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# EATING DISORDERS

## **People's Experiences of Computer-Based and Conventional Self-Help Interventions for Eating Disorders: A systematic Review and Meta-Synthesis of Qualitative Research**

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**Experiences of Computer-Based and Conventional Self-Help Interventions for Eating Disorders:  
A Systematic Review and Meta-Synthesis of Qualitative Research**

**(4670 words)**

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## **Abstract**

**Objective:** Self-help interventions have been demonstrated to be effective in treating bulimic-type eating disorders (EDs). In particular, computer-based interventions have received increasing attention due to their potential to reach a wider population. This systematic review aimed to synthesize findings from qualitative studies on users' experiences of self-help interventions for EDs and to develop an exploratory framework.

**Method:** A systematic review and meta-synthesis on seven peer-reviewed qualitative studies on structured computer and book-based self-help interventions for EDs was conducted using Noblit and Hare's (1988) 7-phase meta-ethnography. Four of the selected studies investigated computer-based self-help programmes, and three of the studies investigated book-based guided self-help programmes.

**Results:** Six concepts were synthesized. They included intervention-related factors (anonymity and privacy; accessibility and flexibility; guidance) and user-related factors (agency/autonomy; self-motivation; and expectations/attitudes). The study revealed the "machine-like" and relational properties of the computer; the expansion of treatment time and space in psychological interventions, the changing role of the medical health professional from a "therapist" to a "guide", and a change from understanding interventions as a conclusive treatment plan to a starting point or stepping stone towards recovery.

**Discussion:** Computer-based self-help interventions should take advantage of the "machine-like" properties of a computer (neutrality, availability etc.) as well as its ability to facilitate human interactions. Users should also be facilitated to have a realistic understanding of the purpose of self-

help interventions and the place of self-help interventions in their broader treatment plans to moderate expectations and attitudes.

For Review Only

## **Experiences of Computer-Based and Conventional Self-Help Interventions for Eating Disorders: A Systematic Review and Meta-Synthesis of Qualitative Research**

Self-help interventions are structured stand-alone treatment programmes, based on a clear psychological model and delivered to the user with little or no involvement from a health professional (Lewis et al., 2002). There has been growing interest in self-help interventions for eating disorders (EDs), as currently, many people with EDs do not receive treatment for their disorder (Kazdin, Fitzsimmons-Craft, & Wilfley, 2017; Moessner & Bauer, 2017). Self-help interventions can reduce barriers to accessing care for people with EDs (Aardoom, Dingemans, & Van Furth, 2016; Hart, Granillo, Jorm, & Paxton, 2011) and are less costly than face-to-face psychological therapy (Wilson & Zandberg, 2012). In the UK, guided self-help (GSH) interventions are the first step in treatment of bulimia nervosa (BN) and binge eating disorder (BED) (National Institute of Health and Care Excellence, 2017).

Whilst conventional (book-based) self-help interventions have been used for many years, the scalability (Fairburn & Murphy, 2015), interactivity and accessibility (Yim & Schmidt, 2019) of digital self-help interventions, have made them increasingly attractive to practitioners, researchers and policy makers alike.

There is evidence which supports the efficacy and effectiveness of online guided self-help interventions for EDs (for review see Schlegl, Burger, Schmidt, Herbst, and Voderholzer (2015)), but the impact of these interventions on ED psychopathology and behaviours is highly variable (see Beintner, Jacobi, and Schmidt (2014); Loucas et al. (2014); Traviss-Turner, West, and Hill (2017)). A key issue which affects clinical outcomes is that treatment uptake and completion rates vary widely across trials, and are often suboptimal (e.g. drop-out rates range from 1-88% (Beintner et al., 2014)). As a result, there has been a growing interest in taking individuals' needs, preferences and experiences into account in the design, development and delivery of technology-based interventions.

Qualitative studies offer insight into the attitudes, views and experiences of those who use such interventions, and may help to identify factors that are critical to intervention acceptability, outcome or engagement.

Synthesizing findings from qualitative studies allows a more in-depth understanding of the textual and rich data, and for identifying overarching themes. Such meta-syntheses can contribute to knowledge about clinical interventions by helping to define or refine research questions, as well as supplementing evidence on efficacy or effectiveness (Ring, Jepson, & Ritchie, 2011). A widely-adopted methodology for qualitative evidence synthesis is meta-ethnography (France et al. (2019)). This methodology has been applied previously to GSH interventions across a range of mental health conditions (Khan, Bower, & Rogers, 2007; Knowles et al., 2014). Britten et al. (2002) argue that such syntheses go beyond traditional narrative reviews. Through the use of induction and reinterpretation, novel interpretations and concepts can be generated. For example, Khan et al. (2007) in a meta-synthesis of nine papers on people's experiences of depression management in primary care identified new themes that allowed them to develop an exploratory framework for the design and development of a GSH intervention for depression. A meta-synthesis of eight studies on computerised therapy for depression and anxiety (Knowles et al., 2014) identified two core constructs, namely the need for computerised therapies to be tailored to the individual and the dialectical nature of perceived benefits and limitations of such interventions. This led these authors to develop a model that could reconcile apparently contradictory positives and negatives regarding users' experiences of computerised therapy. Based on this, they recommended that future studies should exploit the potential of modern technology to 'foster a sense of collaboration and connection, with peers, professionals or computer agents, in order to improve engagement with computerised therapy'.

To date there have not been any qualitative syntheses on self-help interventions for EDs. Given the increasing prominence of self-help interventions for EDs, we believe that a review of qualitative

findings in individuals' experiences of such interventions is timely and will complement quantitative findings.

The present systematic review uses meta-ethnography to identify and synthesize qualitative studies of users' experiences of computer and book-based self-help interventions for EDs, and seeks to develop an exploratory framework which can be applied to the development and improvement of computer-based interventions for EDs. Meta-ethnography was chosen as the methodology for two reasons, firstly, to be in line with qualitative meta-syntheses on self-help interventions in other conditions (e.g. Khan et al. (2007); Knowles et al. (2014)) and secondly, because of its relevance to studies on people's experience of illness and care (Atkins et al., 2008).

## **Method**

The review followed eMERGe guidance for reporting meta-ethnography (France et al., 2019).

### **Literature Identification**

This review examines qualitative studies on participants' experiences of self-help interventions for EDs. The literature search focused on three areas: search terms in relation to (1) EDs, (2) self-help interventions, and (3) qualitative methodology. First, we conducted a broad search for all self-help interventions ranging from book-based (bibliotherapy) to computer-based interventions, as well as guided and non-guided interventions. Second, to ensure computer-based self-help interventions were included in the synthesis, we conducted another specific search including search terms related to technology-based interventions. Table 1 lists the search terms, which were informed by those used in previous meta-syntheses (Khan et al., 2007; Knowles et al., 2014) and a recent systematic review (Traviss-Turner et al., 2017).

See Heng Yim (SHY) conducted the search and retrievals with supervision from the second author Ulrike Schmidt (US). Four health science databases were searched during December 2018 and updated in January 2019: Embase (1974-), Ovid MEDLINE (1946-), PsycINFO (1806-), and the



Cochrane library. In addition to database searches, citation searches were also used. Duplicate papers were removed before screening. The PRISMA diagram is presented in Figure 1 (Moher, Liberati, Tetzlaff, & Altman, 2009).

### **Inclusion and Exclusion Criteria**

Identified studies were evaluated against the following inclusion and exclusion criteria listed in Table 2.

### **Critical Appraisal**

The requirement for quality appraisals of the underlying studies when conducting qualitative reviews is a subject of debate. The meta-synthesis performed by Knowles et al. (2014) did not involve a quality assessment of primary studies using a formal appraisal tool. These authors argued that data richness and thickness is more important in than the scientific rigour of included studies in a qualitative synthesis. In contrast, recent Cochrane guidance on conducting qualitative reviews considers such assessment essential to evaluating the impact of the methodological limitations of primary studies that contribute to the synthesized findings (Noyes et al., 2018).

We used the Critical Appraisal Skills Programme tool (CASP) (<https://casp-uk.net/>) to assess the quality of identified studies. The CASP is one of several tools recommended in the Cochrane Handbook (Hannes, 2011), for appraisal of qualitative studies. We used the outcome ratings from Cesario, Morin, and Santa-Donato (2002), in which each of the ten criteria in the CASP tool was given a score from 0-3, with 0 point being not applied or not reported, and 3 points being well-addressed, i.e. maximum score = 30. The critical appraisal was conducted by author SHY, in discussion with the second author US when uncertainties arose. No studies were excluded on the grounds of poor quality.

### **Meta-ethnography and Meta-synthesis**

Meta-ethnography is an increasingly influential, theory-based, interpretative qualitative methodology, widely used in health and social care research. By producing novel interpretations that go beyond individual study findings, high quality meta-ethnographies can generate new hypotheses, advance conceptual understanding of health care issues and inform clinical practice, research and guidelines (France et al., 2019). We followed the 7-phase approach of meta-ethnography reported in seminal papers such as Noblit and Hare (1988) and Britten et al. (2002) presented in Table 3.

### **Reflexivity of the study team**

Using the definition of reflexivity by Cohen and Crabtree (2006) detailed in Table 3 when appraising identified studies, we carefully considered our own backgrounds and biases when conducting the meta-ethnography. We have a psychology/psychiatry and clinical background rather than a computer science background. We have expertise in the development and evaluation of computerised and book-based self-help interventions, in supporting and guiding such interventions and in the conduct of qualitative studies in this area. We made every attempt to reduce the potential for biased interpretation by paying attention to the full range of findings and interpretations.

## **Results**

### **Study Details**

Table 4 summarises the study details. No study used unguided self-help. We identified seven studies which explored GSH interventions for EDs in clinic or community settings. Three assessed participants' experiences of the same computer-based intervention, 'Overcoming Bulimia Online' (Williams, Aubin, Cottrell, & Harkin, 1998), albeit in different populations and settings (children & adolescents: Pretorius et al. (2009), university students: Sanchez-Ortiz et al. (2011), community participants: McClay, Waters, McHale, Schmidt, and Williams (2013)) in the UK. A fourth paper explored a different online programme with participants from Australia and Hong-Kong (Leung, Ma,

and Russell (2012)). The two studies on book-based GSH programmes were from the UK. One of these involved a series of interviews with service users and intervention guides (Traviss, Heywood-Everett, & Hill, 2013). The final study explored the use of GSH with Mexican Americans, with the view of adapting an existing programme to their cultural needs (Shea, Cachelin, Gutierrez, Wang, & Phimphasone, 2016). All study interventions were based on principles of Cognitive Behavioural Therapy (CBT) or Motivational Interviewing.

The quality of the identified studies was moderate to high with scores ranging from 21-25. Reflexivity statements were lacking in five papers. Hence, it was difficult to elucidate the extent to which the authors' interpretations were informed by their epistemological positions or backgrounds.

### **Study Synthesis**

Table 5 summarises the themes identified across studies. Table 6 shows the main concepts in the form of first, second and third-order constructs.

The synthesized concepts were largely reciprocal (i.e. Consistent concepts). They are classified here as intervention-related and user-related factors.

### **Intervention-related factors**

#### *Anonymity and privacy*

In computer-based interventions, anonymity was seen as helpful given that many participants struggled with overcoming internalised shame, self-stigmatisation and secrecy about their EDs.

This was felt to be related to negative public perceptions of EDs with binge eating, as reflected in one participant's comment that people with bulimia nervosa are seen as "failed anorexics".

Participants recognised secrecy as a factor which perpetuated their problems, "there's something about you know it being hidden and awful that it's not helpful isn't it...It just feeds itself" (McClay et al., 2013). Participants in the same study acknowledged the use of the self-help intervention helped them be more open about their ED. The high degree of anonymity may be a unique advantage of

computer-based GSH when compared with bibliotherapy, as for example, a participant noted feeling “embarrassed to pick up self-help books in the library” (McClay et al., 2013). One exception was found in Shea et al. (2016), who evaluated a face-to-face book-based self-help programme. Participants in that study stated that they preferred to include their family members in their recovery process and meet other participants face to face for support. This may reflect a culture-specific factor i.e. that Mexican Americans are a highly family-oriented culture.

Nevertheless, it should be noted that a computer-based programme does not guarantee a high degree of privacy. Both Pretorius et al. (2009) and Sanchez-Ortiz et al. (2011) mentioned that participants worried about being noticed by others when using the self-help programme in a public setting, as the programme title “Overcoming Bulimia” was prominent on the computer screen.

This theme was not identified in the papers on bibliotherapy, which was expected as those interventions involved face-to-face contact between the users and their guides.

#### *Accessibility and flexibility*

GSH, especially computer-based GSH, was seen as accessible and flexible, in that users could access the intervention anytime and anywhere. First-order and second-order constructs could be further conceptualised into two ways – (1) GSH being an intrinsically better option than face-to-face therapy, or alternatively (2) GSH being seen as second-best, as other options were not readily available. For the first conceptualisation, examples include “...it’s much easier just to do it at home.” (Pretorius et al., 2009), or “you didn’t have to sit there with a patronising (pause) um person, being judged every week on whether you follow what she actually said to you or not” (McClay et al., 2013). In the second conceptualisation, despite accessibility and flexibility being noted as advantages, they were not the main reasons that attracted the participants. GSH as a “second-best” option was noted in several papers (e.g. McClay et al. (2013); Plateau, Brookes, and Pugh (2018)), such as “there isn’t much help out there...a long waiting list...” (McClay et al., 2013).

### *Guidance*

All studies emphasised the helpfulness of guidance during the self-help programme. Participants consistently mentioned that they “would not have been able to do it without guidance” (Traviss et al., 2013), or “what was most helpful was receiving emails and feedback” (Leung et al., 2012). It was felt that guidance could help with maintaining motivation – “you’ve still got that person in the background who’s wanting to know, wanting to know what’s happening so that’s motivation” (McClay et al., 2013).

In terms of qualities of a guide, being “non-judgmental” was widely mentioned. Other identified qualities included being patient and honest (Plateau et al., 2018), as well as respectful, flexible, responsive, and taking on the role of a “facilitator” rather than a “therapist” (Traviss et al., 2013).

### **User-related factors**

#### *Agency/ autonomy*

Across studies, participants consistently mentioned the role of “self” in taking charge of their recovery, such as “taking ownership of this [programme]” (Shea et al., 2016). For example, in the study by Traviss et al. (2013) where some self-help guides were interviewed, one of them observed that participants with more positive outcomes were those who were “willing to take more responsibility”. Leung et al. (2012) also included ideas about “taking control” instead of “letting ED control you”, and “...[the programme] makes me more determined to fix myself”. It is clear that engagement with the programme was seen as being effortful. As illustrated by Plateau et al. (2018), participants used words such as “allow”, “try”, “have to” to describe the process. In this respect, computer-based GSH was seen as more effective than book-based GSH because it did not allow unstructured browsing (Sanchez-Ortiz et al. (2011)): “it took you through step by step... the computer can do much more than a book... you just skip through [in a book] whereas if it’s on the

computer you have to go step by step and then you can't move on until you've thought about it and done it so that, I think was a lot more effective".

### *Self-motivation*

Across the computer-based GSH studies, despite therapist guidance being provided online, participants' motivation fluctuated, and was influenced by factors such as tiredness or stress, making it hard for them to follow through with the programme. A participant from Pretorius et al. (2009) found motivation a "major problem" as "there's no one really to disappoint". This suggests that online guidance was perceived as being distant. In contrast, similar issues with self-motivation were not mentioned in any of the three book-based self-help studies, perhaps because guidance was delivered face-to-face and participants may therefore have felt more accountable to someone.

### *Expectations/ attitudes*

Participants were initially often sceptical about GSH as shown particularly in McClay et al. (2013) and Plateau et al. (2018), but were willing to 'give this a go' as other options were not available or had been exhausted (McClay et al., 2013; Pretorius et al., 2009). Traviss et al. (2013) particularly looked at "what works for whom". The guides interviewed mentioned those with more positive treatment outcomes were "more realistic" or had "no expectation" towards the intervention outcome, or towards the extent the guides contributed. Others who viewed computer-based GSH positively saw the intervention as a "stepping stone" (Pretorius et al., 2009), or a "step towards recovery" (Sanchez-Ortiz et al., 2011). These ideas were not present in Shea et al., (2016).

## **Line of argument synthesis**

### *Computer as a machine and its relational properties*

Distinct from bibliotherapy, across the computer-based GSH studies, participants seemed to value the "machine-like" characteristics of the intervention, which were equated with the computer being non-judgmental and providing a neutral therapeutic space – "the computer isn't gonna judge you"

(Sanchez-Ortiz et al., 2011), and “I didn’t have to worry about what anyone thought of me or anything, just me and the computer” (Pretorius et al., 2009). Conversely, people expressed a fear of being judged in face-to-face encounters (McClay et al., 2013) and listed being non-judgemental as a key characteristic for a good human guide. However, despite valuing the neutrality of the computer, participants also demonstrated a need for human warmth: “a computer doesn’t have emotions...you can’t express any feelings to it” (Pretorius et al., 2009). In addition, people expressed a need to relate to others who knew about their problems and progress. This was evidenced by the language participants used, such as the “person in the background wanting to know what’s happening” (McClay et al., 2013), and “what was most helpful was receiving the emails and feedback, knowing that there was someone out in cyberspace listening to me and offering support” (Leung et al., 2012). In this context, perhaps the computer could be conceptualised as a “social” agent – having a relational, interpersonal function, mediating and connecting the person with ED with their online coach, whilst maintaining a neutral zone to explore difficult issues, buffering against judgment from others. By preserving anonymity and privacy, computer-based interventions enabled participants to gradually open up and overcome their secrecy. This was valued by people who experience bulimic symptoms, given the internalised shame and self-stigmatisation often associated with their ED.

### *Changing functions of “psychological interventions”*

The elicited themes, especially those from studies on computer-based interventions, revealed a changing landscape of psychological interventions.

#### *(1) Changing expectations*

Self-help intervention sessions are more fluid, flexible and accessible than conventional therapy. They do not need to happen on a fixed day/time and can be of variable duration. As a consequence, the individual has more agency over the pace of the intervention. This in turn places more “responsibility” onto the individual. Expectations also need to be adjusted as the “guide” is no longer the “therapist” in the traditional sense (see point (2) below). With

these factors in mind, the expectations of the intervention outcome may need to be adjusted in relation to face-to-face psychological therapies. In particular, participants using computer-based self-help interventions viewed this as a first step or a stepping stone towards their recovery. However, this puts a strong onus on the individual's motivation, thus some structure and guidance to build and nurture this are needed.

### *(2) Changing role of the "professional"*

With self-help interventions, the power dynamic between the professional and the user is no longer as unequal as in conventional therapy. In GSH the traditional "therapist" takes on the role of a "guide" or "facilitator". This was extensively discussed in Traviss et al. (2013), where some guides considered participants having control of the self-help materials paramount in the process. However, some key qualities and skills, such as having a respectful and non-judgmental attitude were needed. The guides were required to tailor materials to the needs of the participants, provide the participants with feedback and encouragement, as well as ask them probing questions at appropriate junctures.

### *(3) Changing therapeutic time and space*

The flexibility and accessibility of the self-help interventions has led to an expansion of what can be called therapeutic time and space. Users are no longer confined to a fixed time and space when receiving help for their EDs. Self-help manuals can be read at home or on-the-go, and individuals can access computer-based programmes with any digital device. A participant mentioned, "it was good because it was convenient so... you could fit it into, the rest of your life" (McClay et al., 2013). Additionally, ownership of the process was seen to encourage continuity of care for oneself even after participants had completed the programmes. For example, in a study on bibliotherapy, a participant described, "it's not like it's finished, technically you've still got the book there to help" (Plateau et al., 2018). With



suitable cultural adaptations, participants in self-help programmes can also form a base from which a supportive community can be built, where participants who have been through the programme continue to support one another (Shea et al., 2016).

## Discussion

The synthesis yielded six concepts in relation to users' experiences of self-help for EDs. We identified (1) anonymity and privacy (2) accessibility and flexibility, and (3) guidance as intervention-related factors and (4) agency/ autonomy, (5) self-motivation, and (6) expectations/attitudes as user-related factors. When developing a line of argument, we identified the computer as a machine with relational properties. We saw the changing functions of this form of psychological intervention, with a less-boundaried therapeutic time and space, a changing role of the professional from "therapist" to a "guide", and changing expectations of the outcome of such interventions, i.e. full recovery is typically not thought to be achieved by completing a self-help intervention. Such interventions are either seen as a starting point or stepping stone, or an alternative after other options are exhausted instead of fully replacing traditional psychotherapies.

The positive perceptions of the "machine-like" characteristics of computer-based interventions demonstrate that there are unique advantages to computer-based self-help interventions. These advantages contrast with some unfavourable aspects of face-to-face therapy. In contrast, certain positive aspects of conventional therapy can be augmented when delivered by a computer. This account echoes with Farzanfar (2006) who warned against "anthropomorphising" (technology mimicking a human agent) computers in self-help interventions. It was suggested that instead of fully embodying human characteristics, some intrinsic properties of computers should be kept. According to these authors (Farzanfar, 2006; Farzanfar, Frishkopf, Friedman, & Ludena, 2007), users may prefer the computer to be less expressive and exhibit more "machine-like" behaviours. The perceived neutrality and distance between the computer and the user supports the need for a non-judgmental environment which may be particularly pertinent in EDs, given high levels of self-

criticism, shame, guilt and embarrassment found (Frank, 1991), as well as potentially negative experiences from past help-seeking attempts. Another unique merit of such interventions is the re-configuration of treatment time and space, a concept also identified in an earlier meta-synthesis on digitisation and healthcare infrastructure (Andreassen, Dyb, May, Pope, & Warth, 2018). These authors described how through e-health, there is a transferral of clinical spaces into domestic spaces. This could be problematic, especially as this change could make their mental health difficulty more pronounced at home (Andreassen et al., 2018). For example, in the ED context, the concept of “home” becoming a clinical space is potentially complex, as struggles with food often occur in domestic spaces, such as kitchens and bedrooms. However, in practice this theme was not identified in our review. On the contrary, users seemed to value the flexibility and autonomy of the interventions.

The increased fluidity of the therapeutic space and time and the increase in user autonomy and flexibility necessitates greater user motivation. This is especially important in treatments of EDs because of the ego-syntonic nature of EDs, which tends to lower their motivations for working on change (Polivy & Herman, 2002).

Human support remains critical in maintaining motivation and assuring improved outcomes. This is reflected in the crucial role of guidance as identified by users. This complements quantitative research that has demonstrated the effect of guidance on self-help intervention outcomes in ED (Beintner et al., 2014) and other disorders (e.g. Baumeister et al., 2014). Nevertheless, the role of the guide seems to be different from that of the therapist in face-to-face therapy. The value of the guide was perceived to lie in their human qualities, i.e. being responsive and non-judgmental, rather than in their professional expertise. Of note, across studies a range of guides were used from non-specialist to specialist ED clinicians and trained psychotherapists. Our findings echo those of Knowles et al. (2014) meta-synthesis, which also found these common therapeutic factors to be valued qualities in self-help guides. In contrast, a systematic review on guided self-help for EDs showed that

specialist expertise of self-help guides was a moderator of outcome (Beintner et al., 2014), thus the lack of emphasis of study participants on specialist skills of their guides is curious. It is possible that they did not have a reference point for judging the technical skills of the guide or that they implicitly assumed the technical expertise of their guides.

### **Limitations**

This is the first review of its kind in relation to self-help interventions for EDs and its strength lies in its success in identifying novel concepts relevant to self-help ED interventions that were not explicitly synthesized in the existing literature. Key limitations of our review lie in the limited number of programmes studied and the fact that study participants who were willing to give qualitative feedback may not have been representative of the wider group of intervention users, as many of them were intervention completers or those who had positive treatment outcomes. Moreover, only female participants were included. We carefully included the contexts (i.e. settings, participants etc) in Table 4 and we are cautious that the findings may not be transferable to mobile-based or non-CBT-based self-help interventions. A further limitation of this paper was that only one researcher conducted the screening and analysis process. However, the authors discussed a subset of papers and this stimulated new ideas and reflections.

### **Recommendations and Conclusion**

This meta-synthesis captures nuances that may not be identified in quantitative systematic reviews. The findings indicate that issues around privacy, autonomy and empowerment in computer-based and other self-help interventions are complex. Privacy is not always guaranteed in the existing interventions. Interventions need to be designed with the modern user in mind, who may want to use the interventions 'on the go' or in public spaces. The interfaces should thus be designed to be sensitive to the need to protect users from 'prying eyes', such as by keeping in mind how disorder-related terms are displayed on the screen. Further qualitative studies may explore self-help interventions supported by other digital tools, such as smartphone apps, or e-learning courses.

Future work is recommended to further elucidate whether the digital approach is suitable for people with different characteristics (e.g. age, prior treatment experiences, severity/ type of ED).

Development of computer-based self-help interventions needs to exploit their flexibility and harness the inherent “machine-like” properties of the computer, rather than seeking to replicate face-to-face therapy. Our findings show that human support cannot be fully replaced. However, we are not sure how the therapeutic relationship between the user and the guide is augmented by interacting with the programme elements, as some features that strengthen therapeutic alliance are embedded in the design of the programme. Recent research explored the triadic relationship between computerised CBT for mood and anxiety disorders, the human guide and the user (Cavanagh, Herbeck Belnap, Rothenberger, Abebe, & Rollman, 2018). The researchers suggested that the user-provider and user-programme alliance ratings might contribute independently and additively to engagement and outcome. Further research on ED interventions should seek to understand how computer-mediated communication differs from that of face to face therapy in the absence of non-verbal cues, as well as the role of the programme itself on therapeutic alliance.

To enhance users’ levels of interest and motivation, the design of future interventions could incorporate game design elements, such as rewards, challenges or levels. A systematic review by Johnson et al. (2016) assessed the effects of gamification on health and wellbeing domains and found that rewards were the most widely used game design element in behaviour change interventions. Other factors that might impact uptake and outcome of such interventions include the users’ expectations of the self-help programme. When offering such interventions, clinicians should seek to understand and where necessary moderate users’ expectations (e.g. by being aware that users may see GSH as “second-best”), as well as explaining the role of the guide in the process. For example, they might want to discuss patterns of intervention use and anticipate barriers. This may also mean that GSH may be best used in the stepped-care model as an early intervention or after-care tool. Depending on the individual’s routine, it may be best to engage with the programme

flexibly, or to have a protected, structured time when seeking how to integrate the programme into their daily life.

In conclusion, whilst there is still much to learn about the computer-user interface in relation to self-help interventions for EDs, the current meta-synthesis provides a number of pointers for future studies and how to use these interventions in clinical practice.

### **Conflicts of interest**

US is a co-author of three of the papers included in the synthesis. She has developed book-based and online self-help programmes for eating disorders.

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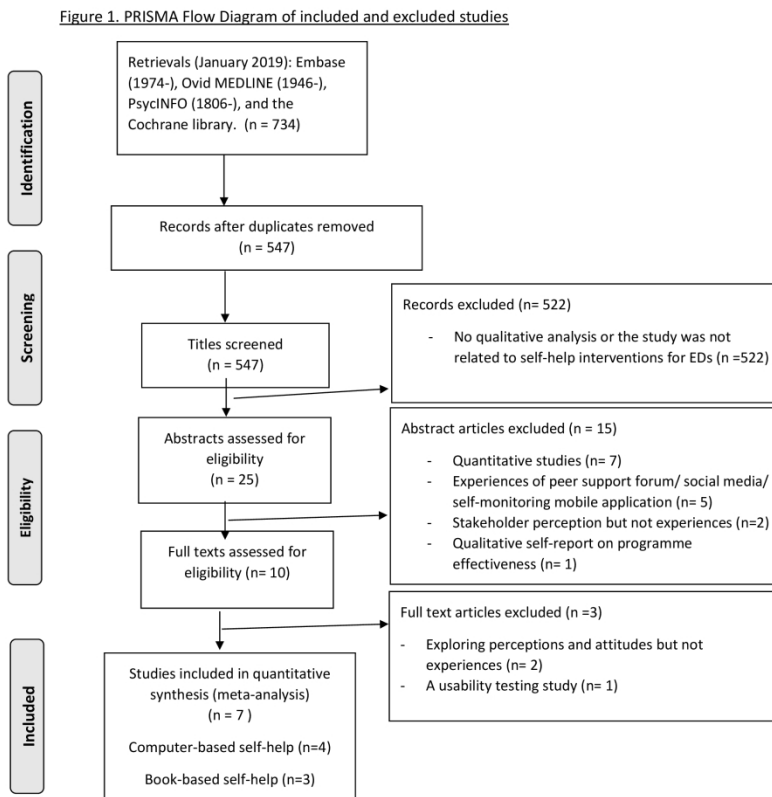


Figure 1. PRISMA diagram of included and excluded studies.

210x297mm (300 x 300 DPI)

## Appendices

Table 1. Search terms

Setting	Intervention	Social Science Methods
Exp "Feeding and Eating Disorders" OR binge eating* OR bulimia* OR ednos OR pica OR purge	self help OR self manage* OR CBT* or self car*  (internet OR online OR web OR tech* OR tele* OR assist* OR Internet therap* OR ehealth OR computeris/zed therap*)	Qualitative OR interview* OR focus group OR thematic analysis OR grounded theory OR semi structured

Table 2. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Original peer reviewed journal articles in English	Questionnaire data with open response text only
Studies on children and adults with any ED	Teletherapy (i.e. person-to-person therapy delivered by phone or video conferencing), technology used to support person to person therapy such as app-based food or mood diaries, peer support fora, or psychoeducational websites
Interventions designed specifically for any ED	
Interventions involving a structured self-help programme based on psychological principles, delivered with the use of technology or through a book/manual	
Details of the qualitative methodology and analysis utilised (e.g. the use of semi-structured interview/ focus groups with qualitative analyses such as thematic analysis)	

Note: ED = eating disorder

Table 3. The 7-phase approach of meta-ethnography.

Phases	Explanation
<i>Phases 1 and 2:</i> Formulating the research question and identifying and selecting relevant studies.	Details on this are given above and in Table 1 and Figure 1.
<i>Phase 3:</i> Reading the Studies	This included extracting descriptive information on study settings, participant numbers, socio-demographics and clinical details, type of interventions, as well as information on data collection, analysis methods and study quality. As part of the assessment of study quality, we assessed the authors' awareness of and inclusion of reflexivity when conducting and analysing the research findings. Reflexivity can be defined as 'an attitude of attending systematically to the context of knowledge construction, especially to the effect of the researcher, at every step of the research process' (Cohen & Crabtree, 2006).
<i>Phase 4:</i> Determining how the studies were to be related	We categorised levels of data into first order, second order, and third order constructs (Schütz, 1962). First order constructs present participants' views, interpretations and understandings in their own words. Second order constructs present the study authors'

	<p>interpretations of the first order constructs.</p> <p>Third order constructs are the synthesis of both first and second order constructs, with the aim of developing new concepts, models or theories about given phenomena (see Phase 5 and 6).</p> <p>After summarising the themes identified by the authors across all studies, we then considered relationships between the concepts from each paper. In this context, a concept is defined as a meaningful idea that has explanatory rather than merely descriptive power (Toye et al., 2013).</p>
<p><i>Phase 5 and 6:</i> Translating studies into one another and synthesising translations</p>	<p>Translation is a process in which concepts in one account are compared constantly and iteratively with those in others. All studies were translated in clusters according to the medium of delivery (computer or book-based) of the self-help intervention. Within each cluster, studies were translated chronologically. SHY compared themes and concepts between different studies and started developing third-order constructs using concept maps and tables. Similarities and differences were highlighted in order to develop further conceptual categories. Potential alternative</p>

	<p>interpretations were discussed amongst the authors (SHY and US).</p> <p>The concepts informed the type of possible synthesis: “reciprocal” – for consistent concepts, or “refutational” – for exploring and explaining contradictions between primary studies, from which a “line of argument”(LOA) was constructed (Britten et al., 2002). This involved building a picture of the whole from the constituent studies. Our intention was to develop a LOA that explored the experiences of self-help interventions for people with EDs.</p>
<p><i>Phase 7: Expressing the synthesis</i></p>	<p>Findings were described and compared to existing literature. Strengths, limitations and recommendations were discussed in the context of how these findings could be utilised by academics, practitioners and policy makers who make use of digital interventions for EDs.</p>

Note: ED = eating disorder



Table 4. Details on study participants, interventions, data analysis and study quality.

	Self-help programme / Context	Country or Region	Aim	Type of ED	Participant characteristics	Intervention delivery	Data Collection Method	Analysis method	CASP score
Computer-based									
Pretorius et al., 2009	Overcoming bulimia online (adolescents) / Part of an accessibility and feasibility study from clinic and community	UK	To investigate young people’s perceptions of a web-based cognitive behavioural intervention for BN	BN, EDNOS-BN	N=11, female, aged 16-20	Web-based 8-session programme, weekly email guidance from either specialist CBT therapists from ED clinics or trained staff member in an ED charity who	Purposive sampling according to age and intervention usage/ semi-structured telephone interview	Interpretative phenomenological analysis	22  Reflexivity not discussed

						provides helpline support			
Sanchez-Ortiz et al., 2011	Overcoming bulimia online / Part of an RCT in university students	UK	To understand participants' views and experiences of iCBT	BN or EDNOS-BN	N= 9, student, female, 5 British and 4 international students, mean age was 23.2	Web-based 8 session programme guided weekly via email by CBT therapists with ED experience	Purposive sampling of those who completed at least half of the programme / semi-structured interview and questionnaire	Thematic analysis	24  Reflexivity not discussed

Leung et al., 2012	Smart eating / Part of an open label trial from clinic and community sample	Australia, Hong Kong	To explore participants' views on how the intervention facilitated their recovery	Any ED	N= 12, female aged between 27-47, 8 Australian, 3 Chinese and 1 Lebanese	Web-based programme with 11 worksheets, health assessments, motivational enhancement strategies, some people used as a stand-alone intervention and others used as an adjunct to conventional treatment, brief feedback	Purposive sampling of those who completed most/ all the programme / structured telephone interview, monthly feedback email from the study researcher who had	Conventional content analysis	21  Reflexivity not discussed
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						provided via email by a researcher with a background in mental health nursing	mental health nursing experience		
McClay et al., 2013	Overcoming bulimia online/ Part of an RCT in a community sample	UK	To examine reasons for choosing the self-help approach, compare attitudes towards cCBT with other treatments	BN, EDNOS-BN	N=8, female, mean age was 33.9	Web-based 8 session programme, guided weekly via telephone, text or email from a non-specialised research assistant with experience of	Purposive sampling according to their intervention usage/ semi- structured interview	Thematic analysis	23  Reflexivity not discussed

			accessed in the past, determine participants' attitudes towards taking part in online research			working in the area of ED and guided CBT research			
Book-based/ bibliotherapy									
Traviss et al., 2013	Working to Overcome Eating Difficulties/ Part of an	UK	To explore how guidance contribute to outcome of self-help, to determine for	All EDs, participants had BN, BED, EDNOs	N= 12, 7 were participants and 5 were guides, female, British	Self-help book, guidance from non-specialist (graduate mental health worker, counsellor or a	Purposive sampling. The clients no longer fit the diagnostic	Thematic framework analysis	25  Reflexivity discussed.

	RCT from clinic sample		whom such interventions are most suitable and beneficial (understanding the process of change)		Caucasian, mean age 46.6	psychotherapist) over 12 weeks over the phone or email	category at 6-month follow-up, the guides had at least 1 client completing and dropping out of the intervention / semi-structured interview		
Shea et al., 2016	Overcoming Binge eating/	US	To discuss participants'	BN, BED, or EDNOS	N= 12, female, mean age	8 brief telephone guidance sessions	Did not specify	Grounded theory	24

	Part of a feasibility trial from a community sample		responses to the culturally adapted cognitive behaviour guided-self-help programme	with binge eating	30.82, Mexican American	(25 min) over 12 weeks (4 weekly sessions and bi-weekly thereafter) from non-specialist postgraduate psychology students	sampling strategy but invited programme completers/ Semi-structured focus group		Reflexivity discussed
Plateau et al., 2018	Overcoming Binge eating/ Part of a regular service provision in a	UK	To understand individual experiences engaging in a CBT GSH	All EDs, participants had BN, BED, OSFED (other specified	N= 4, female, mean age 29	Self-help book, guided from an assistant psychologist over 12-week, meeting once a week for 4 weeks	Purposive sampling if they completed the programme and no	Interpretative phenomenological analysis	24  Reflexivity not discussed.

	national health service			feeding or eating disorder)		and twice a month thereafter	longer met the diagnostic criteria, not active in seeking treatment to explore the full therapeutic journey/ semi-structured interview		
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Note: ED = eating disorder; BN = bulimia nervosa; BED = binge eating disorder; EDNOs = eating disorder not otherwise specified; RCT = randomised controlled trial; iCBT = internet cognitive behavioural therapy; cCBT = computerised cognitive behavioural therapy



Table 5. Themes from the included studies.

Paper	Themes
Pretorius et al., 2009	<ol style="list-style-type: none"><li>1. General impressions of the programme<ol style="list-style-type: none"><li>(i) Liked elements</li><li>(ii) Layout/presentation use</li><li>(iii) Disliked elements</li><li>(iv) Normalising effects</li></ol></li><li>2. Factors influencing choice of treatment<ol style="list-style-type: none"><li>(i) comparison with face to face therapy</li><li>(ii) Flexibility</li><li>(iii) Control over treatment</li><li>(iv) Accessibility</li><li>(v) Anonymity</li><li>(vi) Previous help seeking experience</li></ol></li><li>3. Hopes and expectations<ol style="list-style-type: none"><li>(i) Reduce symptoms</li></ol></li></ol>

	<ul style="list-style-type: none"><li>(ii) Control</li></ul> <p>4. Experience of using web-based package</p> <ul style="list-style-type: none"><li>(i) Comparison with face-to-face therapy</li><li>(ii) Flexibility</li><li>(iii) Convenience</li><li>(iv) Non-judgmental</li><li>(v) Impersonal</li></ul> <p>5. Support</p> <ul style="list-style-type: none"><li>(i) Enough</li><li>(ii) Not enough</li><li>(iii) Compared to web-based sessions at a fixed time</li></ul> <p>6. Motivation</p> <ul style="list-style-type: none"><li>(i) At beginning – motivated/ ambivalent</li><li>(ii) Over course of treatment</li></ul> <p>7. Impact of programme</p> <ul style="list-style-type: none"><li>(i) Bulimia Nervosa symptoms</li></ul>
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	<ul style="list-style-type: none"><li>(ii) General functioning and well-being</li><li>(iii) Knowledge</li><li>(iv) Stepping stone to further help</li><li>(v) Realised extent of difficulties</li><li>(vi) Influence of other factors</li></ul> <p>8. Recovery and future</p> <ul style="list-style-type: none"><li>(i) On the road now</li><li>(ii) Further help</li></ul> <p>9. Experience of interview process</p> <ul style="list-style-type: none"><li>(i) Reminder of work done</li><li>(ii) Motivator</li></ul>
Sanchez-Ortiz et al., 2011	<ul style="list-style-type: none"><li>1. Reasons for choosing this form of treatment</li><li>2. Experiences of treatment<ul style="list-style-type: none"><li>(i) Confidentiality/ privacy</li><li>(ii) Flexibility</li><li>(iii) Ease of use</li></ul></li></ul>

	<ul style="list-style-type: none"> <li>(iv) Feeling supported – including help with motivation</li> <li>(v) Content of programme</li> </ul> <p>3. Impact of treatment</p> <ul style="list-style-type: none"> <li>(i) Expectation about outcome</li> <li>(ii) Effectiveness – changes in ED symptoms</li> <li>(iii) Effectiveness – other changes</li> <li>(iv) Tools for coping in the future</li> </ul> <p>4. Comparison between iCBT and other forms of treatment/support</p> <ul style="list-style-type: none"> <li>(i) Counselling</li> <li>(ii) General practitioner</li> <li>(iii) Other forms of self-help</li> </ul> <p>5. Feedback</p> <ul style="list-style-type: none"> <li>(i) Timing</li> <li>(ii) Other methods of support</li> </ul>
Leung et al., 2012	<p>1. Improving awareness and understanding of eating disorders</p> <ul style="list-style-type: none"> <li>(i) Understand the causes of eating problems</li> </ul>

	<ul style="list-style-type: none"><li>(ii) Visualise eating problems</li><li>2. Enhancing motivation</li><li>3. Source of help and support with practical strategies<ul style="list-style-type: none"><li>(i) Help and support</li><li>(ii) Concrete and practical strategy</li></ul></li><li>4. Effectiveness in treating ED</li><li>5. Effectiveness in improving physical and psychological health</li><li>6. Factors influencing the success in self-help of battling EDs<ul style="list-style-type: none"><li>(i) Inhibiting factors</li><li>(ii) Enhancing factors</li></ul></li></ul>
McClay et al., 2013	<ul style="list-style-type: none"><li>1. Conceptualising EDs<ul style="list-style-type: none"><li>(i) Impact of and feelings about bulimia</li><li>(ii) Perceptions of EDs/ people with EDs</li><li>(iii) Acknowledgement of / acceptance of the problem</li></ul></li><li>2. Help-seeking<ul style="list-style-type: none"><li>(i) Past experiences</li></ul></li></ul>

	<ul style="list-style-type: none"> <li>(ii) Barriers to help</li> <li>(iii) Reasons for choosing help</li> <li>(iv) Prior knowledge</li> </ul> <p>3. The intervention</p> <ul style="list-style-type: none"> <li>(i) Support worker</li> <li>(ii) Positive aspects</li> <li>(iii) Negative aspects/ difficulties</li> </ul> <p>4. Motivation</p> <ul style="list-style-type: none"> <li>(i) Aids</li> <li>(ii) Challenges</li> </ul> <p>5. Participant engagement</p> <ul style="list-style-type: none"> <li>(i) Opportunity to help self and others</li> <li>(ii) Experience as an online research participant</li> </ul>
Traviss et al., 2013	<p>1. Necessity of having a guide</p> <ul style="list-style-type: none"> <li>(i) Roles</li> </ul>

	<ul style="list-style-type: none"><li>(ii) Skills</li><li>2. Therapeutic relationship<ul style="list-style-type: none"><li>(i) Client with positive outcomes</li><li>(ii) Client with poor outcome or drop-outs</li></ul></li><li>3. Suitability<ul style="list-style-type: none"><li>(i) Readiness</li><li>(ii) Client characteristics</li></ul></li></ul>
Shea et al., 2016	<ul style="list-style-type: none"><li>1. EDs and body ideals are socially and culturally constructed</li><li>2. Multi-faceted support is crucial to Mexican American women’s treatment engagement and success</li><li>3. Culturally-adapted cognitive behavioural-GSH programme is feasible and relevant to Mexican American women’s experiences but can be strengthened with increased family and peer support</li></ul>
Plateau et al., 2018	<ul style="list-style-type: none"><li>1. Autonomy and volition</li><li>2. Dynamic relationship: the guided and the guide</li><li>3. The unwanted friend</li></ul> <p>Participants were initially sceptical about the efficacy and usefulness of guided self-help, but gradually accepted and viewed the intervention positively through the course of the intervention.</p>

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Note: ED = eating disorder, iCBT = internet cognitive behavioural therapy

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Table 6. First-order (data in between “”), second-order (data in *italics*), and third-order constructs

Main concepts	Pretorius et al., 2009	Sanchez-Ortiz et al., 2011	Leung et al., 2012	McClay et al., 2013	Traviss et al., 2013	Shea et al., 2016	Plateau et al., 2018	Third-order constructs
Anonymity and Privacy	“I didn’t want anything on my record anywhere that might imply that I had a mental health issue. So I wanted to be completely	<i>Concern over the heading of “overcoming bulimia” on the screen of the programme</i> “A computer	N/A	“I’ve tried self-help books, you know looked at books in the library...I never really wanted to take them out because of the embarrassment of asking for	N/A	<i>Family-oriented and conformity made it difficult to make individual choices about food</i> “I will try to get my husband to	N/A	Absolute privacy was not achieved

	anonymous, and this was quite appealing”	wouldn’t judge me”		them over the counter”		follow the meal plan, but he won’t...so trying to get him to incorporate the GSH program into his life style would help. It’s like a family thing”		
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Accessibility and Flexibility	“a long way to travel into [clinic], so it’s much easier just to do it at home.”	“you can do it whenever, any day.”	<i>Helpful for people whose immediate neighbourhood does not have adequate mental health</i>  “Sometimes, it’s hard to access service services. We don’t have psychiatrists here, five	<i>Negative past experience with statutory services</i>  “I’ve been turned, turned away by I think it’s 4 GPs who’ve all said it’s not a problem...”  “ there isn’t much help out there...a long waiting list...”	N/A	<i>Commercial weight loss programmes were not contextually appropriate</i>	“when they used to talk about the waiting times and they said look if you need CBT, we’ll put you on the list for it but right now there’s this programme and so, in my head automatically	The advantages were only felt as other options were not available
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			hours away from Sydney.”				I just thought well it’s probably second best, but I don’t think that now”	
Guidance	“It was nice to have a bit of human contact as well working on my own on the computer”	<i>Guidance helped make experience more “real”</i>	“what was most helpful was receiving the emails and feedback, knowing that there was someone out in cyberspace	“...she has made a huge difference, so I appreciate all the chats I ‘ve had with her... yeah I think it’s made, it made a massive	“it was almost a collaborative project, which was nice”	“My supporter was very helpful...they never made you feel bad for anything you had done”	“I wouldn’t have done it as well. I don’t think I would have got the same outcome, I don’t think I’d be like, as	Guidance could enhance motivation

			listening to me and offering support”	massive difference”			good as I am now if I didn’t have [guide].”	
Agency/ Autonomy	“I wouldn’t want too much more support than that with the general format of the whole thing, because I think it would start	“it took you through step by step... the computer can do much more than a book... you just skip through [in	“It gives you suggestion on how to use different strategies to cope with your illness and also how you can control it, so that it is not	“You’ve got to just try and be determined haven’t you, set yourself the goals to do it”	<i>Guides identified those who achieved greater treatment benefits were more “willing to take responsibility”</i>	“oh my god this is the way my culture has taught me. But they gave you permission to express yourself out loud.”	<i>The process was effortful</i> “I was allowing myself food and I was trying to be okay with that and I	The role of self

	to defeat the object for you taking control and you taking responsibility of your problems”	a book] whereas if it’s on the computer you have to go step by step and then you can’t move on until you’ve thought about it and done it so that, I think was a lot	controlling you”  “...makes me more determined to fix myself”			“It would be a little bit more like doing it on your own, like taking ownership of this (program) rather than having the guidance. I think it’s more empowering to be able to	really was battling”  “I’d have to read a chapter of a book, and I’d have to complete certain tasks and every week I’d have to monitor what I ate”	
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		more effective”				know how to do it yourself and having a group of people going through it with you.”		
Self-motivation	“I knew I could help myself, but I just needed a bit of guidance, so I thought this	<i>Self-motivation could be difficult</i> “...especially to do it at home, you	<i>Facilitating and inhabiting factors of the effectiveness of the intervention included factors</i>	<i>There were aids and challenges in motivation and there was a general sense of low motivation</i>	N/A	N/A	<i>Extent of suffering made seeking treatment a necessity</i>	/

	was quite appropriate”  “there’s no one really to disappoint, yeah I think motivation was one of my major problems.”	come back, it’s tiring, then ‘you’ll do it tomorrow’ and then tomorrow comes and then I’ll do it this week end because I will understand better...”	<i>influencing people’s motivations</i>  “major stress in life makes self-help difficult” “I want to get better so I take in everything that helps me in the self-help strategies”	“Well, er actually, it was easier to just not really do it”				
Expectation/ Attitude	“it’s a lot harder to go	<i>The programme</i>	“when I decided I	“I just thought, if I don’t take	<i>Participants with positive</i>	N/A	“I need to readdress it...	/



to face-to-face therapy. For someone who has had problems and they don't want to get help, it would be the easiest thing, sort of like a stepping stone up to help themselves, and then	<i>gave tools and was a step towards recovery</i>	wanted to get better, I felt so sick that I have been sick. I want to do anything to get better"	this opportunity and sort of , em, give it my best shot, mm huh then I was going to go back to how I was"	<i>outcomes were described as having other "realistic or no expectations" in relation to outcome expectation or anticipated contributions of the guide prior to therapy</i>		it's making me miserable." there's this programme and so, in my head automatically I just thought well it's probably second best, but I don't think that now"	
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	perhaps after this go for face-to- face therapy..."				"those who were not hoping for a "prescriptive therapist" or a therapist with "magic wand"			
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Note: First order constructs present participants' views and interpretations in their own words. Second order constructs present the study authors' interpretations of the first order constructs. Third order constructs are the synthesis of both first and second order constructs