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Title: A qualitative exploration of barriers and facilitators to adherence to an online self-help intervention for cancer-related distress

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Abstract

Objective: This study qualitatively explored barriers and facilitators of adherence to an online psychological intervention for cancer-related distress. **Methods:** Semi-structured interviews were conducted with 13 adults with cancer, randomised to receive either a 6-week intervention (n = 8) or attention control (n = 5) as part of a larger RCT. Transcripts were coded for themes and subthemes, and recruitment ceased when saturation of themes occurred. **Results:** Adherence overall was high: six participants completed all 6 modules, three completed 5 modules, two completed 4 modules, one completed 1 module, and one did not access the program. The total number of barriers (n=19) and facilitators (n=17) identified were equivalent, and were categorised into five overarching themes: illness-factors, psychological-factors, personal-factors, intervention-factors, and computer-factors. However, the prevalence with which themes were discussed differed: illness-factors (specifically cancer treatment side effects) were the main reported barrier to adherence; intervention-factors (email reminders, program-satisfaction, ease-of-use, program-content) were the most common facilitators. **Conclusion:** While some factors were cited as both facilitating and barring adherence, and therefore reflective of personal preferences and circumstances, a number of recommendations were derived regarding (i) the best timing for online-interventions, and (ii) the need for multi-platform programs.

Online self-help therapeutic interventions for treating cancer-related distress are being increasingly explored, and hold considerable promise [1-8]. However, one notable limitation of this research in both cancer and non-cancer populations, is inconsistent adherence and high attrition [9], with non-completion typically ranging from 30-60% [10,11]. Given adherence can skew interpretations of efficacy, and moderate intervention outcomes – with longer exposure yielding greater benefits [12-15,11] – the importance of identifying user and intervention characteristics that impact adherence has become increasingly salient.

A recent systematic review of adherence to online psychological interventions for various health conditions found higher adherence was predicted by female gender, higher treatment expectancy, sufficient time, and personalised content [16]; mixed findings were obtained for age, baseline symptom severity and control group allocation [16]. However, only two oncology studies to date have been published: perceived usefulness, user-friendliness, and overall satisfaction predicted higher adherence to the BREATH program for breast cancer survivors [17]; while module recommendations/referrals, perceived relevance, and single marital status predicted higher adherence to an online intervention for early cancer survivors [18].

In light of these emerging, or mixed quantitative findings, it is clear that a number of factors may either facilitate or bar adherence to online interventions; qualitative studies are therefore required to provide a greater depth of understanding as to why these arise, and how they differ. Only four qualitative studies have specifically evaluated cancer survivors' experiences and expectations with online interventions, however all but one examined group support programs rather than self-directed therapeutic interventions [19-22]. Three studies identified barriers to adherence/participation [19-21], under four broad categories: (i) social barriers [19-21]; (ii) scheduling barriers [19,21]; (iii) program content [19]; and (iv) website difficulties [19]. Two studies examined facilitators and found increased use was associated with deriving benefit, feeling able to engage/communicate fully without judgement, feeling supported, and feeling able to disclose more freely [20,22]. The most recent qualitative study published [22] was the only one to examine a self-directed workbook or web-program in head and neck or lung cancer patients; they found adherence barriers related (i) to a preference for total self-management (i.e., no intervention); (ii) receiving adequate support elsewhere; (iii) finding the intervention too confrontational/distressing; (iv) not deriving benefit; or (v) anxiety/distress levels being too high for the self-directed format, with an associated preference for talking to a professional. Adherence facilitators related to anticipating or deriving benefit; expecting to save time and money compared to regular care; being altruistic (giving something in return for the medical care received, or contributing to improved health-care via participating); and a sense of duty to complete something once started [22].

While these studies collectively provide insight into adherence for online *group support* interventions, only the most recent study investigated an online *self-directed therapeutic* programs [22]. Whether these themes identified apply to patients with other cancer types, treated with curative intent, remains unknown. The current qualitative study therefore aimed to address this gap and explore adherence barriers and facilitators to a self-directed online intervention for cancer-related distress, called *Finding My Way* [23]. This analysis is a sub-study of a larger randomised clinical trial, examining the efficacy of the intervention compared to a web-based attention-control, on distress, coping, and quality of life outcomes.

Methods

The full protocol outlining the methods, measures and planned analyses for the RCT have been published previously [23]. Below, methods relevant to the qualitative analysis are summarised.

Participants

Participants in this sub-study were adults aged 18+ (range 31 – 89 years), who had completed participation in the *Finding My Way* clinical trial, recruited between 1st June and 2nd September 2014. With ethics approval, after the final 6-month follow-up assessment for the main trial, the first 14 participants enrolled were invited to participate in qualitative interviews, conducted via telephone for participant convenience; recruitment ceased once saturation of themes occurred. This process resulted in 13 participants consenting to be interviewed; one participant was unable to be contacted. The majority (n=8) had been randomised to the intervention group. See Table 1 for participants' characteristics.

Intervention Conditions

FMW is a 6-module/6-week online CBT-based intervention. Intervention-participants received access to all program components including cognitive-behavioural worksheets, a note-taking feature, and mood monitoring/ behavioural activation; participants allocated to the web-based control had access only to psycho-education and a resources section comprising links to other reputable websites.

Procedure

All semi-structured telephone interviews were conducted by one author (CB), a female Masters (Clinical Psychology) candidate with a BPsych(Hons) degree, who had extensive experience as a research assistant in mixed-methods and qualitative studies. Interviews were audio recorded, transcribed, and coded (see Table 2 for interview outline). Saturation was determined through an iterative process after each interview. One meeting per participant was conducted, after which the interview was transcribed and coded for themes. After completing the 12th-13th interviews, no new data was emerging, and saturation was deemed to have occurred.

Interviews lasted on average 17 minutes (range 5-29 minutes). Barriers and facilitators to adherence were explored for all participants, regardless of how much of the program they completed.

Data Analysis

Data were analysed thematically using NVivo [24]; two authors (LB & CB) systematically coded the first transcript at the semantic level [24], discussing each coded statement in order to develop an agreed coding system. One author (CB) then coded remaining transcripts. Codes were collated into emergent themes and sub-themes, and a thematic "map" was generated, which was then used to define final themes; these then formed the basis of the final report reviewed for accuracy by all authors. A second author (LB) then independently reviewed all transcripts to establish inter-rater reliability of data coding. Coding discrepancies were discussed and agreement with regard to the final themes reported was achieved between the two authors. Results were prioritised according to *prevalence* (raised by more than one participant), *frequency* (raised repeatedly within an interview), and *emotiveness* (themes raised strong feelings or resulted in a long discussion) [25]. Results were summarised by group-assignment.

Results

Adherence rates

Six participants (46%) completed all 6 modules, three (23%) completed 5 modules, two (15%) completed 4 modules, two completed 1 and 0 modules respectively. These sub-study adherence rates were representative of our larger RCT, where 41% completed all 6 modules, 61% completed at least 4 modules; while 10.5% completed no modules.

Barriers

As Table 3 shows, 19 individual adherence barriers were identified: illness-related barriers were most prevalent (n=11), followed by intervention-factors (n=10). Less frequently discussed, but rated as important, were computer/technology factors (n=5), psychological factors (n=4), and personal reasons (n=3).

Illness related factors.

Illness barriers were most comprehensively and frequently discussed. Within this theme, the most prevalent barrier was treatment side effects, with adherence reducing as a direct result of fatigue, lethargy, nausea, pain, and/or experiencing cognitive difficulties (e.g. attention and concentration difficulties). These were raised equally across intervention (n=7/8) and control (n=4/5) participants.

"Sometimes I just wasn't well enough, and other times it just wasn't where I

was at, at the time. And I didn't have enough energy to go back and suss out

what was going on". (Participant 11, Control).

In addition, participants also reported that when side-effects eased they prioritised other activities

instead of progressing through the *FMW* program:

"You know, you had a really bad week, and then you had your good week;

you didn't really want to be stuck sitting in front of a computer answering

questions about [cancer]. You just wanted to do other things". (Participant

13, Intervention).

Intervention factors.

This theme summarised those aspects of the intervention itself that formed barriers, with the most

prevalent being the timing of commencing the intervention. This was raised by both treatment-groups (n=7; 5

intervention, 2 control); specifically that the intervention was offered too late (n=5), or too early (n=2). Those

who had been offered the intervention towards the end of their treatment noted that it would have been

beneficial earlier:

"By the time I did it, I was nearing the end of my chemo. So in that respect a

lot of it was not all that relevant, because I'd already been through it all…".

(Participant 9, Control).

In contrast, the two participants who stated they were offered the intervention too early, were newly

diagnosed:

"I'd only just got my cancer and was just going through everything… I know

you're there to help deal with what you're going through right then and there,

but you're overwhelmed enough without trying to answer everything as

well". (Participant 13, Intervention).

Dissatisfaction with intervention content was cited as a barrier by 6 participants, and was raised more

often by intervention participants (n=5) than control (n=1). While not raised frequently, those who were

dissatisfied reported that the content was 'overwhelming' (n=2); 'repetitive' (n=2); or 'irrelevant' (n=2):

"It just seemed to be loads of information. There was a lot of information

there. And a lot of it was probably very, very useful, but I probably didn't

take it in". (Participant 7, Intervention).

Three participants (2 intervention, 1 control) described the module length as a pragmatic barrier to adherence, while the combination of module length and feeling unwell from treatment was also reported by one participant:

"It takes a lot of energy to do that so, I think I struggled because of that, because the length of the modules just seemed to take a long time; it was longer than what I had the energy for". (Participant 2, Intervention).

Two participants (1 intervention, 1 control) commented on the unguided format of the intervention as a barrier, while one intervention participant referred to experiencing the benefits of the content as reducing her need to continue engaging with the intervention.

Computer factors.

Five participants raised computer-related difficulties as a barrier: two control participants did not have adequate computer access, one intervention participant had unresolvable technical difficulties logging in to the modules, one intervention participant found her computer was too slow, and one control participant reported the location of her computer was inconvenient.

"When I was down in Adelaide for 6 weeks having my radiation treatment I was staying at Greenhill lodge, and I didn't have a laptop then, which I've now got. And you had to go in to use the computer in their lounge room. And that was a bit of a drag." (Participant 4, Control).

Psychological factors.

Psychological factors were cited by four participants as barriers. These included wanting to avoid the content or avoid thinking about cancer (n=3; 1 intervention, 2 control):

"…. I guess your brain was either overloaded with information from Doctors, or, or I had a tendency to go: 'I don't want to actually know any more'. You know, like I just need to deal with the facts of what they're telling me and if I look into it more then I just get worried about things...". (Participant 3, Control).

Other psychological barriers raised included feeling overwhelmed by their cancer diagnosis (n=3; 2 intervention, 1 control); already coping well or not needing psychological support (n=2; 1 intervention, 1 control); having expectations that did not fit with the program (n=2; 1 intervention, 1 control); and feeling unmotivated (n=2; 1 intervention, 1 control).

Personal Barriers.

Personal barriers were the least discussed barrier category, but included issues such as having insufficient time (n=3; all control), or forgetting to access the program (n=1 control).

Facilitators

As Table 4 shows, 17 individual adherence facilitators were identified, with intervention-facilitators being most prevalent (n=10) followed by psychological (n=6). Computer/technology factors were raised by five participants, with personal factors discussed the least frequently (n=2).

Intervention related factors.

The most commonly endorsed motivators for adherence were intervention related, as reported by 10 participants. Of these, the three most common facilitators were overall program satisfaction (n=5; 3 intervention, 2 control), high content relevance (n=4; 3 intervention, 1 control), and ease-of-use (n=4; 3 intervention, 1 control), as illustrated below:

> "I found it really useful so that's why I continued religiously along, along the whole course... I found it easy to navigate, the subject matter really good. I found the fact that you could make notes, or you could participate in varying levels with it. …. The flexibility of it, overall, I think it was excellent". (Participant 10, Intervention).

Five participants (3 intervention, 2 control) also stated finding the email or phone reminders motivating:

> "I think [I used it] because I got the prompts saying 'your next section is ready'. I was prompted to use it". (Participant 7, Intervention).

Of note, one intervention-related facilitator was raised only by intervention participants: the ability to self-pace through the program (n=3 intervention);

> "Because you can do it at a time that suits you as well. Rather than maybe fitting it in with somebody". (Participant 2, Intervention).

Other intervention-related facilitators included the self-help unguided format (n=2; 1 intervention, 1 control); appropriate timing of the program delivery (n=1, intervention) and finding program participation reassuring (n=1, control).

Psychological factors.

Six participants described six psychological factors that facilitated their adherence to *FMW*. First, a sense of altruism, or a desire to help future cancer patients out by participating, was described by four participants (3 intervention, 1 control).

> "I wanted to do it because I wanted to help other people". (Participant 11,
> Control).

Having social support was discussed by three participants (2 intervention, 1 control) as enabling their participation:

> "When my granddaughter came I just go and sit on a comfy chair in there and
> she'd get online and do it. And read me the questions. But if I didn't have
> her, I probably wouldn't have done it I don't think". (Participant 4, Control).

The remaining four subthemes were described by single participants: One participant reported being aware prior to the study that they needed psychological therapy (Participant 10, intervention); another intervention participant stated that their adherence resulted from a combination of (i) the program meeting her expectations of what it would provide, (ii) experiencing a sense of control over use of the program, and (iii) finding that the program focussed on her psychological wellbeing rather than just her illness:

> "I felt that it was something I actually had control over…I got my email and I
> could choose to do it when I wanted, at my leisure… could take away what I
> wanted from it. I could put it down when I didn't need to… even if you only
> get it once a month, it was something to add to your arsenal, 'oh I can do this
> something for me today', even if I only spent half an hour on it. And it was
> about <u>me</u>. You know what I mean, it was about my opinions, my thoughts,
> my feelings, it was about me. [laughs] not about my illness". (Participant 7,
> Intervention).

Computer factors.

The convenience and accessibility of a computer-based intervention was cited as a facilitator by four participants (3 intervention, 1 control):

> "It did help in the fact that when you're at home at night and you don't have
> access to a doctor or someone to speak to, then there was a reliable source
> that you could go to and read through [to] reinforce stuff the doctors had told
> you, or remind you of things you'd forgotten about, you know treatment

about what was going on. Like I say it was good to have available anytime".

(Participant 3, Control).

In addition, three participants (2 intervention, 1 control) each referred to intervention access on an iPad as motivating:

"I could just take it [with me], you know, I could get very comfy with it.

Because some of the topics are a bit…if you wanted to spend time with it,

which I did, you could just take it around with you and sit in the living room

in front of the heater and do it." (Participant 10, Intervention).

Personal factors.

Two intervention participants stated their program adherence was facilitated by having adequate time for participation, as they did not work during treatment:

"I had the time to do it. I think if I had been working full time, for example,

during that treatment, which some people do, I wouldn't - it would have

been quite stressful to do it. Because I really took my leisure at doing it".

(Participant 10, Intervention).

Discussion

This study explored barriers and facilitators to adherence to an online intervention for cancer-related distress. Despite the relatively high program-adherence, five broad categories, comprising 19 barriers and 17 facilitators, were commonly reported: illness/treatment-related factors; factors relating to the intervention/program itself; computer/technology factors; psychological barriers and facilitators; and personal factors.

Interestingly, only two differences in adherence facilitators or barriers emerged between intervention and control participants; one barrier (*module content*), and one facilitator (*ability to self-pace through the program*) were raised more often by intervention participants. The finding that module content was raised more often by intervention participants is unsurprising; the modules were longer and provided more information, activities, resources, and suggestions to progress through. This is consistent with our previous RCT findings that significantly fewer intervention participants completed the program compared to control participants [2], and with the recent systematic review indicating that control group membership had some support as a predictor of program adherence/completion [16]. An analysis of how participants would prefer to receive content, such as breaking modules down into smaller components offered more frequently, is warranted.

The facilitator discussed more often by intervention participants, *ability to self-pace through the program*, has been raised broadly across multiple health conditions as a benefit and reason for offering interventions online [26,22]. This is consistent with our recent systematic review that time-related factors are predictive of adherence [16], and replicates findings from a qualitative analysis of computerised cognitive behaviour therapy for depression (not cancer-related) [27], and of an online self-directed program for head and neck or lung cancer patients [22]. Why this was raised by intervention, and not control, participants in the present study is unclear; it may relate to the fact that intervention participants had more content to process, and the ability to self-pace therefore became salient in this context.

It is noteworthy that all categories (except treatment side effects) were discussed extensively as both facilitators and barriers to adherence: What motivated one individual acted as a deterrent for others. This was the case for four *intervention-related* factors (timing of commencing the intervention; program-content; self-directed format; experiencing symptom improvement), two *computer/technology* factors (convenience factors; iPad usability), one *psychological* factor (participant expectancies); and one *personal* factor (having/not having enough time). These findings are consistent with prior qualitative research on adherence in both cancer [19,20,22], and other populations [27-31,13], which demonstrated the importance of intervention content either as a barrier or facilitator depending on an individuals' experience. Similarly, computer-access ease or difficulties [32,27,33,13], having time or being too busy [29,34,13,22], and individual preferences regarding self-guided formats [13,27,22], have commonly been reported to impact on adherence broadly, and in the four previous qualitative cancer adherence papers specifically [19-22]. Of these, the three most commonly discussed factors warrant more specific discussion.

First, determining the best timing of commencing the intervention remains an unresolved issue; being offered the intervention 'too late' was a commonly listed barrier to adherence, consistent with evidence that early-intervention is related to better outcomes [35]. While the study aimed to recruit participants at diagnosis, the eligibility criteria included those receiving any active adjuvant treatment; some participants were nearing medical treatment-completion, thus reducing intervention content relevance. In contrast, other participants who did receive the intervention at diagnosis stated this was 'too early', not only due to being overwhelmed by the diagnosis itself, but by the multitude of other information received simultaneously, which impacted on uptake and adherence. Finally, a select number of participants identified timing as a facilitator, due to receiving the program at a time where the content had highest relevance. This issue clearly requires further exploration.

A second recommendation, on the basis of access preferences/difficulties uncovered, is that future online programs should be multi-platform in nature, such that interventions can be used across the full range of smart devices (tablets, mobile phones), as well as computers, to enable greater access. While users reported using iPads and other tablet-based devices in the present study, *FMW* was designed as a desktop-based program, and its usability on tablets was variable, as reflected in feedback. All four computer-barriers raised in the present study would be addressed through a multi-platform program.

The single exception to the pattern of facilitator/barrier overlap was the category of *treatment-side effects*, which was discussed only as a barrier, and is consistent with prior studies on adherence to depression/anxiety online interventions [30,13], where the severity of physical or mental illness symptoms reduced adherence. It is unsurprising that the known treatment side effects, including fatigue [36]; pain [37]; nausea and vomiting [38]; and subjective cognitive impairment [39]; were cited as barriers to adherence in the current study, however the management of these problems is in fact a major focus of *FMW*. This vicious cycle - when the very symptoms that are targets for treatment become the barriers preventing engagement, and therefore reducing those symptoms – is an important challenge for the future implementation of these resources. Further research is required to examine how best to address this difficult issue, especially given the associated problematic length of modules and energy required to engage with *FMW*. This would provide useful feedback for the appropriate tailoring of content length, and style, to the population the resource is designed for.

The findings of this study need to be considered in light of five limitations. First, males were not represented in our sample and their participation in the RCT was low, limiting the generalizability of results. This finding is consistent with the literature demonstrating gender differences in both the uptake and usage of online interventions [40], and suggests that online interventions may have less appeal to males. Second, while this study aimed to examine predictors of adherence on a continuum from low to high, the high adherence-rates that were observed may have limited the range, and generalizability, of barriers discussed. Barriers might exist for low-adherers that were not raised in this study; alternatively, barriers not highly endorsed in this study, such as lack of time, may be more prevalent amongst individuals with lower adherence. Future studies that purposively sample low-adherers would greatly benefit this literature, particularly given that research indicates adherence rates in clinical trials are far higher than in the real world / clinical setting where adherence to open access web-programs vary from as little as 0.5% [12] to 18.4% [41]. Therefore while the current results are informative for those planning clinical trials, further research is required to determine what adherence rates, barriers and facilitators arise in the real world setting. Third, while saturation of themes was reached, this study

was limited by the sociodemographic composition of the sample: Caucasian, English-speaking, highly-educated and literate. The ability to generalise findings to culturally and linguistically diverse participants is likely to be low. In light of these limitations, further research with a larger mixed-gender sample is required to replicate and extend the findings obtained in this study. Finally, we acknowledge that the sample size for this study is small; however this is not necessarily a barrier to saturation of themes in itself; saturation of themes was found in a methodological study [42] to occur within the first 12 interviews, reflective of the experience in collecting data for the present study, for which no new themes with respect to facilitators and barriers to adherence were emerging by the time the 12th and 13th participants were interviewed.

In conclusion, this study both supports and expands on the literature on predictors of adherence to online interventions [19-22]. In particular, this study highlights the need to refine the timing and format of how these interventions should be offered, in order to ensure content relevance and engagement.

Conflicts of Interest

Ethical approval: All procedures in studies involving human participants were conducted in accordance with the ethical standards of the Southern Adelaide Clinical Human Research Ethics Committee, the Royal Brisbane and Women's Hospital Human Research Ethics Committee, and the ACT Health Human Research Ethics Committee, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants in the study.

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Table 1. Characteristics of interview participants

	Interview Subjects (n=13)
Age *M* (SD) (years)	50.62 (8.60)
Females	13 (100%)
Randomised, n (%)	
Intervention	8 (61.5%)
Control	5 (38.5%)
Married / partnered	8 (61.5%)
Employed	9 (69.2%)
Tertiary Education	6 (46.2%)
Ethnicity	
Australian	10 (76.9%)
Other[a]	3 (23.1%)
English first language	13 (100%)
Urban residence	10 (76.9%)
Cancer Type - Breast	13 (100%)
Weeks since diagnosis *M* (SD)	18.15 (9.63)
Treatment received	
Surgery	12 (92.3%)
Chemotherapy	12 (92.3%)
Radiography	8 (61.5%)
Modules completed *M (SD)*	4.62 (1.98)

Note. [a] = other includes other Caucasian, African, Asian and unspecified;

Table 2. Topic Guide Template

Topic Area	Questions:
Overall adherence	• "How much of the intervention did you use overall/complete?" • "In general, what things influenced your dropping out/ completing the intervention?"
Intervention factors	• "Overall, how would you describe your satisfaction with the intervention?" • "Were there any aspects of the intervention that made you feel more or less inclined to use it?" • "Specifically, did you find the information to be: relevant, interesting, and of good quality: and did your level of satisfaction with the information influence how much you used the intervention?" • "What did you think about the interface and structure of the intervention" • "Were there any particular modules that you liked/disliked compared to others?" • "In what ways was the intervention difficult to use?" • "How convenient did you find the intervention to use?"
Internet factors	• "Did you have any difficulties relating to using a computer or the internet?" • "How did you feel about the amount of time required to complete each module, and the whole program?" • "Overall, how did you find the online self-help format of the intervention?"
Personal factors	• "Was there anything relating to your personal life or circumstances that made it difficult for you to use the intervention?" • "What things, either personal or relating to the program, might have increased your use of the intervention?"
General feedback	• "Would you use an intervention like this again?" • "Did you intend to use the intervention more than you actually did?" • "Overall, do you feel the program was worthwhile and did it help you?" • "On a scale of 1 to 10, how would you rate your overall experience of the *Finding My Way* program?" • "What things contributed to you giving the intervention that rating?" • "Do you have any other comments or things you would like to share about your experience with *Finding My Way*?"

Table 3. Specific themes associated with program adherence-barriers, for the full qualitative sample and by group

Theme	Pooled sample (N=13)	Group (I: N=8 / C: N=5)[a]	Description of theme
Illness	***11***		
Treatment side-effects	11	7/4	Unable to login due to (a) specific side effects (e.g., fatigue, nausea), or (b) competing interests occurred on days when participants felt well (e.g., exercise, socialise).
Hospitalised	1	0/1	Hospitalised following a chemotherapy cycle.
Intervention	***10***		
Timing of intervention	7	5/2	Participants received intervention either too late (near end of treatment) or too early (prior to adjuvant treatment commencing) – therefore reducing content relevance.
Content	6	5/1	Content found to be irrelevant / uninteresting, overwhelming or worrying, repetititive.
Module length	3	2/1	Modules took longer to complete than anticipated, and unsure whether it could be completed over numerous days.
Lack of guidance	2	1/1	Would have preferred guidance / support throughout the modules / program.
Modality preference	1	1/0	Preference for face-to-face.
Symptom improvement	1	1/0	Experiencing benefits, no need to continue.
Computer/Technology	***5***		
No computer access	2	0/2	For reasons including travelling / not residing at home during treatment
Interface & website	1	1/0	Unable to open the modules.
Computer difficulties	1	1/0	Participant's computer speed was too slow and frustrating, preference for smart-phone App
Computer location	1	0/1	Computer remotely located within the home, inconvenient to use
Psychological	***4***		
Avoidance	3	1/2	Wanting to avoid thinking about cancer, fearful of what they might read / learn.
Feeling overwhelmed	3	2/1	Feeling overwhelmed by the cancer diagnosis, participation felt too difficult.
Expectations	2	1/1	Participation was more involved than expected, had thought it was just a survey.
Coping well	2	1/1	No need for the program, as they were coping well without accessing it.
Unmotivated	2	1/1	Could not be bothered participating.
Personal	***3***		
Lack of time / too busy	3	0/3	Other commitments (parenting, work) reduced available time for using the program
Forgetting	1	0/1	Forgetting to log in / access new modules, despite reminders.

Notes. [a]I=Intervention, C=Control

Table 4. Specific themes associated with program adherence-facilitators, for the full qualitative sample and by group

Theme	Pooled sample (N=13)	Group (I: N=8 / C: N=5)	Description
Intervention	10		
Program satisfaction	5	3/2	Found the program informative, helpful, and worthwhile.
Email reminders	5	3/2	Receiving prompts/reminders to access the next module helped combat memory problems.
Easy to use	4	3/1	The program was intuitive, good optional activities if interested, and easy to navigate.
Content	4	3/1	High relevance of content, credible / trusted source of factual information,
Ability to self-pace	3	3/0	Can go at own pace, do in own time
Self-help format	2	1/1	Addresses issues that you might not think of, or are too embarrassed to ask about, to ask face to face
Reassuring	1	0/1	Program participation provided reassurance that patient was coping well.
Timing of intervention	1	1/0	Received the program at the ideal time, modules followed exact pattern of treatment.
Psychological	6		
Altruism	4	3/1	Desire to help others by participating (i.e., research outcomes will benefit future patients).
Social support	3	2/1	Social support enabled patients to structure their time so they could access the program.
Expectations	1	1/0	Expecting that using the program would help, willing to take any advice/resources on offer.
Taking Control	1	1/0	Using the program represented taking control of an aspect of treatment.
Perceived need for therapy	1	1/0	Knew prior to participating that they needed some form of psychological treatment.
Was about me	1	1/0	Doing something to help that was not illness-related for a change, but was about sense of self/individual (opinions, thoughts, feelings).
Computer / Technology	5		
Convenience	4	3/1	The online format was convenient.
iPad use	3	2/1	The program worked well on the iPad, so they could find a convenient/comfortable location to use it.
Personal	2		
Available time	2	2/0	As participants were not working during chemo / no dependents, they had available/free time to commit to regular program usage

Notes. [a]I=Intervention, C=Control