

How adults with suspected depressive disorder experience online depression screening: A qualitative interview study

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ABSTRACT

Background: While evidence on the effects and mechanisms of online depression screening is inconclusive, publicly available ‘online depression tests’ are already frequently used. To further a comprehensive understanding of online depression screening and evince the perspectives of those affected, we aimed to qualitatively explore how adults with undiagnosed but suspected depressive disorder experience the screening process.

Methods: This study is a qualitative follow-up of a German-wide, 3-arm, randomised controlled trial on feedback after online depression screening conducted between Jan 2021 and Sep 2022. A subsample of 26 participants with undiagnosed but suspected depressive disorder (Patient Health Questionnaire-9 ≥ 10 ; no depression diagnosis/treatment within the last year) were purposefully selected based on maximum variation in gender, age, and study arm. In-depth semi-structured telephone interviews (mean = 37 min) were conducted approximately six months after screening. Data were analysed within a contextualist theoretical framework using inductive reflexive thematic analysis.

Results: Participants were balanced in terms of gender (female/male, $n = 15/11$), age (range = 22 to 61 years), and study arm (no feedback/standard feedback/tailored feedback, $n = 7/11/8$). Reported experiences of online depression screening can be described as a two-step process: Step 1 is the initial reaction to the screening procedure and comprises the theme *recognition of depressive symptoms: from denial to awareness*. Step 2 describes a subsequent self-explorative process encompassing the themes *cognitive positioning: rejection vs. acceptance*, *emotional reaction: between overload and empowerment*, and *personal activation: from reflection to action*.

Conclusions: Findings indicate that online depression screening with and without feedback of results is experienced as a two-step process promoting symptom recognition and subsequent self-exploration. While few participants reported negative effects, the majority described the screening process as insightful, empowering, and activating. Future research should determine to what extent online depression screening may pose a standalone form of low-threshold support for individuals with undiagnosed depressive disorder, while focusing as well on potential negative effects.

1. Background

Major depression is one of the most disabling and most prevalent disorders worldwide (GBD 2019 Mental Disorders Collaborators, 2022). Yet, affected individuals still often go undetected: In primary care, for example, only 50 % of depressed patients are correctly diagnosed and treated (Mitchell et al., 2009; Trautmann and Beesdo-Baum, 2017), and patients who eventually make a treatment contact do so with an average delay of eight years after depression onset (Wang et al., 2005). Without treatment, however, depressive symptoms can worsen over time,

resulting in an increased likelihood of a chronic course, a worse treatment outcome, rising healthcare costs, and an increased disease burden (Kraus et al., 2019).

While traditional service uptake is low, individuals increasingly seek mental health information on the internet (Berger et al., 2005; Eichenberg et al., 2013), with the use of online depression screening being on the rise. In 2020, for example, nearly 2.6 million online mental health screeners were completed through the website of only one American mental health organisation (Mental Health America; Krusan et al., 2022) - which joins a multitude of other health-related platforms and apps that

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provide publicly available online depression screening. The so called 'online depression tests' typically use self-report measures of depression symptom severity (e.g., the Patient Health Questionnaire-9) and then provide individuals with feedback on their results, sometimes supplemented by links or referrals to services. Aiming at empowering individuals to better understand and act on their symptoms, depression screening with feedback may provide an important form of support to affected individuals and is proposed to be a promising approach to promote early detection and subsequent resolution of undiagnosed depression (Hassem, 2022; Kohlmann et al., 2020; Krusan et al., 2022; Löwe et al., 2016; Sikorski et al., 2021).

Despite growing public use and recognition of online depression screening as a promising way of early detection, evidence in this field is limited and inconsistent. With regard to psychometric validity for example, a systematic review identified that the screening accuracy of thirteen examined online depression screeners varied significantly across different samples as well as between and within conditions and instruments (Martin-Key et al., 2022). Few studies also addressed the screening efficacy, i.e. the actual merit of the resulting diagnostic information to patient-related outcomes such as help-seeking. In one observational study on users of a depression screening app who received feedback on their results, approximately 38 % of participants reported to have consulted a health professional after one month (BinDhim et al., 2016). Another study investigated online search behaviour after completion of online mental health screening and found that individuals who underwent online depression screening were more likely to conduct subsequent depression-related online searches (Jacobson et al., 2022). More rigorous research, however, has failed to confirm positive effects on help-seeking: In the only published randomised controlled trial on online depression screening, feedback (vs. no feedback) of screening results had no significant effect on professional help-seeking three months later (Batterham et al., 2016).

In addition to providing an only inconclusive picture of the effects and potential mechanisms of online depression screening, this quantitative evidence further omits the voices and perspectives of those affected. Qualitative research, by contrast, has the potential to both complement the understanding of the complexity of online depression screening and provide insights into the life-worlds and subjective health needs of affected individuals using it. However, so far only one study has addressed the individuals' perspectives in this matter: By conducting focus groups with young adults who voluntarily sought a screening website, this study showed that online depression screening met young adults' emotional needs for validation and self-understanding. It further suggested that online screening can serve as a transition point in young people's mental health journeys (Krusan et al., 2022). Although this study expands on quantitative findings by highlighting the potential value of the screening process itself, it is restricted to a very young population and did not exclude cases already diagnosed and/or in care.

In the present study, we seek to further a comprehensive understanding of online depression screening by exploring the perspectives of adults of all ages who are undiagnosed but screened positive for at least moderate depressive symptomatology within a randomised controlled trial. Specifically, we aim to better understand how adults with undiagnosed but suspected depressive disorder experience the screening process.

2. Methods

2.1. Study context and design

The study was conducted as a qualitative follow-up of a randomised controlled trial (RCT) on feedback after online depression screening, conducted nationwide in Germany between January 2021 and September 2022 (see Sikorski et al., 2021, for the study protocol; main manuscript under preparation). After completing online depression screening with the Patient Health Questionnaire-9 (PHQ-9, Kroenke

et al., 2001), a total of 1178 participants with undiagnosed but suspected depressive disorder (PHQ-9 \geq 10) were randomised to get either no feedback ($n = 391$), standard feedback ($n = 393$), or tailored feedback ($n = 394$) on the screening result. Online assessments were conducted at baseline, 1-month, and 6-months follow-up and were complemented by diagnostic telephone interviews (SCID) at baseline and 6-months follow-up.

This qualitative study is based on a purposefully selected subsample of participants who were interviewed following the 6-months follow-up assessment. The research question was addressed within a paradigmatic framework of contextualism, assuming that observable data is informative of an existing reality, but does not straightforwardly reflect it. In alignment with an explorative design and in order to capture participants' experiences as close to their own accounts as possible, data analysis was approached inductively.

2.2. Study sample

Participants of the RCT were required to be aged 18 years or above, screen positive for suspected depressive disorder (PHQ-9 \geq 10), provide contact details, have sufficient German language as well as computer literacy, have internet access, and be willing to give informed consent. Participants were excluded if they reported to have been diagnosed with or treated for depression within the past 12 months.

The present subsample was purposefully selected, adopting maximum variation sampling to strive for an in-depth understanding across a wide range of perspectives rather than empirical generalisability (Palinkas et al., 2015). Individuals were selected based on variation in the following primary sampling criteria: gender (male, female), study arm (no feedback, standard feedback, tailored feedback), and age (<40 years, \geq 40 years), and, if feasible, also variation in reported depression history (depression diagnosis in the past yes vs. no; self-report) and depression severity at time of screening (moderate, severe; PHQ-9). To reduce the probability of possible bias by extreme cases, the aim was to recruit two participants per combination of primary sampling criteria (age, gender, study arm), i.e. 24 participants in total.

2.3. Recruitment

The RCT was promoted nationwide as a 'German-wide study on stress and psychological well-being' (www.discover-studie.de). The aim of evaluating online depression screening was not explicitly communicated, but interested participants were informed that some of them will get feedback on a part of their answers. Participants were recruited from the general population through traditional and social media, print advertisement in public areas, and a population wide online access survey panel to strive for a balanced composition of the sample (January 2021 to February 2022). Participation was compensated with vouchers worth up to 15 euros.

Recruitment for the qualitative study was conducted on an ongoing basis at the end of the 6-months follow-up interview of the RCT (July 2021 to August 2022). In this context, the study was presented to participants as being part of the first author's (FS) PhD project. Out of 1075 interviewed participants, 806 gave oral consent to be contacted for the qualitative study. Subsequently, 135 participants who met maximum variation sampling criteria were provided with detailed study information via email. Of those, 26 participants returned electronic or written informed consent and were scheduled for an interview appointment. Participation was compensated with 10 euros (vouchers).

2.4. Online depression screening and feedback

The PHQ-9 (Kroenke et al., 2001; German translation: Löwe et al., 2002) is a widely used and easily administered depression screening tool. For the recommended cut off point of 10, it demonstrates robust

psychometric characteristics and a high discriminatory performance for detecting a major depression in both the paper-pencil and the online version (Du et al., 2017; Erbe et al., 2016; Miller et al., 2021). It consists of nine items covering all major depression symptom criteria as stated in the DSM-5 ('Over the past two weeks, how often have you been bothered by any of the following problems?'). Each item is scored on a 4-point Likert scale ranging from 'not at all' (0) to 'nearly every day' (3), resulting in a total score ranging from 0 to 27 with scores of 10 and 15 indicating moderate and severe depressive symptoms.

The PHQ-9 was embedded in a baseline survey comprising additional questions on personal data, sociodemographic characteristics, and other health-related outcomes (e.g., depression-related illness beliefs). Participants who indicated elevated suicidal ideation (PHQ-9 suicide item ≥ 2) were directly shown a screen providing an advice to urgently seek help and relevant information on available help services (e.g. general practitioner, local psychiatric emergency units, and the national emergency number). After completing the survey, all randomised participants were thanked for participating in the study and received information on follow-up procedures.

In case participants received feedback, it consisted of (1) the depression screening result, (2) a note to seek diagnostic consultation by a health professional, (3) brief general information on depression, and (4) information on depression treatment with direct links to referenced health or social services (see the study website for a German demo). In extension to the standard version, the tailored feedback was personalised to participants' characteristics as follows: by phrasing screening result (1) and general information on depression (3) according to participants' symptom profiles and indicated causal attributions (e.g., 'You have indicated that you had *low spirits*, *sleep disturbances*, and *loss of energy* during the past two weeks. '), by matching the note to seek further consultation (2) to participants' specialist preferences (general practitioner vs. mental health professional), and by adapting help seeking advices (4) to participants' health insurance provider and local residency (e.g. by providing links to self-help groups located nearby). Additionally, after being provided with the screening result (1), participants were asked whether they think that their symptoms were indications of depression and whether they worried about the symptoms. According to participants' answers, the following three feedback sections were arranged in a differing order and were phrased slightly differently (see Fig. 1 and supplemental Fig. III in Sikorski et al., 2021, for examples).

2.5. Data collection

A semi-structured interview guide was developed to structure qualitative data collection. Initial questions on motivation for participation in the RCT and symptoms experienced at that time aimed at helping participants to recall the screening situation. Subsequent questions focused on the experience of screening questions or feedback, related health behaviour, an evaluation of the feedback provided, and attitudes towards online depression tests in general (see Supplementary Table 2). The interview guide was discussed in a doctoral colloquium on qualitative research and was piloted within the research team and with the first study participant, resulting in small modifications. Demographic and clinical characteristics of participants were obtained from the RCT (see Sikorski et al., 2021).

Interviews were conducted via telephone from July 2021 to August 2022 by FS, with two interviews each accompanied by another study team member. Probes and clarifying questions were used to encourage participants to elaborate on their experiences and to express both positive and negative accounts in order to reduce possible bias. Due to the explorative nature of the research question, discussions were also guided

by what FS interpreted to be meaningful to the interviewee. Interviews were audiotaped, pseudonymised and transcribed verbatim by trained student research assistants (MSc Psychology candidates). Transcription followed the rules of Dresing and Pehl (2015), with all transcripts being checked for correctness by FS. Interviews took place on average 211 days after screening ($SD = 20.9$) and the mean length was 37 min (range: 15 min to 1 h 14 min).

2.6. Data analysis

Data were analysed using reflexive thematic analysis, a theoretically flexible and interpretative approach to identify themes within and between participants' accounts in qualitative data (Braun and Clarke, 2006, 2019, 2021). In line with the contextualist paradigm, analysis was approached through a critical realist epistemological perspective, i.e. assuming the existence of an external reality, but acknowledging that the way individuals make meaning of their experience and therefore access to knowledge is socially influenced. Data interpretation followed an experiential orientation, i.e. examining accounts and meaningfulness as ascribed by participants. For coding, a research question-led, inductive approach with both semantic and latent coding was adopted. The analytic process followed Braun and Clarke's (2006) six-phase process: (1) Familiarisation with the data was done by re-listening and -reading all interviews and by taking notes on first impressions. (2) Coding as well as (3) developing, (4) reviewing and (5) naming of themes were conducted in an organic, iterative and recursive process. In line with our research design, themes were developed by clustering codes around a 'central organising concept' (Braun and Clarke, 2019) drawing on meaningfulness rather than frequency of mentions as a central criterion. The process concluded with (6) selecting appropriate quotations and producing the report.

Data analysis was conducted using the software MAXQDA (version 2022) and was led by FS and supervised by the last author SK (August 2022 to February 2023). Both authors met regularly to reflect on potential pre-assumptions, interpretations of codes, and theme development to achieve reflexive engagement with data and ultimately agreement on themes. Translation of cited quotations from German to English language considered the transfer of meaning, sense, and context and was conducted by FS, followed by a final discussion with SK. For the report, some quotations were edited for brevity purposes (indicated by [...]) and grammatical and spelling errors were corrected to facilitate readability and comprehension. Quotations are marked with a corresponding participant number, gender, age range, and study arm.

2.7. Researcher statement

FS is a female clinical psychologist conducting a psychodynamic psychotherapy training and a PhD training programme, in which she is attending monthly colloquia on qualitative research. SK (PhD, CBT psychotherapist) and BL (MD, CBT and psychodynamic psychotherapist) are both senior researchers experienced with both quantitative and qualitative research on depression.

2.8. Ethics and good clinical practice

The study is designed and reported according to the COREQ and the JARS-QUAL guidelines for qualitative research (Levitt et al., 2018; Tong et al., 2007; see Supplementary Table 1 for the filled COREQ checklist) and specific guidelines for promoting more deliberate and reflexive engagement in thematic analysis research (Braun and Clarke, 2021). All procedures involved in the study have been approved by the Ethics

Committee of the University Medical Center Hamburg-Eppendorf (June 2021, reference: 0337).

3. Results

3.1. Participant characteristics

Maximum variation sampling was achieved, with only one under-recruited combination due to little response (young males without feedback, $n = 1$) and one over-recruited combination due to mis-categorisation (young females with standard feedback, $n = 5$). The resulting subsample of 26 participants was balanced in terms of gender (female/male, $n = 15/11$), study arm (no/ standard/ tailored feedback, $n = 7/11/8$), and age strata ($<40/ \geq 40$ years, $n = 14/12$). Age ranged from 22 to 61 years with a mean of 48.8 years ($SD = 12.9$). At time of screening, participants reported on average severe depressive symptoms (PHQ-9, $M = 15.4$, $SD = 4.77$), with 13 participants each displaying moderate and severe depressive symptoms. More than half of the participants did not have any depression diagnosis in the past ($n = 14$). Most participants were in a relationship ($n = 21$) and cohabiting ($n = 20$). Most participants worked ($n = 19$) and about two third reported a high-educated level ($n = 17$; International standard classification of education [ISCED], UNESCO Institute for Statistics, 2012). The 19 participants from the feedback study arms spent on average 13 min on the feedback screen ($SD = 28$), with 12 participants reporting to remember having received feedback at the 6-months follow-up. None of the participants reported negative effects attributed to screening or study participation. Selected characteristics per participant are presented in Supplementary Table 3.

3.2. Themes

Most participants offered diverse accounts of how they experienced online depression screening, which we organised into four themes. As illustrated in Fig. 1, we found these themes to follow a two-step process: Step 1 is the initial reaction to the screening procedure and comprises the theme *recognition of depressive symptoms: from denial to awareness*. Step 2 describes a subsequent self-explorative process that encompassed up to three themes: *cognitive positioning* describes the participants' reports on how they related to an illness-related self-identity in reaction to the screening. *Emotional reactions* reported by the participants were often ambivalent and ranged between the poles of overload and empowerment. Many participants also described a *personal activation*

ranging from self-reflection to taking action, i.e. seeking support. The themes summarised in step 2 were often found to be mutually reinforcing, with participants emphasising different themes in varying degrees of intensity. All themes are described in detail in the following sections.

3.2.1. Recognition of depressive symptoms: from denial to awareness

Many participants discussed recognising their depressive symptoms, predominantly as a reaction to the screening questions. By seeing themselves reflected or 'mirrored' by the questions, they perceived their distress or current life problems more intensely. Further, they became aware of symptoms that they did not consciously perceive before. Often, participants reported to have 'ignored' or 'played down' symptoms prior to the screening:

"There were questions where I wasn't aware before that it bothers me or that it affects me, [...] for example] eating behaviour. [...] And sometimes you don't want to be aware of it, you often know it, but you talk yourself out of it. But when you then answer [the questions], then you realise 'oh no - there's something wrong'." (P2, female, 20–29 years, no feedback)

In this context, participants described the questions as 'eye-opening', 'awakening' or as leading to a sense of 'realisation' of the severity of their condition. This included the recognition that they did not feel well, and the classification of their condition as 'not normal' or opposing to how they should ideally feel. Expanding on that, some participants reflected on having incorrectly trivialised or normalised their symptoms before:

"So, you realised, okay, maybe I've been telling myself all this time 'this is okay', but actually it's not at all." (P26, male, 30–39 years, tailored feedback [not remembered])

Furthermore, completing the screening questions was sometimes described as prompting or 'forcing' a way of introspection that participants would not have come up with on their own:

'Because [...] you are sort of [...] stuck with your head in the sand and you don't know where the front and back are. And then there were these very clear, simple questions that no one had asked you before, where you suddenly thought about it in a completely different way.' (P7, female, 30–39 years, no feedback)

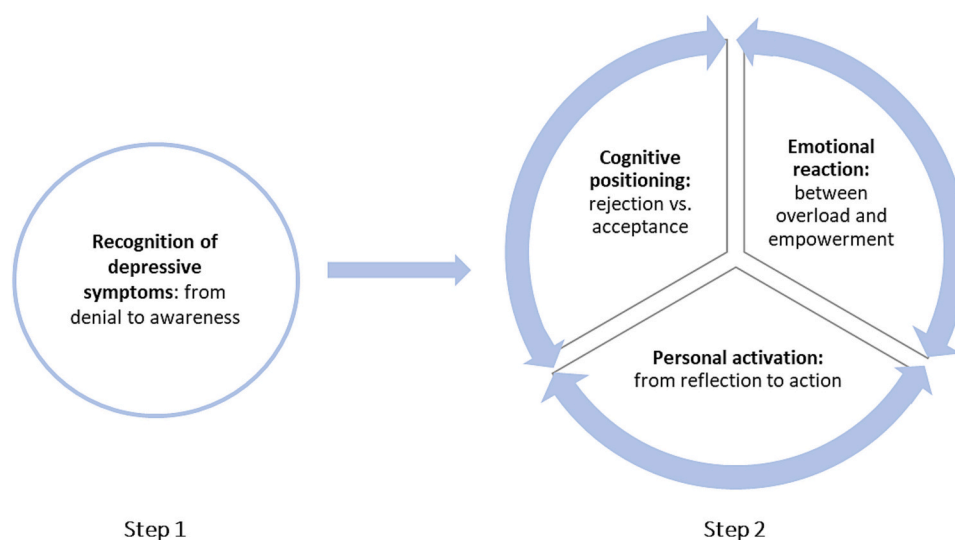


Fig. 1. The experience of online depression screening as a two-step process: Step 1 is the initial reaction to the screening procedure; step 2 describes a subsequent self-explorative process, comprising mutually reinforcing themes.

3.2.2. Cognitive positioning: rejection vs. acceptance

As a response to the screening, many participants reported to have reflected on how to position themselves to a possibly new view of themselves. Most often this referred to the question of whether to reject or accept an illness- or depression-related identity. In that respect, some participants weighed up arguments for and against the possibility of being depressed and remained undecided:

‘Well, of course I was shocked at first, because it really seemed like depression. [...] But I still knew that it wasn't that bad yet, because I wasn't quite as limited in my everyday life as I would be if I had a severe depression or something like that.’ (P10, male, 20–29 years, tailored feedback)

Others rejected an illness-related identity by drawing on an own inner standard, such as a comparison with more severe episodes in the past or the attribution of symptoms on external conditions:

‘So you already have this feeling that this is not your normal state and that it doesn't sound so good. But I would play it down in my head: Well, everyone is feeling a bit like that [during the pandemic], it's normal at this point and it will automatically go away again.’ (P1, female, 20–29 years, standard feedback).

Many of the participants, however, discussed tending to accept a depression-related identity. This acceptance was provoked by both the ‘sum of the screening questions’ and the explicit feedback. In this context, some participants reflected on a prior cognitive incompatibility between their ‘happy’ or ‘strong’ self-image and the possibility of having a depression or ‘being in need’. As they reported, the screening facilitated the integration and acceptance of both. Further, some participants described this acceptance as relieving and helpful:

‘So, for me it just became clear ‘okay, maybe I am that person now’. Before, it was always ‘no, it's definitely not depression, it can't be, I'm always in such a good mood’. But then it was the confirmation ‘no, maybe I'm not in a good mood sometimes, maybe I'm just a bit depressed’. [...] And this self-acceptance, this accepting of the, let me express it as an illness, or of the limitations, has already helped me to ‘find myself again’.’ (P10, male, 20–29 years, tailored feedback)

3.2.3. Emotional reaction: between overload and empowerment

The screening process was often reported to elicit diverse and partly intense emotional reactions. At large, participants experienced ambivalent feelings: a first ‘shock’ or surprise about the realisation of their condition was mostly followed and outweighed by empowering emotions. These included perceptions of ‘not being alone’ or ‘being seen’ through the screening questions, and, most often, a feeling of relief. This relief was mainly related to two aspects: First, some participants reported that having an explanation for their condition opened up ideas of how to improve their situation and inspired confidence and hope. Second, relief was often explicated to relate to a validation of the participants' intuition that their condition is ‘really an illness’ or ‘really severe’. In this context, participants discussed that they had questioned this intuition before because they feared to ‘imagine’ their symptoms or to be to blame for their condition themselves:

‘Well, there was simply this realisation that I'm not imagining it, that I'm not a hypochondriac, but that it's simply real, and that I can work with it. That has already had a positive influence on me.’ (P15, female, 50–65 years, tailored feedback).

Several participants also reported rather challenging emotions. Realising the seriousness of their condition induced for example sadness and self-pity. Further, some participants elaborated on feeling ‘uncomfortable’ or ‘oppressed’ as they regretted ‘not having seen it come’, ‘not

having cared enough for themselves’ or ‘not having taken their condition seriously’:

‘[...] a bit of an oppressive feeling that maybe I played it down before and didn't really deal with it. [...] So to say I acted against my own feelings. Or that I didn't take it so seriously. [...] Um, yes, and at that moment I thought ‘Well, that was actually not so good, not to address it directly, but to always swallow it down. Um, and to stay in the routines of everyday life’. So to say, this functioning in everyday life.’ (P11, female, 20–29 years, tailored feedback)

Beyond that, a small number of participants offered accounts of how the screening questions triggered very intense negative emotions and acute distress, that was accompanied by memories from the past. These participants also reported that the regulation of their negative emotions required time-consuming engagement with self-defined coping activities:

‘So it took quite a while [to get away from the questions]. It wasn't all done straight away with music, but I had to go on the rowing machine for another hour to get myself back on track to some extent.’ (P18, male, 50–65 years, standard feedback [not remembered])

3.2.4. Personal activation: from reflection to action

Both screening questions and feedback were described as a trigger or ‘catalyst’ for a personal activation. This comprised a self-reflective process: participants highlighted that being confronted with the screening questions changed their perspective on themselves and prompted a partly first-time reflection on reasons for their condition. In this context, several participants reported to have come up with psychosocial explanations for their symptoms. As a consequence, they have often questioned their current way of living and dealing with stressors:

‘The questions lead you to ask specifically where you stand and where you want to go [in life]. [And] no matter what the complaints are, especially if they are psychological, they certainly always have a cause. But under normal daily conditions, you very rarely question such things.’ (P12, male, 50–60 years, standard feedback)

Further, participants described engaging in cognitive solution-seeking. Participants receiving only screening questions stated that ‘realising’ their condition enabled them to identify starting points for change, without however naming these. The focus in participants receiving feedback was more normative and specific: realising that their condition was ‘not normal’ prompted internal appeals that they ‘should’ or ‘need to’ change something, such as seeking a health professional:

‘I think that just showed me ‘okay, it's serious’ and not something normal and not something you should ignore. And I also thought about maybe going to therapy again.’ (P13, male, 20–30 years, standard feedback)

Finally, many participants reported to have indeed engaged in active forms of support-seeking. These included self-management activities or self-care (following the screening questions), as well as talking with friends and family or seeking professional help, such as talking to their general practitioner or seeking a psychotherapist (following the feedback):

‘It was definitely good to have [the feedback] in front of my eyes again, somehow, because I think I didn't take my symptoms so seriously at the time, and it was good to see it again in black and white. And I think that was also one of the reasons why I went to therapy again, because then I realised ‘okay, it's not normal after all’.’ (P13, male, 20–29 years, standard feedback)

4. Discussion

Despite growing public use and promotion of online depression screening, current evidence on effects and mechanisms is inconclusive and omits the perspectives of those affected. In this qualitative follow-up study of an RCT on feedback after online depression screening, we aimed to further a comprehensive understanding of online depression screening by exploring how adults with undiagnosed but suspected depressive disorder experience the screening process.

Our results suggest that online depression screening is experienced as a complex two-step process: As a first step, screening prompted the recognition of depressive symptoms by reducing denial and enhancing awareness of symptoms. As a second step, most participants engaged in a self-exploratory process encompassing up to three themes: a cognitive positioning towards a potential illness-identity, emotional reactions between empowerment and overload, and/or a personal activation ranging from self-reflection to action. Importantly, participants did not experience all of the described phenomena in the same way. Rather, the focus, the intensity and the perceived valence of the experiences varied across participants. For most, the screening was experienced in a positive way: it enhanced validation and self-understanding, helped to integrate and accept an illness-related self-identity, and/or enabled solution- and support-seeking. For a minority of participants, on the other hand, the screening process elicited negative emotions and acute distress that was challenging to cope with. Lastly, it should be noted that recognition of symptoms and subsequent self-exploration were reported both by participants who received feedback on their condition and by those who answered only the screening questions.

The findings on both benefits and negative effects of the screening process are consistent with prior qualitative research. In the above mentioned study on online depression screening in young adults, participants also reported ambivalent emotional reactions such as validation and shock, as well as actions to manage symptoms such as seeking support (Kruzan et al., 2022). In studies on paper-pencil- instead of internet-based depression screening in primary care or postnatal settings, participants further highlighted an increased awareness of symptoms and a deeper self-understanding. However, screening was also perceived as a personal intrusion, induced a conflict with the self-image, and elicited a rejection of the 'diagnosis' (Dowrick et al., 2009; Shakespeare et al., 2003; Wittkamp et al., 2008).

Another issue named by participants relates to the denial or normalisation of symptoms. Participants described that by forcing the recognition of symptoms, the screening process helped them to overcome normalisation. This links to findings of a qualitative synthesis which showed that delay before help-seeking in depression is often due to normalisation, denial or avoidance of symptoms (Doblyte and Jimenez-Mejias, 2017). Taken together, these findings suggest that recognising the severity of the condition, as opposed to normalising it, appears to be necessary to induce sufficient motivation for change. As such, the recognition of symptoms might be a crucial mechanism of change in (online) depression screening.

In extension to prior research focusing on the mere description of individuals' experiences, we conceptualised participants' experiences as a process leading towards some form of 'activation'. This understanding may be theoretically corroborated by existing behavioural theories such as the Transtheoretical Model of Behaviour Change (TTM; Prochaska et al., 2015). The TTM characterises behaviour change as a series of stages that at large resemble the steps symptom recognition and self-exploration (including the theme personal activation) found in this study: precontemplation (no awareness of need for change), contemplation (some awareness of need for change), preparation, action (taking steps towards change), and maintenance. The TTM further assumes that individuals can enter at any stage and often progress through stages in a nonlinear manner. These assumptions are likewise compatible with our findings and could provide an approach to explain differences in experiences of screening questions and/or feedback between participants.

4.1. Practical and research implications

Traditionally, (online) depression screening was mainly conceptualised as a pathway towards help-seeking, therefore as 'a means to another end'. However, the current study suggests that for many individuals the screening process has a direct subjective benefit itself. This includes meeting individuals' emotional needs for validation and empowerment, self-reflection and self-understanding, and an adaptive positioning towards an illness-related self-identity. To examine generalisability, there is a need for future quantitative research based on patient-oriented outcome measures, ideally assessed directly after the screening. Furthermore, as participants in this study reported to have benefitted from the screening in different ways, future studies should examine how to match the screening process to the different individuals' needs. In this context, the outlined TTM might be a helpful framework to tailor screening interventions specifically to the stage at which an individual enters the screening process.

Altogether, the current findings regarding subjective benefits of online depression screening can help explain the recent public demand for it. Further, they may inform an early and economic provision of low-threshold support for individuals with undiagnosed but suspected depressive disorder.

Of note, benefits of online depression screening were only reported by a sub-sample of participants. On the contrary, the screening procedure also prompted negative emotions and acute distress, which may be categorised as negative effects. Indeed, the risk of negative effects in (online) depression screening is increasingly discussed (Duckworth and Gilbody, 2017; Ryan and Wilson, 2008; Thombs et al., 2012), but research on this subject remains missing (O'Connor et al., 2023). Qualitative findings related to an online intervention for treating depression, however, show similar results: participants described psychological and physical feelings of discomfort attributed to gaining awareness of their condition, to facing negative memories, or to a perceived lack of (therapist) support (Fenski et al., 2021). These and our findings point to the relevance of better understanding the prevalence and the clinical significance of negative effects in online depression screening and, most importantly, of focusing on how these negative consequences can be mitigated for those affected. This is of particular importance as online depression screening is already widely available.

4.2. Limitations

The results of this study should be interpreted in light of the following limitations. First, the study was announced as a survey on stress and well-being and not explicitly called for those seeking online depression screening. Further, both the RCT sample and the interview subsample were self-selected and educated above average. Thus, individuals who participated in the RCT may differ from those using public online depression tests, and participants interested in this follow-up may have been more positive about the screening process or vice versa. However, as the aim of this study was not representativeness, as maximum variation sampling regarding the pre-defined criteria was achieved, and as data analysis resulted in contradictory perspectives, we consider the collected data sufficient. Second, the interview took place approximately six months after screening. Although initial interview questions aimed at helping to recall the screening situation, it cannot be ruled out that participants' memories of the screening process may have been biased. Third, beyond a substantial overlap of experiences across study arms, findings might also indicate differences in the weighting of the reported themes - with the screening questions tending to be associated more with symptom recognition and the feedback of results more with self-exploration. Unfortunately, the design of this study does not allow for drawing valid conclusions on differential effects. For the same reason, possible relationships between mentioned themes and a previous depression diagnosis, that was present in almost half of the participants, could not be examined. Fourth, the sample was recruited from an

RCT. In contrast to public screening practice, participants were paid more attention by repeated surveys and interviews on their mental health, which might have biased their memory of the screening process. Further, the RCT was conducted partly during the COVID-19 pandemic. Although only a minority of participants elaborated on this in their interviews, this might have influenced the participants' clinical characteristics as well as reported experiences. Lastly, online depression screening and feedback were provided in a particular format, so results might not generalise across other public depression screening. It will be important for future work to examine if the pattern of experiencing online depression screening found in this study can be corroborated in naturalistic settings.

4.3. Conclusion

This study furthers a comprehensive understanding of online depression screening. It outlines that screening with and without feedback of results can be experienced as complex two-step process promoting the recognition of depressive symptoms and a subsequent self-exploration. While few participants reported negative effects, the majority described the screening process as insightful, empowering, and activating. Further research should determine to what extent online depression screening may be used as a standalone form of low-threshold support for individuals with undiagnosed depressive disorders, while focusing as well more on potential negative effects.

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Compliance with ethical standards

The underlying DISCOVER RCT was approved by the Ethics Committee of the Hamburg Medical Association in July 2019 (reference: PV7039); the present trial was approved by the Ethics Committee of the University Medical Center in June 2021 (reference: 0337).

CRedit authorship contribution statement

SK and BL obtained funding for the underlying RCT (DISCOVER). FS and SK developed the study concept and were engaged in data analysis (re-coding, theme development and theme naming). FS led data collection and analysis and wrote the first draft of the manuscript. SK and BL critically revised the draft for important intellectual content. All authors gave approval of the version published.

Declaration of competing interest

The authors declare that they have no competing interests.

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