (67.1)
Tablet/iPad	303 (57.6)
Format	
Web programme (web app/website)	334 (63.5)
Smartphone app	408 (77.6)
Informative webpage	267 (50.8)
Download material	340 (64.6)
Audio/video material	324 (61.6)
Interactive tasks and exercises	369 (70.2)
Features	
Provide information	417 (79.3)
Develop connections/explanatory models together	364 (69.2)
Practice coping skills for certain situations	438 (83.3)
Features that encourage application in everyday life	427 (81.2)
Timing of use	
Short waiting periods	77 (14.6)
Shortly before or after important health-/illness-related appointments	88 (16.7)
In quiet moments, when you can concentrate completely on the programme	463 (88.0)
Anytime	131 (24.9)
Trustworthiness	
Recommendation from friends/acquaintances	148 (28.1)
Recommendations on the internet	30 (5.7)
Recommendation from government institutions	325 (61.8)
Recommendation from experts	499 (94.9)
Search method	
Online search engine	340 (64.6)
Consulting experts	380 (72.2)
Hospital websites	314 (59.7)

N = 526.

Additionally, most participants would rather have 20–30-min sessions (48.1%) than shorter or longer sessions. In terms of availability, smartphones (91.4%)

Table 3. Response frequencies (in total number and percentage) for subjects that should be addressed by e-mental health intervention

	Unimportant	Less important	Neutral	More important	Very important
Nutrition consultation	5 (1.0)	12 (2.3)	28 (5.3)	158 (30.0)	323 (61.4)
Coping with sadness	16 (3.0)	36 (6.8)	124 (23.6)	181 (34.4)	169 (32.1)
Health-related information	2 (0.4)	16 (3.0)	77 (14.6)	215 (40.9)	216 (41.1)
Coping with mental overload	11 (2.1)	19 (3.6)	69 (13.1)	184 (35.0)	243 (46.2)
Self-confidence	13 (2.5)	17 (3.2)	62 (11.8)	146 (27.8)	288 (54.8)
Coping with physical change	5 (1.0)	12 (2.3)	51 (9.7)	205 (39.0)	253 (48.1)
Quality of life	5 (1.0)	6 (1.1)	49 (9.3)	190 (36.1)	276 (52.5)
Adjusting to new life situations	5 (1.0)	7 (1.3)	50 (9.5)	169 (32.1)	295 (56.1)
Sexuality/intimacy	46 (8.7)	64 (12.2)	182 (34.6)	133 (25.3)	101 (19.2)
Maintaining a positive outlook	9 (1.7)	9 (1.7)	61 (11.6)	179 (34.0)	268 (51.0)
Faith/spirituality	166 (31.6)	85 (16.2)	195 (37.1)	51 (9.7)	29 (5.5)
Self-care	18 (3.4)	18 (3.4)	99 (18.8)	185 (35.2)	206 (39.2
Relaxation techniques	23 (4.4)	38 (7.2)	125 (23.8)	193 (36.7)	147 (27.9)

N = 526.

were considered best, while tablets/iPads (57.6%) were considered least suitable by participants. Nevertheless, more than 50% of the participants found tablets to be suitable. Accordingly, the participants rated smartphone apps (77.6%) as the best format for e-mental health interventions. Informative web pages (50.8%) received the least approval. Practicing coping skills (83.3%) for certain situations was rated as the best feature, while developing connections/explanatory models together (69.2%) was considered the least important feature. Regarding timing of use, most participants preferred quiet moments when they can fully concentrate on the programme (88.0%) and least often the option of short waiting periods (14.6%). For a detailed overview of responses, see Table 2 and online supplemenatry Table IV. The participants indicated that recommendations from experts were the most trustworthy (94.9%), while recommendations on the internet (5.7%) were the least trustworthy option. When participants were asked how they would search for interventions, most responded that they would search for consulting experts (72.2%). Fewer answered that they would search for hospital websites (59.7%).

Subjects That Should Be Addressed by e-Mental Health Interventions

The analysis of the obesity-related topics that should be addressed by e-mental health interventions shows that the participants considered the topics nutrition consultation (91.4%), quality of life (88.6%), and adjusting to new life situations (88.2%) to be most important. By contrast,

the topics faith/spirituality (47.8%) and sexuality/intimacy (20.9%) were less important to most individuals. For a detailed overview of responses, see Table 3.

Considering the BMI categories, the importance of the topic coping with sadness differed significantly between the group before applying the Bonferroni correction ($F_{(3, 522)} = 2.65$, $p = 0.048$). After the Bonferroni correction of coping with sadness, no BMI category differed significantly from the other groups (all $p \geq 0.067$). See also online supplementary Tables II and III. The comparison between overweight and all groups of obesity (I-III) showed no significant differences.

Acceptance of Online-Based Psychological Interventions (UTAUT Acceptance Scale)

Behavioural intention (= acceptance) was moderate (M = 3.12, SD = 1.13) in the overall population. Nearly a third, 28.1% (*n* = 148), reported low acceptance (1–2.34); 43.2% (*n* = 227) responded with moderate acceptance (2.35–3.67); and high acceptance (3.68–5) was reported by 28.7% (*n* = 151) of the participants.

Discussion

This study examined the needs and demands regarding content and design of e-mental health interventions in individuals with overweight and obesity. It also investigated whether there is a difference in terms of content preference between individuals with overweight and

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obesity and between different degrees of obesity. Further, this study assessed the acceptance of e-mental health interventions in individuals with overweight and obesity.

Just over half the participants reported that they could imagine using an e-mental health intervention; however, 80% of participants were unaware of such health care solutions. These findings are consistent with the results of a representative survey in Germany, in which the majority of respondents said they had not known about the possibility of online counselling [41]. In order to accept and use new interventions, one must first be aware of them. Thus, this result highlights the importance of developing strategies to increase public awareness and knowledge of the efficacy of internet-based treatments to ultimately increase acceptance. Current research also suggests that efforts should focus on improving public knowledge about internet interventions, including providing information about their effectiveness to promote acceptance and adherence [42]. Because acceptance-promoting interventions can easily be distributed through experts or official public health information channels, this could be a promising way to increase awareness and knowledge of internet interventions and, thus, their acceptance in the general population.

Fittingly, in terms of trustworthiness, participants considered expert recommendations to be the most trustworthy. When asked how participants would seek interventions, most responded that they would turn to experts. Thus, contact with and recommendations by experts seem to be very important key aspects in the acceptance and use of e-mental health interventions. This finding should be considered when implementing future e-mental health interventions for individuals with overweight and obesity.

Regarding acceptance of an e-mental health intervention, the results are consistent with previous studies conducted with other target groups that also show a low to moderate acceptance of e-mental health interventions [45–49]. However, it should be considered that studies on acceptance have often measured acceptance of e-mental health interventions without having developed a concrete intervention [45, 46]. Consequently, it is of great relevance for future research to develop a concrete application and to evaluate it afterwards. Moreover, it is important to note that the acceptance of technology-based innovations can change rapidly with their introduction as a routine measure, and results can, therefore, represent only snapshots [74]. This reaffirms the need to first develop and then evaluate a concrete intervention. While 8.58% of the German population exceeded the threshold of 10 on the

PHQ-8, 45.1% of participants in this study met and exceeded this threshold [75]. This indicates that almost half of all participants suffer from current depressive symptoms [75]. Nevertheless, more than half do not seem to suffer from such symptoms, and since acceptance of e-mental health interventions is associated with depressive symptoms [51, 56], it may be that acceptance is lower because depression scores were not high enough.

When examining which design participants prefer and what type of programme they would prefer, our study found a strong preference for using an e-mental health intervention on the smartphone. This result is consistent with the usage patterns of the population in Germany, which in 2018 were about 87% for smartphones, followed by 65% for laptops, 62% for computers, and 46% for tablets (destatis.de). Using an e-mental health intervention on a smartphone can be beneficial and increase usage in everyday life as smartphones (unlike computers) are usually turned on and within arm's reach [76].

Regarding the duration of the e-mental health intervention, more than half of all participants preferred more than 4 months of care. Most preferred a weekly dose of new intervention material with a preferred length of 20–30 min. With regard to the formats for delivering weight- or illness-related topics, *personal contact with experts* is considered the most appropriate approach for teaching weight- or disease-related topics. This tendency aligns with previous research showing a general preference for in-person therapies over internet interventions [34, 77]. But also *expert contact in social in apps or webs* and *rxpert in social networks* are rated as very suitable. Again, the importance of contacting experts is evident, which should be considered in any future development of an e-mental health intervention.

In terms of desired features, practicing coping skills for specific situations was rated as the best attribute. As people often react to psychological strain by changing their dietary patterns [78], this could suggest that eating serves as a dysfunctional coping strategy for many individuals with overweight and obesity and that other strategies that do not lead to weight gain and other negative consequences are desired. A recent study found that overweight participants were significantly more likely to engage in passive coping strategies such as self-criticism, wishful thinking, and social withdrawal, as well as unhealthy eating behaviours such as emotional eating and restrained eating than normal-weight individuals [79]. Fittingly, an experimental study found that eating a small amount of sweets such as chocolate can lead to mood

elevation, indirectly helping to manage stress [80]. Hence, stress-related eating may be a contributing factor to the development of obesity [81], which is why addressing alternative stress management mechanisms with individuals with overweight and obesity is extremely relevant. Another study claims that depression increases the likelihood of external, reactive, and emotional eating through increased impulsivity and lack of emotion recognition [82], so this could be a vicious cycle that needs to be interrupted.

Moreover, providing information was regarded as an important feature of an application. Psychoeducation is an essential part of behavioural therapy, and our results indicate that the participants in the study are interested in understanding their disorder and acquiring knowledge to help themselves. Regarding desired topics, nutrition consultation, quality of life, and adjusting to new life situations are considered to be most important by the participants, while the topics faith/spirituality and sexuality/intimacy are less important to most participants. Since most topics seem to be of interest to participants and there are no significant differences between BMI categories, it would probably be reasonable to offer many topics and allow for individualized use.

Limitations

The following limitations should be considered when interpreting the results. As all data presented here were collected via an online survey, possible selection bias cannot be ruled out. As the data are based on self-reporting, an objective verification of the weight or obesity degree is not possible. Furthermore, the development of the questionnaire regarding the needs and demands of the e-mental health interventions was based on the expertise of our working unit and not on qualitative interviews, which could have been conducted beforehand and should be considered for future studies. Moreover, the gender distribution in the study sample is not representative of the overweight and obese population since more women (88.6%) than men participated in this study. This could be because participants were recruited widely through social media groups (obesity surgery-related groups, whose members are almost exclusively women). With this recruiting method, it can also be assumed that respondents are more interested in and more willing to participate in internet-related topics from the onset than randomly selected participants with different interests, which should be considered. Furthermore, more than half the participants were classified as third-degree obese, which is also not representative of the distribution in society [83]. In addition to this unbalanced distribution of participants from different obesity groups, a significantly high number had already undergone bariatric surgery (49.2%) or were planning to undergo it (32.3%), which should also be considered. All of these sampling biases limit the generalizability of the results of the study, and thus, whether the sample examined is sufficiently representative must be questioned. Because e-mental health interventions often have preventive functions, it may be important to screen more overweight and first- and second-degree obese individuals in the future, and since more men than women are overweight in Germany, including more men in the study on the need and demands of e-mental health interventions is highly relevant [83]. Despite these limitations, this study provides a practicable approach to investigating the needs and demands of individuals with overweight and obesity for e-mental health interventions. Further research is recommended and should consider the above-mentioned limitations.

Conclusion

In summary, this study shows that e-mental health interventions for individuals with overweight and obesity are an option for about half the participants, although 80% were not even aware of such health solutions. The results of the study suggest that awareness of the existence of effective e-mental health interventions may be a key factor in increasing their acceptance. Moreover, it appears that participants trust expert recommendations the most, so both awareness and acceptance may be increased if experts would recommend a specific e-mental health intervention. In addition, a strong preference for using e-mental health interventions on a smartphone was identified. Overall, contact with and recommendations by experts seem to be important factors that positively influence the acceptance and adherence of potential participants. Accordingly, based on the needs and demands identified in this study, future research should develop and evaluate a need-based intervention. This user-centred design approach should be examined for its awareness, acceptance, and adherence, and, thus, its effectiveness.

Statement of Ethics

All participants gave written informed consent. The study was approved by the Ethics Committee of the Essen Medical Faculty (19-89-47-BO).

Conflict of Interest Statement

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Data Availability Statement

All data generated or analysed during this study are included in this article and its online supplementary material files. Further enquiries can be directed to the corresponding author.

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