

Understanding acceptability of and engagement with online interventions for cancer survivors- a systematic review.

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Abstract

Purpose

Much research on online interventions to improve quality of life after cancer treatment is at an early stage. We sought to synthesise currently available literature in order to inform the development of future interventions.

Methods

We included a variety of study designs (qualitative research, feasibility/pilot trials, randomised trials, and process evaluations), and used thematic analysis to identify features of online interventions which might be important for intervention outcomes such as acceptability, feasibility, engagement, and effectiveness.

Results

Sixteen papers describing nine interventions were analysed.

Our findings suggested that cancer survivors value easy to use, accessible interventions that were delivered at the right time-point in the recovery trajectory and allow them to choose content specific to their changing needs. Social networking features did not always provide any added benefit, and behaviour change techniques such as self-monitoring and action planning needed to be designed carefully to be feasible and avoid potential negative consequences for some individuals. Participant feedback seemed useful to ensure that the intervention was appropriate for the target users.

Conclusions

This review provides insight into factors that appear to influence engagement outcomes in online interventions for cancer survivors, which may be useful for designing interventions for this population.. The common themes identified across the very different types of study and intervention confirm that thematic synthesis may help researchers identify key features of potential importance when there is limited definitive trial evidence available.

Implications for Cancer Survivors

Interventions appeared to be most successful when they recognised and addressed the unique challenges faced by cancer survivors, and were well matched to their changing needs. This review may facilitate the development of interventions that are more engaging for cancer survivors.

Keywords

Cancer; survivorship; digital intervention; review; online; intervention development

Background

The number of cancer survivors is increasing over time as a consequence of earlier diagnoses and advances in treatment[1]. Long-term survival data reveals that there is now a life expectancy of 10 years or more for some common cancers[2]. The period following primary treatment is a critical time in the cancer trajectory, often characterised by ongoing symptoms, and poor general health [3]. Prolonged symptoms lead to ongoing challenges for post-treatment cancer survivors and delay return to normal life [4]. The Internet is increasingly being used as a resource by cancer survivors [5]. Online interventions can provide an efficient method of improving support for cancer survivors [6], as they can incorporate multiple and complex behaviour change techniques, while overcoming frequently cited obstacles to seeking support after cancer treatment such as time, mobility, and geography [7].

We sought to synthesise the growing evidence base that relates to online interventions directed at improving quality of life in cancer survivors, in order to inform the development of an acceptable and feasible new intervention. Previous reviews of interventions for cancer survivors have focused on questions of effectiveness, by reviewing controlled trials [8-10]. However, much of the literature on online interventions for cancer survivors is at an early stage, and currently consists mainly of intervention development and feasibility studies. Systematic reviews are useful to synthesise research findings [11] but are most appropriate when strong evidence bases (of homogenous datasets) exist [12, 13]. Reviews of heterogeneous, complex interventions often conclude that the evidence is ‘weak’ or ‘mixed’ [10, 14] and often fail to address intervention usability and acceptability[11]. For intervention design, it is important to understand how an intervention works in and suits a given context [13, 15]. Integrating and implementing all currently available evidence on online interventions for cancer survivors, rather than simply definitive trials, could inform decisions regarding intervention design and delivery [15].

Systematic reviews have started to incorporate a wider range of study designs (e.g. qualitative research) to address questions relating to intervention processes, and acceptability [12, 16]. Some new approaches to review such as thematic synthesis [11]and Intervention Component Analysis [17] can be used to try to interpret variations in findings of different interventions, and allow comparisons to be made across studies with similar objectives, but which may be different in many respects [17]. For example, Thematic Synthesis [11] has been used to address questions relating to intervention need, appropriateness and acceptability. The method adheres to key principles of systematic reviews[16], using rigorous and explicit methods to synthesise primary research, while incorporating the experiences and views of intervention participants. Findings from ongoing or qualitative research may not lead to firm conclusions about the effectiveness of the intervention, yet may help researchers to identify important issues relating to trial feasibility for future work [18]. Identifying components in a multicomponent intervention that are likely to be necessary for trial implementation [2] can inform a novel, composite online intervention that meets the needs of cancer survivors [19].

This review aimed to thematically synthesise findings from a range of studies with different designs in order to identify features of online interventions for cancer survivors which might be important for acceptability, feasibility, engagement, and effectiveness[11, 18].

Methods

Inclusion and exclusion criteria (See Table 1) were employed to identify studies that could provide qualitative and quantitative data relating to online interventions for cancer survivors, focusing on breast, prostate and bowel cancer (or cancers considered similar in terms of quality of life issues) since these were the target population for the intervention we were developing. Studies considered included surveys, focus groups, individual interviews, and

data from feasibility and pilot trials, RCTs, and process evaluations. Studies were identified in May 2016 using electronic bibliographic databases. Further details of the search strategy can be seen in Appendix A. Due to time constraints, we followed rapid review methods [20-22].

INSERT Table 1. Inclusion and Exclusion Criteria for Studies in Review

Data collection and analysis

One review author (LP) conducted the initial searches. Two authors (LP and TC) independently screened titles and abstracts. Titles not relevant to this review were removed. TC and KS independently screened the remaining titles and abstracts for eligibility. Ineligible studies were excluded, with each author recording the reason for rejection. Full-text copies were screened when there was not sufficient information to definitively include or exclude based on the abstract. Differences between the two reviewers were resolved by discussion, with the involvement of a third reviewer if necessary (KB).

Quality Appraisal was conducted using the Critical Appraisal Skills Programme (CASP) quality assessment tools for quantitative and qualitative studies [23] and the Critical Appraisal of a Survey tool developed by the centre for Evidence-Based Management [24]. Appraisal was performed by TS and KS on each study independently and then discussed. The authors tabulated quality assessments of the studies based on the categories used in the CERQual (Confidence in the Evidence from Reviews of Qualitative research) Approach for assessing the confidence of evidence from reviews of qualitative research [25] (See Table 2.).

Procedures

TC and KS independently extracted all available information regarding intervention characteristics, experiences, and outcomes from the Results and Discussion sections of the papers, using a standardised data extraction form (See Appendix B). All data were electronically extracted, and synthesised as textual (qualitative) data. Authors' interpretations in the Discussion were included, as these can be considered qualitative evidence that may provide insights about the perceived strengths and weaknesses of interventions as well as the experience of development, use and implementation[17].

The synthesis and analysis of the data was conducted in line with thematic synthesis [11]. Initially, we aimed to develop a description of the relevant features and outcomes of the interventions [11, 17, 26, 27]. TC and KS carried out the coding and analysis, with iterative in-depth discussion of emerging themes with LY and KB. We conducted line-by-line open coding of the method, findings, and discussion sections of included studies. We used one paper deemed to be of high quality (*RESTORE* [28]) to develop a coding manual and tested its reliability on two other papers. A sample paper was checked by a third co-author (KB) to ensure coding consistency. The remaining texts were coded, with authors discussing additional codes where any novel concepts were identified [11].

We grouped these codes according to similarities and organised them into descriptive themes [11]. Descriptive themes remain 'close' to the reported findings. .

Analytical themes were then generated based on identified clusters of descriptive themes. Analytical themes are used to facilitate the development of new interpretive explanations or hypotheses[11]. Our analytical themes were constructed based on their relevance to the research question that we had outlined a priori, namely “what features of online interventions

for cancer survivors might be important for acceptability, feasibility, engagement, and effectiveness?”. This process allowed us to derive our outcomes of interest from the data, based on pre-specified aims of the research. Our analytical themes therefore grouped the descriptive themes into outcomes and factors that might influence outcomes. We then engaged in a process of mapping these influential factors onto the outcomes. This allowed us to explore the relationship between them, in order to identify which features of online interventions impact each of the individual outcomes.

Results

Characteristics of papers and interventions

Papers were excluded where: interventions targeted caregivers or partners (n=2); some or all participants were undergoing active medical treatment for cancer (n = 20); the focus was on needs associated with specific cancer types (e.g. gynaecological/ head and neck cancers) or specific problems (e.g. sleep disorders/ sexual dysfunction) rather than general quality of life issues (n = 7); not online interventions (n=6); needs assessments (with no data relating to actual intervention experience) (n=5). One intervention was excluded as it focused on a paediatric sample. Multiple papers relating to the same intervention were included, with each paper identified by the name of the intervention. Figure 1 shows the number of papers screened and reasons for inclusion/ exclusion. In total, 16 relevant papers pertaining to nine interventions fulfilled all eligibility criteria for inclusion. Further details can be seen in Table 2. We included studies regardless of study quality, but used quality assessment to assist the reader to determine the relative quality of each study included in the analysis (See Table 3.).

Three trials focused on multiple health behaviour changes; physical activity and diet. These were the *WSDEI (Health Planner)* [29], *Survive and Thrive* [30, 31] and *Kanker Nazorg Wijzer (KNW)* [32, 33] trials. Two trials (*RESTORE* [28, 34, 35] and *Health Navigation* [36]) addressed fatigue in cancer survivors. *BREATH* [37, 38] and *STRIDE* [39] also specifically targeted particular outcomes (i.e. distress and physical activity). The *Oncowijzer* [40, 41] and *Prostate Cancer Education and Resources for Couples (PERC)* [42] studies focused on cancer survivors and their partners during the transition into survivorship (see Appendix B for full study descriptions).

Insert Table 2. Trial Details

Insert Table 3. Quality Assessment of Included Studies

Insert Figure 1. PRISMA Flow Diagram

Themes identified in this review

We identified 28 descriptive themes which we grouped into five analytical themes (see Fig 2). The first four themes addressed specific aspects of intervention designs and implementation of online interventions. The themes were:

- i. Participant factors
- ii. Characteristics of the online intervention
- iii. Techniques used to change behaviour
- iv. Preferred features of online interventions

These themes were seen as key factors that appeared to potentially influence the outcomes discussed in the papers (which constituted the fifth analytical theme), i.e. uptake, adherence

and attrition, engagement, feasibility, efficacy, positive behaviour change and acceptability of the interventions. To address the aims of the review, we present our analyses below in terms of how each of the first four themes appeared to relate to each of the outcomes discussed in the papers.

In reporting our findings, we have illustrated each concept using the name of the study it originated from, but also in terms of the type of information source from which the code emerged. Codes derived from statements by study authors were marked with “Au” and participant sources were identified as “Ps”. Quantitative evidence or statistic-based findings were identified with “Q” .(i.e. Au, Ps or Q).

Insert Figure 2. Depiction of analytical and descriptive themes, and their hypothesised relationship

Uptake

Uptake included data concerning comments regarding recruitment, as well as patterns observed by the study authors. Individuals took part in the interventions due to perceived unmet care needs, personal interest, and motivation (Au) [31, 35, 39, 41, 42]. Characteristics of those who did not take up the intervention were often not recorded.

Technology was seen as a means of potentially increasing access to supportive care for those who cannot (or prefer not to) engage in traditional care, particularly those with sensitive symptoms and illness issues (Au; Ps) [28, 35, 42]. The timing of the intervention may influence uptake. The authors of the *Oncowijzer* study suggested preparing for cancer survivorship before treatment commencement and continuing soon after completion(Au)[41]. In *RESTORE* participants described the timing of participation (from 3 months post-treatment) as ‘about right’, with participants at least one year post-diagnosis indicating they would have preferred access sooner (Ps;Q)[28, 35]. One participant suggested that after a certain stage, the information may be less beneficial: “*I suppose it’s also that sense of wanting to kind of move on from it as much as possible...it would be a daily reminder*”(Ps) [38; pg. 6]

Adherence and attrition

This referred to participant adherence to, and drop-out of, the trial. Commonly reported reasons for attrition included being busy, and cancer recurrence [29, 36]. Family death, comorbid physical problems, and family illness were also cited as a reasons for dropout (Q;Au) [36, 42]. Demographic predictors of dropout included factors such as male gender, lower income, and higher levels of distress (Au;Q)[31, 35, 38, 42].

Higher attrition in the online intervention arms may have been due to participants struggling with the web-based nature of the trial (Au;Ps) [28, 29, 35, 40]. Some authors suggested that accessing the intervention added burden and/ or required routine adjustments (Au; Ps) [28, 35, 40]. However, some studies reported lower levels of attrition than average for online trials for cancer survivors (Q;Au) [29, 36, 42] [33]. This was attributed to participants’ motivational readiness to engage (Au) [29, 36] and the relevance of the content (Au) [29, 33, 42]. Other reasons suggested were the convenience for participants being able to access the intervention at their own pace, when it suited them (Au) [29, 33, 36, 42] and the ease of use an accessibility of the content (Au) [29, 33, 36, 42].

Engagement

Engagement focused on the extent to which the user engaged with the intervention content (i.e. extent of use- duration and/or frequency). Online interventions allow researchers to

identify patterns of use, and how these may be related to outcomes (Au) [28, 31, 33, 40, 43]. Additional research to better understand these processes was recommended (Au) [28, 31, 33, 40, 43]. Authors noted that lower levels of engagement may be linked to some participants experiencing an early effect, making further use of the intervention redundant (Au) [43]. However, generally, evidence suggested that participants who engaged more with the interventions appeared to get the most benefit (Q) [28, 31, 33]. Authors highlighted the importance of actively motivating participants to engage with the online intervention content, for example using prompts and reminders (Au) [31]. For example, usage in the *BREATH* intervention varied considerably and logins were on the day the weekly reminder was sent (Q)[43].

Findings indicated that participants engaged more when they reported unmet needs, lower self-esteem, and a need for social support(Au;Q) [40, 43]. Participants often chose to access information and content pertaining to physical and social consequences of cancer, returning to work, and communicating with others (Au;Ps;Q) [30, 31, 41]. Other cited factors included computer literacy and socio-economic status. High usage rates in the *PERC* trial were deemed encouraging by study authors, particularly because the intervention targeted older adults (Au) [42].

The exclusion of certain groups (limited information technology skills; elderly) was a concern for many authors (Au) [28, 29, 35, 36, 40]. Online interventions did not seem to appeal to all, and some individuals did not ever access the intervention (Au; Q)[40]. Reasons for not fully engaging included illness burden, perceiving content as irrelevant, not useful, or not required (Au; Ps)[29, 39].Barriers to using these interventions included glitches and problems with functionality (such as difficulties logging on; passwords being refused or forgotten), and screens freezing or closing unexpectedly (Au;Ps) [28, 35].

Feasibility

Feasibility related to descriptions by the authors about the intervention being easy or convenient to deliver and factors relating to the work required to participate. Online interventions offered a feasible approach to providing supportive care after cancer (Au)[29, 31, 33, 36, 38-40, 42] and were considered particularly beneficial for those who have limited access to supportive care (Au) [31, 39, 42]. Ease of participation was an important facilitator of engagement and participants required low levels of assistance to use the interventions (Au; Q)[28, 29, 31, 33, 36, 38-40, 42]. Easy to use, interesting, informative, and comprehensible interventions were found to be feasible (Au) [28, 31, 33, 40, 42].

Accessibility was improved by involving stakeholders during intervention protocol development, and end users during usability testing (Au) [28, 32, 33, 35, 38, 40, 42].

Online interventions were designed to be incorporated into participants' lives easily, yet some required additional work and/or routine adjustments for participants (Au) [29, 31, 32, 34, 36, 39, 40, 42]. This was particularly difficult when the participant had external burdens (e.g. competing demands such as family and work commitments, etc.) or were feeling unwell (e.g. experiencing pain or fatigue)(Au;Ps) [35, 39]. Dealing with technical difficulties, and completing fatigue diaries were sometimes cited as burdensome by participants (Au;Ps;Q) [35, 39, 42].

Efficacy

This referred to effectiveness of the intervention in relation to specified outcomes. In many cases, due to the exploratory nature of some of the trials, the limited data, small sample sizes,

or lack of a comparator group meant that it was not possible to draw firm conclusions about the efficacy of these interventions [36, 38, 39, 42].

Satisfaction

Here, we refer to participant reflections on taking part in the trial, and perceived benefits directly related to the intervention(s). User feedback was sometimes used to improve the intervention, with users displaying a preference for content chosen by end users who contributed to the design of the intervention (Au;Q)[40]. (Au) [35, 42]. Participants liked convenient and readily available online interventions that had content that was clear, novel, and well organised (Au;Ps;Q) [29, 31, 35, 36, 39, 40, 42].

Participants liked being able to choose the elements of the intervention that they engaged with (Au;Ps)[33, 39, 40], which was seen as a means to reduce information overload (Au) [32, 34, 36, 39, 40, 42]. In some studies, specific content was recommended but participants could select topics that had a higher priority for them (Au)[31, 32, 40].

Findings were mixed regarding the use of in-person support. Social networking components (e.g. webmail and discussion boards etc.) were perceived as useful (Au; Q ;Ps) [30, 31, 39]. However, participants differed in the extent to which they engaged with social networking features (Au; Q)[30, 31, 39]. In some trials, participants preferred to read posts rather than to comment themselves. Others indicated that these features did not interest them (Ps) [30, 31, 39].

Many individuals considered online interventions superior to offline comparators (Ps) [28, 35]. Participants appreciated the ability to access straightforward information and valued material that addressed relevant issues such as feeling guilty, healing, achieving normality, and fears regarding recurrence (Ps; Au;Q) [28, 35, 40, 42]. However, others found the interventions impersonal, simplistic, and vague (Q)[39, 40] and suggested incorporating more detailed or cancer-specific information and practical advice, as well as signposting to resources (Au; Ps) [35, 38, 42]. Some participants showed a preference for offline media, and/or struggled with using an online intervention (Au;Ps)[28, 29, 31, 35, 39, 40, 42]. Authors recommended that online interventions should be part of a multi-modal care model, supplemented by other forms of post-treatment care (e.g. informative brochures, consults with a psychologist etc.) (Au)[29, 35, 37, 42].

Positive behaviour change

We also analysed the impact of behaviour change techniques on behaviour or antecedents of behaviour.

Information provision was a commonly used strategy to promote behaviour change in these interventions (Au) [28, 32, 33, 40, 42], and included signposting to existing supplementary support resources and resources intended to facilitate follow-up conversations with healthcare professionals (Au; Ps) [28, 33, 38, 42]. Established national and international guidelines informed the content of many interventions (Au) [28, 29, 31, 33, 36, 39, 42]. Other interventions were based on modified versions of pre-existing interventions (Au) [31-33].

Goal management prompted participants to prioritise activities, recognise limitations, and engage in self-reflection about lifestyle and behaviour and was widely regarded as motivating, (Au; Ps) [28, 30, 32, 33, 35, 36, 39]. *STRIDE* included step goal approach based on goal setting theory, which promoted goals that were perceived as attainable with respect to the individual's capacity. This reduced feelings of guilt on days participants felt unwell (Au; Ps) [39].

Self-monitoring helped participants to better recognise symptom patterns, reflect on their progress, increase personal accountability, and develop self-awareness (Au;Ps) [29, 35, 36, 39]. However, diary keeping was sometimes difficult to incorporate into daily routine (Au;Ps)[28, 35]. Behaviour feedback on progress potentially increased perceived self-efficacy (Au) [29, 31, 35, 42].

Action planning was used in some studies to improve motivation and may positively influence changes in health outcomes (Au;Q) [28, 29, 31, 36], but could sometimes be problematic (see ‘Negative consequences for some users’ below).

Negative consequences for some users

Some authors did not consider any adverse events as attributable to the study (Au) [36] [28]. However, in the *RESTORE* trial some users considered the content of the intervention to be more suited to those undergoing treatment and therefore an unwelcome reminder of their cancer (Au;Ps) [35]. The authors of the *Survive and Thrive* trial found that attempting action planning and failing led to reduced activity levels in some cases (Q) [31]. Action planning strategies may not suit those who continually fail to complete their action plans (Au)[31]. Some couples in *PERC* reported decreased relationship satisfaction and communication about cancer (Ps; Q)[42], with some individuals reporting increased sexual dysfunction over time (Ps;Q)[42]. The authors suggest that participants may have found it difficult to adjust to novel ways of relating to each other: the intervention may have introduced concepts and ideas that were different to their long-standing relationship and communication patterns, leading to participants finding it challenging to talk about sensitive topics they may not have discussed before (Au) [42]. Finally, in the *BREATH* study one woman was admitted to a psychiatric clinic (Q)[38]. The authors considered this as a serious adverse event (Au) [38]. Further, a pattern emerged where more high-distress survivors in the intervention group showed a clinical deterioration (Q) [38]. These findings suggest that high-distress Breast cancer survivors may need a more intensive intervention than *BREATH* (Au) [38].

Discussion

Sixteen papers relating to nine online interventions designed to improve outcomes in post-treatment cancer survivors were analysed in our review. Common themes were evident across the papers, suggesting that it is possible to combine, and learn from, papers reporting many different study designs, including qualitative reports and findings of early-stage interventions.

Ensuring that the intervention fits with the users’ characteristics appears to be key to the successful implementation of online interventions for cancer survivors. Interventions appeared to be most successful when they were developed and delivered in a manner that recognised the unique challenges faced by cancer survivors. The uptake of, and engagement with, online interventions for supporting cancer survivorship was influenced by the users’ motivation and need for support. Users preferred content that was specific to the needs of cancer survivors. Users appreciated being able to choose to address particular problems that had a higher priority for them. This is particularly appropriate for cancer survivors as their unique needs are likely to vary greatly during the post-treatment period [40, 44].

Further, it is crucial that the appropriate target sample is identified and recruited into the trial. Previous reviews have suggested that efficacy of online interventions is varied due to factors including the timing of the interventions, targeting the wrong patients, or using an unsuitable mode of delivery [45, 46]. In some of the studies in this review, participants perceived the intervention or its content as irrelevant or unnecessary. Online information presented could be perceived as impersonal or vague. This issue could be overcome by including more

specific or tailored information regarding the unique needs of those after cancer [40]. Some participants did not perceive a need for the intervention. In particular, some engaged in the trial as a research volunteer rather than to actively seek strategies to improve quality of life[35]. In our review, some participants indicated they would have preferred this type of intervention closer to the end of treatment, raising questions about the timing of the delivery. In *RESTORE*, those who were at later stages of survivorship felt some elements were more suitable to individuals with a current diagnosis or soon after treatment[35]. Conversely, the authors of *Oncowijzer* note that their website may be more relevant to those at later stages of survivorship, with website users having ended treatment about 4 months prior to use, and non-users being on average 3 months posttreatment. It is therefore difficult to reach a conclusion about the optimal timing of an intervention [47]. Other user characteristics that may impact interventions include illness burden, competing demands, experience using computers, and ability [48]. Older age was not always a barrier to use [42]. This is encouraging and may be due to increases in the use of electronic devices in this group [49]. Some other recent reviews have concluded that online interventions are likely to have potential in an older population [50-52].

Unsurprisingly, a range of positive outcomes including adherence, engagement, feasibility, and satisfaction appeared to be related to easy to use, interesting, informative, and comprehensible interventions. However, it is not always easy to tell from the outset whether a prototype intervention will be perceived by patients as providing these features. Participant feedback facilitated the development and refinement of some interventions in the current review. User-centred approaches (such as The Person-Based Approach) can help intervention developers to identify intervention features which are likely to be most acceptable and persuasive to users [53]. It is unclear whether social networking features provide any added benefit. Online interventions are likely to function effectively without social networking components and with relatively little input from researchers or clinical staff[54].

It was also clear that in interventions for cancer survivors, particular behaviour change strategies were more successfully implemented than others. Recent reviews have suggested that self-monitoring of behaviour, planning, goal setting and review, and feedback on performance are associated with increased effectiveness in behaviour change interventions [55-57]. In our review, self-monitoring enabled participants to recognise symptom patterns, but could be difficult to incorporate into routines. Likewise, action planning was associated with positive behaviour change in many cases, but failing to complete action plans could have deleterious consequences [58]. The selection of techniques to change behaviours should be appropriate to the characteristics of those participating in the trial, in order to avoid causing inadvertent harm [59]. An unexpected benefit of this review was that by combining data from a number of early studies it was possible to collate information about rare but potentially important potential for negative consequences for some users, which is particularly valuable for intervention design.

Strengths and limitations

A limitation of this analysis is that the findings are largely descriptive due to the exploratory nature of this method, and the limitations of the data. It was not always possible to ascertain a complete picture of the intervention design process (particularly, how the content was developed), and some studies did not provide details of limitations and challenges faced throughout the trial process. Although we proposed an elementary model broadly linking the intervention characteristics to outcomes, we were unable to generate hypotheses about exactly how different intervention characteristics might influence different outcomes, as only

partial data was available for each intervention characteristic and outcome. A further limitation of the data was that individuals with particular characteristics (i.e. in a relationship, middle aged, Caucasian, and female) were overrepresented in most of the studies, limiting the ability to establish external validity [48]. Developers must therefore be aware that it is unclear if specific subgroups would benefit from online interventions (specifically socioeconomically disadvantaged groups, low-health literacy groups, and ethnic minorities), which may impact the validity of any findings [60]. Recruitment of heterogeneous samples and analysis of usage patterns to better contextualise findings is recommended.

A strength of our method is that we were able to integrate data from a variety of study designs at an early stage of development of the literature in this field. The inclusion of both individual author and participant interpretations allowed us to go beyond intervention descriptions and explore real-world experiences of online interventions for cancer survivors [17].

Conclusions

The common themes identified across the very different types of study and intervention confirm that thematic synthesis of a variety of study designs can inform the development of interventions when there is limited definitive trial evidence available. The method of synthesising early stage research described in this paper may enable researchers to generate useful hypotheses about why interventions work or do not work as intended. This method may well have application in other areas, beyond cancer survivorship.

Implications for cancer survivors

The findings from this analysis provide detailed insights into factors that may influence the uptake, acceptability, feasibility, adherence, attrition and positive behaviour change in online interventions for cancer survivors. They also highlight numerous specific issues for consideration when designing online interventions for this group. In general, it appears important to ensure that both the content and the timing of interventions is appropriate to the particular and changing support needs of cancer survivors. Behaviour change techniques also need to be carefully designed to match users' needs and capabilities, in order to avoid the potential for inadvertent negative consequences for some users. To minimise barriers to use, digital interventions must also be convenient and easy to use. User involvement in and feedback on the intervention during development may help to ensure that it is accessible, usable and appropriate.

Compliance with Ethical Standards:

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Table 1. Inclusion and Exclusion Criteria of Studies in Review

<i>Inclusion criteria</i>	<i>Exclusion criteria</i>
i) Papers describing interventions designed to improve quality of life and related outcomes in adults who have completed primary treatment for cancer. Interventions must be generalizable to breast, colorectal or prostate cancer survivors. ;	i) Papers analysing online forum groups and interventions delivered solely via social media websites (e.g. Facebook etc.);
ii) Studies describing people's experiences, views, and perceptions of usability and/or acceptability data of interventions.	ii) Interventions delivered offline; iii) Interventions designed to treat specific target groups that were not generalizable to breast, colorectal or prostate cancer survivors (e.g. pediatric samples, rare cancers, metastatic cancers etc.); iv) Interventions which took place during primary treatment.

Table 2. Quality Assessment of Included Studies

Study Quality	ST	Wsdei	STRIDE	BREATH	HN	PERC	KNW	RESTORE	Oncowijzer
Methods, designs, and study conduct	++	++	++	++	-	++	-	++	+
Quality of data/effects achieved	++	++	+	+	+	++	+	+	+
Relevance	++	++	- -*	++	+	++	++	++	++
Overall study quality	++	++	+	++	-	++	+	++	+
Notes:	- - = very low		- = low	+	= medium	++ = high	*very specific population		
	ST: <i>Survive and Thrive</i>			HN: <i>Health Navigation</i>					

Figure 1 PRISMA Flow Diagram

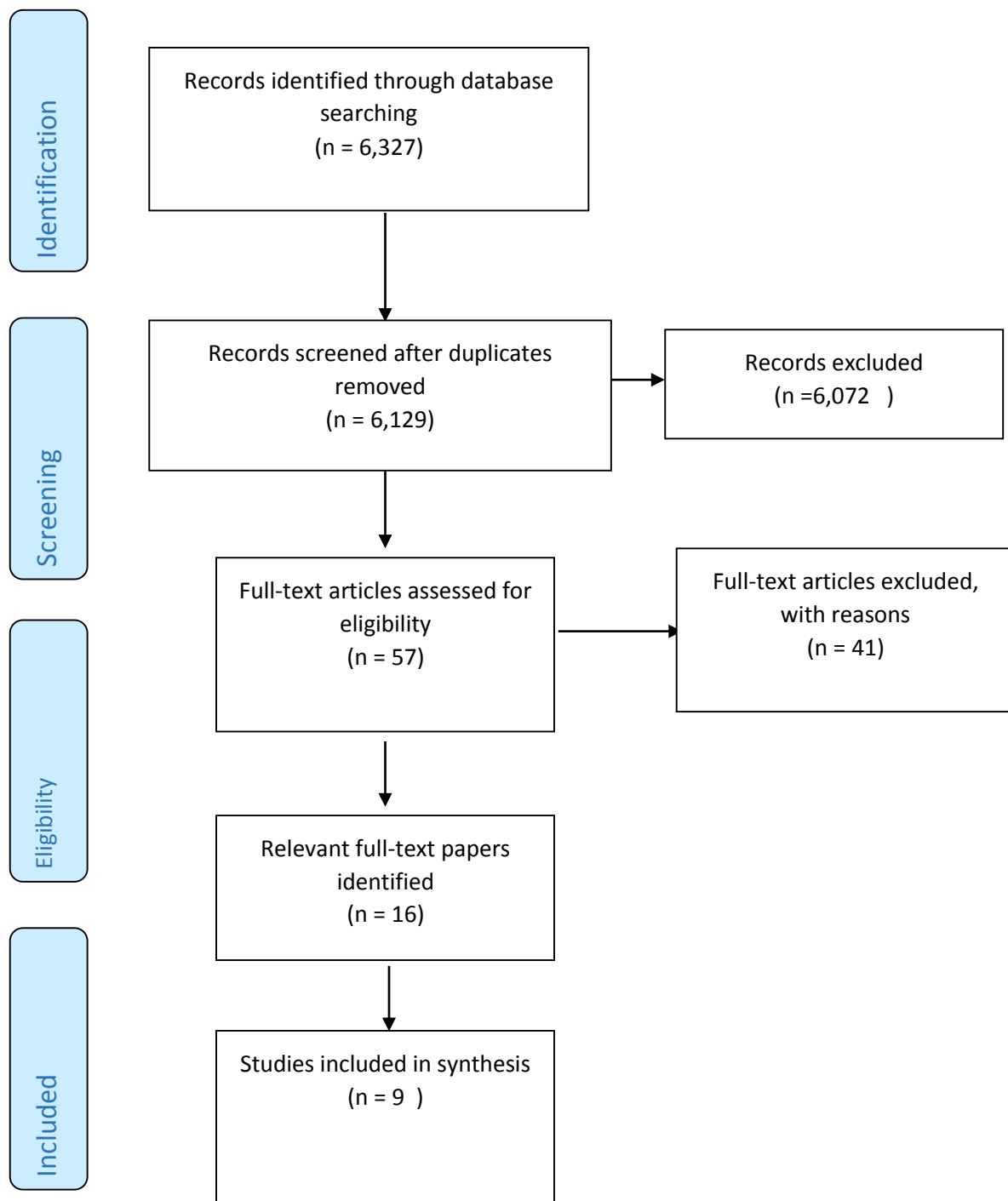
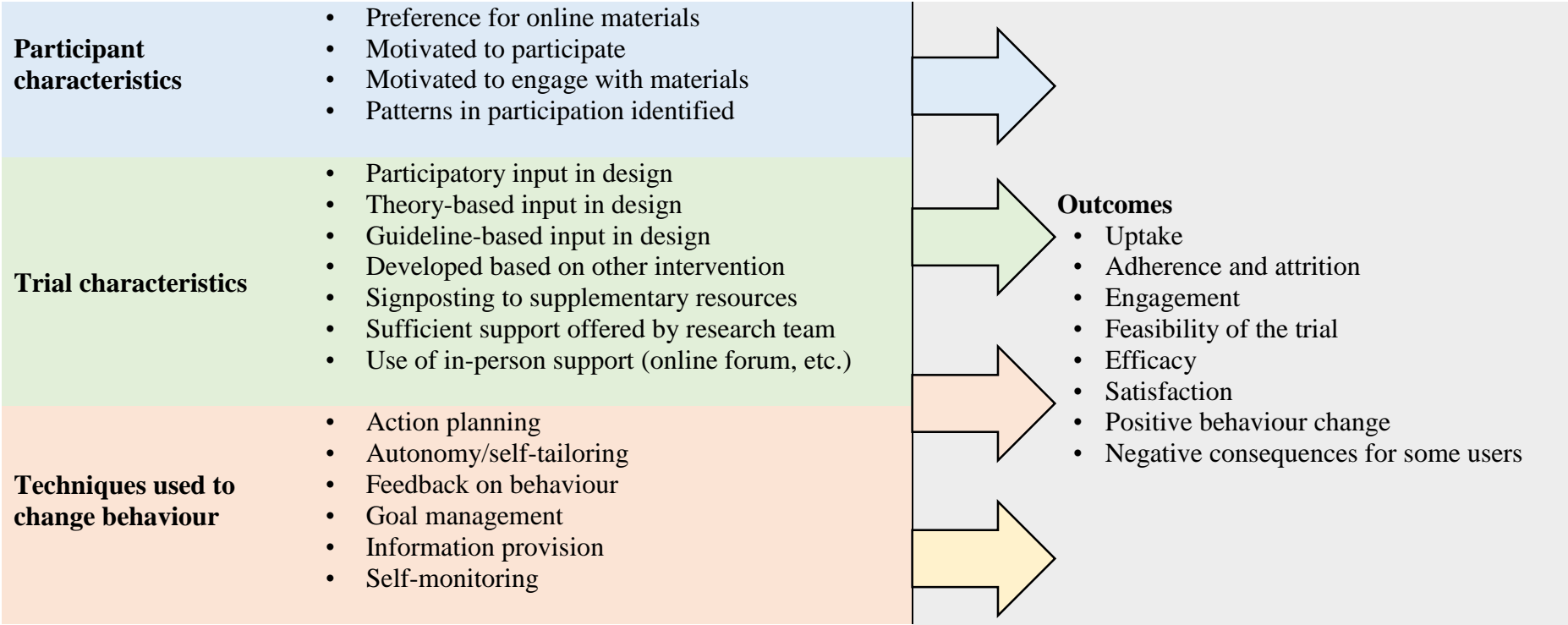


Table 3. Trial Details

Trial name	<i>Cancer type</i>	<i>Intervention target</i>	<i>Year</i>	<i>Country</i>	<i>Study type</i>	<i>N</i>
Survive and Thrive	Breast, ovarian, uterine, non-Hodgkin's lymphoma, colorectal, lung, thyroid, oral.	Encourage changes in health behaviours post-treatment (including: dieting, exercise, depression, and fatigue).	2015	USA	Randomized controlled trial.	352
					Exploratory analyses of engagement.	20
WSDEI (Health planner)	Breast.	Promote positive dietary and exercise change post-treatment.	2014	South Korea	Pilot randomized controlled trial.	59
STRIDE	Breast, prostate, non-Hodgkin's lymphoma.	Increase walking/physical activity.	2014	Australia	Qualitative pilot feasibility study.	8
BREATH	Breast.	Support psychological adjustment post-treatment; reduce stress and improve empowerment.	2015	Netherlands	Multi-centre randomized controlled trial.	150
					Sub-study analysis of usage.	70
Health Navigation	Breast, colon, stomach, lung, uterine, thyroid.	Online tailored education program for managing/ reducing cancer related fatigue.	2012	South Korea	Randomized controlled trial.	273
PERC	Prostate.	Online education and resources aimed to increase QoL for patients (e.g. symptom management etc.) and partners (increase communication etc.).	2015	USA	Mixed methods feasibility and acceptability pilot study.	26
Kanker Nazorg Wijzer	Unspecified (any cancer type accepted).	Improve self-management of lifestyle (e.g. physical activity, diet, and smoking), and psychosocial challenges post-treatment	2016	Netherlands	Randomized controlled trial.	432
RESTORE	Breast, colorectal, head/neck, liver, and prostate.	Reducing cancer-related fatigue, increasing self-efficacy.	2016	UK	Multi-centre proof of concept randomised controlled trial.	163
					Qualitative process evaluation.	19

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Oncowijzer	Breast.	Provide information for survivors (various issues; physical, psychological, work/social etc.); and partners (e.g. relationships, care giving etc.).	2014	Belgium	Design and process evaluation.	134
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Preferred features of online interventions	<ul style="list-style-type: none"> • Convenient and readily available • Ease of participation/easy to use • Layout/content style rated positively 	
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Figure 2. Depiction of analytical themes and the descriptive themes from which they emerged, and their relationship with the pre-specified outcomes

STUDY AUTHOR	TRIAL NAME	YEAR	COUNTR Y	FULL REFERENCE FOR TRIAL PAPER	OTHER PAPERS	TRIAL REGIST RATION
Foster	RESTORE	2016	UK	Foster, Grimmer, C., et al. (2013). "RESTORE: an exploratory trial of an online intervention to enhance self-efficacy to manage problems associated with cancer-related fatigue following primary cancer treatment: study protocol for a randomized controlled trial." Trials. 14.	1. Protocol Grimmett C, Armes J, Breckons M, Calman L, Corner J, Fenlon D, Hulme C, May CM, May CR, Ream E, Richardson A, Smith PW, Yardley L, Foster C, RESTORE: an exploratory trial of an online intervention to enhance self-efficacy to manage problems associated with cancer-related fatigue following primary cancer treatment: study protocol for a randomized controlled trial., Trials, 2013, 14, 184, doi: 10.1186/1745-6215-14-184. (http://www.ncbi.nlm.nih.gov/pubmed/23786716) 2. Results Myall M, May CR, Grimmer C, May CM, Calman L, Richardson A, Foster CL, RESTORE: an exploratory trial of a web-based intervention to enhance self-management of cancer-related fatigue: findings from a qualitative process evaluation, BMC Med Inform Decis Mak, 2015, 15, 1, 94.2013	ISRCTN6 7521059
Frensham	STRIDE	2014	Australia	Frensham, L. J., et al. (2014). "The experiences of participants in an innovative online resource designed to increase regular walking among rural cancer survivors: a qualitative pilot feasibility study." Supportive Care in Cancer 22(7): 1923-1929.		
Lee	Wsdei (Health planner)	2014	South Korea	Lee, M. K., et al. (2014). "A Web-based self-management exercise and diet intervention for breast cancer survivors: pilot randomized controlled trial." International Journal of Nursing Studies 51(12): 1557-1567.		NCT0151 2069.
Pauwels	oncowijzer	2014	Belgium	Pauwels, E., et al. (2012). "Design and process evaluation of an informative	Pauwels E, De Bourdeaudhuij I, Charlier C, Lechner L, Van Hoof E: Psychosocial characteristics associated with	B6702009 6619

				website tailored to breast cancer survivors' and intimate partners' post-treatment care needs." BMC Research Notes 5: 548.	breast cancer survivors' intimate partners' needs for information and support after primary breast cancer treatment. J Psychosoc Oncol. 2012. Pauwels E, Charlier C, De Bourdeaudhuij I, Lechner L, Van Hoof E: Care needs after primary breast cancer treatment. Survivors' associated sociodemographic and medical characteristics. Psycho-Oncol 2011,
van den Berg	BREATH	2015	Netherlands	van den Berg, S. W., Gielissen, M. F., Custers, J. A., van der Graaf, W. T., Ottevanger, P. B., & Prins, J. B. (2015). BREATH: Web-Based Self-Management for Psychological Adjustment After Primary Breast Cancer—Results of a Multicenter Randomized Controlled Trial. Journal of Clinical Oncology, 33(25), 2763-2771 . (van den Berg, S. W., et al. (2012). "Rationale of the BREast cancer e-health [BREATH] multicentre randomised controlled trial: an internet-based self-management intervention to foster adjustment after curative breast cancer by decreasing distress and increasing empowerment." BMC Cancer 12: 394.)	
Willems	Kanker Nazorg Wijze	2016	Netherlands	Willems, R. A., Bolman, C. A., Mesters, I., Kanera, I. M., Beaulen, A. A., & Lechner, L. (2016). Short-term effectiveness of a web-based tailored intervention for cancer survivors on quality of life, anxiety, depression, and fatigue: randomized controlled trial. Psycho-Oncology.	.Willems, R. A., Bolman, C. A., Mesters, I., Kanera, I. M., Beaulen, A. A., & Lechner, L. (2015). The Kanker Nazorg Wijzer (Cancer Aftercare Guide) protocol: the systematic development of a web-based computer tailored intervention providing psychosocial and lifestyle support for cancer survivors. BMC cancer, 15(1), Willems RA, Bolman CAW, Mesters I, Kanera IM, Beaulen AAJM, Lechner L. Cancer survivors in the first year after treatment: the prevalence and correlates of unmet needs in different domains. Psychooncology. 2015. doi:10.1002/pon.3870. (2011). Kanker in Nederland tot

					2020: trends en prognoses [Cancer in the Netherlands up to 2020: trends and prognoses]. Amsterdam, KWF Kankerbestrijding http://www.kankernazorgwijzer.nl	
Yun	Health Navigation	2012	South Korea	Yun, Y. H., et al. (2012). "Web-based tailored education program for disease-free cancer survivors with cancer-related fatigue: a randomized controlled trial." J Clin Oncol 30.		NCT01228773.
Bantum	Survive and Thrive	2015	USA	Bantum, E. O., Albright, C. L., White, K. K., Berenberg, J. L., Layi, G., Ritter, P. L., ... & Lorig, K. (2013). Surviving and thriving with cancer using a Web-based health behavior change intervention: randomized controlled trial. <i>Journal of medical Internet research</i> , 16(2), e54-e54.	Chen, Z., et al. (2015). "Dissecting an online intervention for cancer survivors: four exploratory analyses of internet engagement and its effects on health status and health behaviors." Health Education & Behavior 42(1): 32-45.	NCT00962494
Song	PERC	2015	USA	Song, L. X., et al. (2015). "Improving Couples' Quality of Life Through a Web-Based Prostate Cancer Education Intervention." Oncology Nursing Forum 42(2): 183-192. Purpose/Objectives: To evaluate the feasibility and acceptability of a newly developed web-based, couple-oriented intervention called Prostate Cancer Education and Resources for Couples (PERC).		

TRIAL	RESEARCH QUESTIONS/AIM OF RESEARCH	INTERVENTION DETAILS
RESTORE	<p>Online intervention to enhance self-efficacy (confidence) to manage problems associated with cancer-related fatigue following primary cancer treatment.</p> <ul style="list-style-type: none"> • To test an online resource (RESTORE) with a focus on increasing confidence to manage cancer related fatigue for those people who use the internet, or are willing to use the internet. • To assess the effectiveness of RESTORE compared with the leaflet comparator. • To identify the costs (and cost savings) associated with RESTORE compared with the leaflet comparator. • To understand the work required for participants • To establish if the concept and theoretical foundations of the intervention were sound; • To identify barriers to integrating and embedding the intervention into everyday routines; • To ascertain whether and how implementation needed to be improved. 	<ul style="list-style-type: none"> • The Macmillan Cancer Backup leaflet, Coping with Fatigue informed the content of the RESTORE sessions. Information and components of the intervention were also informed by the available evidence of fatigue management in cancer survivors. • developed using LifeGuide, open source software • Patients have six weeks to complete the five sessions of RESTORE. Presented with sessions one and two (which are compulsory) at weekly intervals and can then choose from sessions three to five for the following three weeks. • Expected that each session will take approximately 30 minutes to complete • Participants are encouraged to monitor activity patterns and engage in regular physical activity; managing thoughts and feelings (draws on the principles of CBT). fatigue diary and assessment of fatigue during each session as a means of monitoring fatigue. Patient stories (as written text and video clips) to provide examples people affected by CRF. Automated tailored feedback based on goal related progress and change in fatigue levels from the previous week are included throughout and there are links to useful resources such as mindfulness and relaxation training, and where to access information regarding financial support. Take a break' buttons are available during each session, allowing participants to rest if necessary. Prompted by automated emails to complete sessions and outcomes measures • An expert design team supported the development of the RESTORE sessions.
STRIDE	<p>The aim of this study was to determine whether an online intervention designed to increase walking based on perceptual regulation and daily affective state was acceptable and</p>	<ul style="list-style-type: none"> • 6-week online walking intervention (Steps TowarD Improving Diet and Exercise— STRIDE) • Used an online step log where participants logged their steps, RPE during exercise and how they were feeling daily (affect). Data were used to determine individualised weekly step goals to increase walking. • Information session on active lifestyles and participants provided with a Yamax Digi-Walker SW 200 pedometer to monitor their steps. Familiarised with Borg's 6–20 RPE scale and were asked to walk at a

feasible among rural cancer survivors using in-depth one-on-one interviews.

moderate intensity (RPE of 11–13), the ‘bandwidth’ within which people have the most positive response to exercise. Used the pedometer to monitor their steps by recording their daily step counts onto the step log on the website.

- Step log page: graph of average weekly steps which provided feedback on progress throughout the program.
- Asked to rate their RPE after walking and their daily affect (how they were feeling at the beginning of each day) to create personalised target steps/day for each participant, which were emailed to them weekly. Step goals varied depending on their baseline steps and affective state—a goal for when the participant was feeling ‘bad’ (i.e. minus on the affect scale), ‘neutral’ and ‘good’. If participants did not meet the step goals set on most days of the previous week, the goals for the following week were not changed. If goals were met, then step goals for ‘neutral’ and ‘good’ were increased by 5–10 %.
- Other components designed to encourage physical activity, including a forum to share experiences and provided peer support. Forum served to address the barriers of isolation experienced by many rural residents. A virtual noticeboard provided space for community service providers to promote community activities as well as provide evidence-based guidance on lifestyle behaviours- increasing access to safe, supervised and socially focused activities for cancer survivors and family members.
- Information on healthy eating based on the Cancer Council Australia’s nutrition guidelines that support the recommendations in The Australian Guide to Healthy Eating were also provided.

Wsdei (Health planner)

- The purpose of the study was to develop a web-based, stage-matched Exercise and Diet Planning program and to examine effects of the program on implementation of exercise and diet, self-efficacy, HRQOL, fatigue, anxiety and depression among breast cancer survivors.
 - Hypotheses were following:
 - The intervention group will show
 - A more advanced stage of change for exercise and diet compared to survivors in the control group.
 - A higher proportion of attaining goal of exercise (or higher level of energy expenditure of aerobic
- a web-based, stage-matched Exercise and Diet Planning program
 - 12-week program, provides tailored information on the exercise and diet based on the stage of motivational readiness of TTM.
 - tailored according to the principal constructs of the TTM theory such as the stage of change, process of change, decisional balance, or self-efficacy.
 - designed to allow to plan a regular exercise of 12.5 MET per week and to recommend to eat number of portions from six food groups for balanced diet tailored to individual's BMI, ideal body weight, and calories needed per day. The control group received a 50-page educational booklet on exercise and diet. The basic content of the booklet was same as that of the WSEDI. (English name: Health Planner)
 - The intervention group members were encouraged to use WSEDI regularly (at least twice weekly) through automated SMS messages. Each participant was scheduled to be online for 5-10 minutes each week.
 - The WSEDI contained four portions including assessment, education (tailored information provision), action planning (goal setting, scheduling, keeping a diary), and automatic feedback.
 1. **Introduction** informed participants of the overall background for developing Health Planner, the usage of the program, and the importance of exercising regularly and eating properly in maintaining good health for cancer survivors.

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- exercise) compared to the control group.
 - A higher proportion of attaining goal of diet (or higher level of diet quality) compared to the control group.
 - A better HRQOL level compared to the control group.
 - A better self-efficacy level compared to the control group.
 - Lower fatigue level compared to the control group.
 - Less anxiety compared to the control group.
 - Less depression compared to the control group.
2. **Assessment** section allowed participants to input their physical activity level, body weight, and stage of motivational readiness. All participants were screened for any contraindications to exercise using the physical activity readiness questionnaire during assessment. Using algorithms based on input data, each patient could access tailored information appropriate to each stage of change, and was prescribed the appropriate number of portions of 6 food groups given their physical activity level and body mass index (BMI, measured on a daily basis).
 3. **Education** content was divided into 5 modules based on the current stage of motivational readiness of each patient through assessment. For patients in the precontemplation stage, education focused on raising consciousness, dramatic relief, environmental reevaluation, and increasing the number of pros. For patients in the contemplation stage, education focused on self-reevaluation, increasing the number of pros, decreasing the number of cons, and building self-efficacy. For patients in the preparation stage, education focused on self-liberation, and remembering and increasing the number of pros. For patients in the action and maintenance stages, education focused on reinforcement, assisting with relationships, counter-conditioning, stimulus control, and management of temptation.
 4. **Action Planning** included setting a recommended goal, planning, keeping a diary, and comparing between current and recommended levels of exercise and diet. Each participant was encouraged to actively plan their exercise behavior in line with the American Cancer Society (ACS) guidelines for cancer survivors and to achieve an excellent dietary score (measured using the Korean version of the Diet Quality Index). The details of exercise and diet planning delivered via Health Planner are as follows.
 5. **Exercise Planning:** The goal of exercising was to perform at least moderate-intensity aerobic exercise for at least 30 minutes on at least 5 days each week (to yield 12.5 metabolic equivalents of energy expenditure, in line with ACS guidelines for cancer survivors). Health Planner generated a tailored plan for each participant through assessment. If a patient had no history of exercise prior to cancer treatment, exercise was gradually introduced. Planning regular exercise was set to start at the preparation stage. The exercise was to be aerobic in nature, and the specific type of exercise was based on individual patient preference. The type, intensity, duration, and frequency of exercise could be self-adjusted as necessary depending on patient age, history of exercise, and subjective experience of tiredness. Exercise plan was implemented as an event on a calendar.
 6. **Dietary Planning** to achieve an excellent dietary quality score (measured using the Diet Quality Index). The aims included an energy level derived from fat of $\leq 20\%$, an energy level derived from saturated fat of $\leq 6\%$, cholesterol ≤ 300 mg/day, an energy level derived from carbohydrates of $\leq 65\%$, an intake of vegetables and fruit of ≥ 7 servings/day, a protein recommended dietary allowance of 75-125%; a calcium recommended dietary allowance of 75-125%; and a sodium intake of ≤ 3500 mg/day. Dietary planning was based on individual BMI values, ideal body weights, and daily calorific requirements. Each patient was educated in terms of the recommended daily number
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of portions from the 6 food groups (grain, meat/fish/eggs/beans, vegetables, fruit, milk and dairy products, and fats and oils) as suggested by the Korean Nutrition Society (2010). All participants were encouraged to achieve a balanced diet. Participants recorded the daily number of portions of 6 food groups consumed in a dietary diary and daily exercise behavior (type, intensity, and duration) in an exercise diary. These data were used to give automatic feedback on progress toward goal attainment (the SMS module was employed toward this end). The data were also presented visually where a graph compared the actual amount of exercise done, dietary intake, and the behaviors to what were recommended.

7. Participants were asked to input, on a daily basis, the number of portions from the 6 food groups consumed and the details of their exercise behavior (type, intensity, and duration of exercise) as shown in the exercise and dietary diaries. This information was used to provide feedback on progress toward goal attainment in the SMS module. Comparisons of the daily number of portions from the 6 food groups consumed with the recommended number, and of the weekly energy expenditure on aerobic exercise with the exercise goal identified patients who attained goal behaviors. These patients were given immediate reinforcement via positive automated messaging. Patients who did not attain goal behavior were encouraged to restart active exercise or to increase their dietary efforts. Such patients were encouraged to increase their level of physical activity or to attain a balanced diet by increasing F&V intake or moving to a low-carbohydrate or low-fat diet.
8. Experts who had participated in the system design and development were contacted again and asked to advise on problems that arose in terms of usability and content accuracy during system operation.
 - confusing array of content was rearranged to ensure consistency and relevance. Input speed was improved.
 - functions (ie, keeping a diary, setting a weekly exercise goal, measuring weekly body weight for a revised diet prescription, measuring the stage of change, SMS-based feedback) that depend on the stage of change and timing were modified to activate at an appropriate stage or timing.
 - Images of various food servings were added and an example of the written 3-day dietary recall report was included.
 - Number of pop-ups (negatively affecting concentration) was reduced.
 - Tasks that were shown as incomplete on the calendar were identified.
 - An SMS alarm was added to inform patients of the weekday on which education would be given. In addition, various bugs and errors were corrected.

Oncowijzer	The present study describes the development and the process	• The informative website (www.oncowijzer.be) consists of two major sections, providing information for breast cancer survivors on one part and focusing on intimate partners in the other section. The menus and
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evaluation of an informative website tailored to the care needs of breast cancer survivors and partners during the transition into survivorship. Furthermore, this study intends to determine which sociodemographic, medical, and psychosocial characteristics of survivors and partners are associated with the use of the website

subsections of the website are based on both qualitative and quantitative research of the specific needs of survivors and partners

- The focus of the website on the period after breast cancer treatment is emphasized on the homepage. A button was provided on the homepage for people who are still receiving treatment. Upon clicking on this button, links are provided towards other cancer websites.
- The novelty of the website's lay-out lies in its supply of information fitted to individual visitors' needs. Searching for relevant topics within a profusion of information is prevented by allowing visitors to select themes that concern them from on-line lists. The choice for these topics was also based on elaborate needs assessment of the target population.
- Depending on the menu chosen by the visitor (e.g. the Physical consequences menu), the menu's subsections (e.g. fatigue, pain, hot flashes, etc.) are presented as a list in which visitors need to tick the topics about which they would like to receive more information
- The content is tailored to the selection made by each visitor, providing them with a personally composed information package (e.g. merely providing information on fatigue, weight gain and lymphedema) no further navigation across the website's pages is required.
- clear-cut lay-out by drastic restriction of the number of buttons per page. The first page of the survivor section contains only 7 buttons matching the main menus, accompanied by a short description.
- Clicking on one of the complaints on the left displays advice. The advice buttons are sliding buttons, which can only be consulted one after the other. That way, the amount of information appearing at the same time on the visitors' screen is limited. No personal information package can be composed on the My complaints. These menus contain only 3 subsections, which are immediately presented as 'sliding' buttons on the menu page, requiring no further navigation.
- website contains an 'about us' button that provides information about the research team that developed the website and about the website's goal. An 'instructions for use' button, containing directions on how to navigate the website, was added for people who are not acquainted with the Internet.

BREATH

the aim of the BREATH intervention is twofold: decreasing psychological distress and increasing psychological empowerment, which reflects the individual outcome measure of a patients' intrapersonal and interpersonal strengths. The primary objective of this randomised controlled trial (RCT) is whether the BREATH intervention is effective compared to usual care in fostering

- The BREAsT cancer e-health [BREATH] intervention ('Catching your breath after breast cancer') is a nonguided Internet-based self-management intervention that uses CBT techniques and guides BCS chronologically through the transition from 'breast cancer patient' to 'survivor'. BCS will learn how to use CBT techniques as selfmanagement skills in their daily lives.
- Self-management program based on CBT containing components such as psychoeducation, cognitive reframing, goal planning and process evaluation.
- fixed content and structure, because it is assumed that "effective self-managers will feel confident in selecting the techniques(s) that they believe will meet their specific needs at a given point of time and in a given environment or situation"

adjustment after curative breast cancer treatment by reducing psychological distress and improving empowerment in BCS. Because BSC with and without elevated levels of psychological distress are included it is hypothesized that through using the BREATH intervention:

- 1) distressed BCS will experience a decrease in psychological distress,
- 2) non-distressed BCS will maintain a low level of distress, and/or
- 3) both distressed and non-distressed BCS will increase in empowerment.

- Preventive, early intervention program that is available to all BCS and does not require screening. The protocol has a fixed structure that covers four months, representing four different phases of recovery after breast cancer:
 1. Looking back [‘Terugkijken’],
 2. Emotional Processing [‘Verwerken’],
 3. Strengthening [‘Versterken’], and
 4. Looking ahead [‘Vooruit kijken’].
- These four phases are visually recognizable on the homepage of the intervention. Each phase equals one month and has a fixed structure that covers four weeks, targeting consecutively psychoeducation, problems in everyday life, social environment, and empowerment. Universal re-entry topics for recovery after curative breast cancer treatment are organized within the fixed structure of the 16-week intervention
- At the start of the intervention, only the first week is available. A welcome page opens automatically with a demonstration video to secure basic knowledge of intervention functionality. The demonstration video stays available in the library of the intervention.
- During the course of the intervention, every week new information is unlocked and available to patients. The prescribed use of the intervention is one hour per week, which is a total exposure of 16 hours during the course of the four months of the intervention. No conditions are attached to the use or the time investment of the intervention.
- Each week overview is filled with working ingredients surrounding a re-entry topic. Working ingredients include:
 - Information (25 scripts), A library with background information, a personal notebook and a mailbox for technical assistance. Being a self-management program, the focus of the multi-modal intervention is on the information and the assignments.
 - Assignment (total 48 tasks), (writing tasks, social engagement or conversation tasks and aim to increase skill-building)
 - Assessment (total 10 tests) - to be used by the patient as a screening instrument of potential problems.- on topics concerning depressive mood after breast cancer treatment, fear of recurrence, and posttreatment fatigue. followed by automated feedback using a traffic light model (green-orange-red), with red illustrating elevated symptoms including the advice to contact a professional.
 - Video (39 clips). -extracted clips from recorded interviews with three women who completed curative breast cancer treatment. The women in these peer modelling videos are of different ages and social backgrounds to increase recognition and empathy of the heterogeneous group of BCS.
- Support: fully-automated and nonguided and is delivered without professional support of a therapist. Human support is only available for technical assistance by the researcher. Through email, the

		<p>researcher can be contacted and availability of this support is only during work-week and hours (Monday-Friday/ 9 am-6 pm).</p> <ul style="list-style-type: none"> • Every week and on pre-specified times, standardized emails are sent to intervention users as a reminder that they have access to a new week of information. These support emails intend to reduce attrition by reminding users to return to and use the BREATH intervention
Kanker Nazorg Wijze	<p>Assessed the effects of the KNW on lifestyle outcomes (PA, diet, and smoking) 6 months after getting access to the intervention, among cancer survivors who recently completed primary cancer treatment. First, we assessed whether having access to the KNW may improve PA, diet behavior (fruit, vegetable, whole grain bread, and fish consumption), and can lead to a higher rate of quitters among smokers in comparison to a usual care control group. Second, we explored the effects of following the module Diet on diet outcomes specifically and the effects of following the module PA on PA outcomes.</p>	<ul style="list-style-type: none"> • The KNW (http://www.kankernazorgwijzer.nl) covers seven self-management training modules. • Based on their screening questionnaire answers, participants receive personal advice about which modules deserves their further attention. For this, a thermometer is used as visual aid. “Green” advice indicates that the participant is doing well in this area and visiting the corresponding module is not necessary. “Orange” advice indicates that the participant is doing reasonably well, but there still is room for improvement. “Red” advice indicates that the participant is strongly advised to visit the corresponding module. • The information within the KNW is tailored to personal characteristics (gender, age, marital status, children, educational level), cancer-related issues (type of cancer, type, and number of comorbidities), motivational determinants (attitude, self-efficacy, and intention), and current behavior (e.g., lifestyle). • Modules Fatigue, Return to Work, Mood (i.e. anxiety and depression), and Relationships mainly cover psychosocial and mental health related issues, while the modules Physical Activity, Diet, and Smoking cover lifestyle-related issues. • Participants identify their problem, select a goal and receive psycho-education and assignments on how to deal with their problem, and personalize their goal through action plans. After thirty days, participants are invited for a second session in which they can evaluate the progress of their goal. If successful, participants are encouraged to maintain their behaviour. Otherwise, participants are encouraged to try again, try another solution, or adjust their goal and receive additional advice on how to deal with difficult situations. All modules provide links to other relevant and reliable websites • An additional module covering residual symptoms from cancer treatment was added to the KNW. General information is given on the most common physical complaints experienced after primary treatment, tips are given on how to deal with these symptoms, and advice is given to seek medical assistance for more information or help. • To keep participants involved in the program several types of e-mails were sent. <ul style="list-style-type: none"> ○ reminder e-mails when they completed the screening questionnaire but did not visit any of the modules. ○ e-mail to invite them to the second session of a module. ○ a postcard in spring wishing them Happy Easter and an eCard around the Holidays wishing them Happy Holidays.

- monthly news items were placed on the website in which professionals from different fields talk about cancer recovery.
- an invitation e-mail to see the latest news item.
- Other website elements
 - Personal page. On the Personal Page participants can find an overview of the personal advice they received from the screening questionnaire and the modules. Also contains a few instructional videos on how to use the KNW.
 - Video material. There are four types of videos implemented.
 1. Instructional videos explain what participants can expect from the KNW and how they should navigate the program.
 2. videos of fellow survivors were included for which we interviewed eight cancer survivors who were further along in their recovery process and willing to share their experiences of their life after cancer treatment and give advice to deal with certain issues.
 3. Videos of professionals were included for which we interviewed a sexologist and two clinical psychologists. These professionals give psychoeducation and advice from clinical practice.
 4. Monthly news items provided participants with extra information on specific areas. keep the participants involved in the KNW by referring them to the module that is related to the topic discussed in the news item
 - Forum. The KNW has a forum where fellow survivors can meet and ask each other or members of the KNW team questions. Participants are kept anonymous and the KNW team monitors the forum to control for advice contradicting the advice given in the modules.

Health Navigation	<p>The objective of this study is</p> <ol style="list-style-type: none"> 1. To develop a web-based, tailored program for Cancer-related fatigue in cancer survivors, which is comprehensive and evidence-based, 2. To evaluate the efficacy for cancer-related fatigue as a result of participating in the Web based, tailored program (Health Navigation®) for 12 weeks 3. to evaluate the efficacy for quality of life, fatigue-related behavior, satisfaction with the treatment as a result of participating in the Web 	<ul style="list-style-type: none"> ● Health Navigation is based on 5 concepts —comprehensive service, tailored service, continuous service, community or family based service, and humaneness. The program covers 6 strategic areas in the NCCN guidelines (energy conservation, physical activity, nutrition, sleep hygiene, pain control, and distress management). General area to introduce CRF, and participants evaluate their latest fatigue by themselves. ● Consists of both personally tailored sections based on TTM (exercise, sleep disturbance management, and pain control) and general education sections based on CBT (fatigue, energy conservation, nutrition, and distress management). ● Subjects in the intervention group are encouraged to participate in the program regularly. ● The program uses the following techniques: <ol style="list-style-type: none"> 1. Self-assessment and graphic reports. Data collection. Results are processed immediately with graphs that compare the patients' status with the general population's, which helps the patient
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based, tailored program(health navigation®) for 12 weeks
4. to assess the efficacy of such intervention compared with usual care in cancer survivors

- plan to improve CRF. As the subject progresses, the changes in stage of readiness are regularly checked and reported with graphs that chart behavioral change over time.
2. Online education: Each section has subsections, and the initial status of exercise, sleep disturbance management, and pain control sections is separately determined since Health Navigation automatically recognizes TTM status from the baseline survey results. The subjects are asked to participate in the Fatigue and Energy conservation sections first so that strategies for overcoming CRF can be tailored to their present status. They then can choose the sections they want to participate in according to the tailored strategies. based on transtheoretical model (TTM) of health behavior change and on social cognitive theory as the developed by Bandura or on cognitive behavior therapy (CBT)
3. Health advice. Health Navigation has two Web pages—a user’s page and an administrator’s page. The user’s page contains 7 intervention areas, and the administrator’s contains monitoring sources for participants. The two are connected, so the medical team (doctors and coordinators) can check the patient’s health status and monitor the process.
4. Enhanced and short message services are provided throughout the intervention as reminders and selfmonitoring tools. Tailored progress reports are sent weekly via e-mail to encourage continued participation. Text messages that include a summary of the preceding session are also provided for the same purpose.
5. Caregivers can log onto Health Navigation to monitor a subject’s progress, enabling them to provide encouragement or positive reinforcement.
6. Health professional monitoring of their participants on the administrator’s page. If a problem such as abnormal blood pressure or glucose level appears, a text message is automatically sent to the coordinator and a red alarm appears on the Web page. The intervention program is stopped until a coordinator figures out the problem and discusses it with the participant by telephone, ensuring the participant’s safety. If a problem is serious, the coordinator refers the participant to the health professional.

Survive and Thrive	<p>The STC trial tested the effectiveness of a tailored Web-based intervention to encourage multiple health behavior changes in post-treatment adult cancer survivors.</p> <p>We hypothesized that :</p> <ol style="list-style-type: none"> 1. participants in the STC treatment condition would show six-month improvements in psychosocial symptoms including fatigue, 	<ul style="list-style-type: none"> • The STC intervention was a six-week online workshop that was adapted from CDSMP, a patient education course adopting the underlying principle that people with similar health conditions can help each other improve their health behaviors. A Web-based version of CDSMP was adapted to be more relevant for cancer survivors. Modules on healthy eating were modified for cancer survivors living in Hawaii by adding foods that are commonly eaten in Hawaii, and modules on the changes in body, sleep, and other side effects associated with post-treatment recovery were added to the program. • aimed at helping to better manage own health and the demands as a result of cancer diagnosis. • To provide the skills needed to reduce stress and improve quality of life. If successful, the workshop can be made available to other cancer survivors.
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- insomnia, and depression, and would also report eating significantly more servings per day of fruits and vegetables when compared with participants in the waitlist control condition.
2. participants in STC would report significantly more minutes of physical activity per week compared to controls.
- Each cohort (group) consisted of approximately 20-25 survivors, with a total of nine cohorts. Each session of the six-week course included approximately 30-35 webpages of didactic material that is geared towards skills building, information about specific content, and the encouragement of weekly action plans to build self-efficacy.
 - Healthy eating
 - Managing fatigue
 - Managing stress
 - Starting and maintaining an appropriate physical activity program
 - Getting a good night's sleep
 - Dealing with difficult emotions
 - Solving the problems caused by having had cancer
 - Communicating better with your health care professionals
 - Communicating better with your friends, family and coworkers
 - At the end of each weekly educational session, users were invited to identify a health behavior they would like to change and were guided, in both the didactic materials, as well as by facilitators on how to set realistic, achievable goals, which were called action plans.
 - Participants were prompted both in the middle and at the end of a given week, via an automated message, to update the group on their progress as well as provide feedback to other group members.
 - Each group had two facilitators who were cancer survivors. The facilitators went through intensive online training about both the content of the intervention materials as well as how to respond to users' comments and goals. They were mentored by the principal investigators, who during the course of the intervention also read all posts and gave feedback and help to the facilitators as needed.
 - on at least 2-3 times each week for a total of 1-2 hours, to read the lessons, complete assignments, and share ideas and experiences with classmates. There are no requirements that participants log in at the same time.
 - The most crucial components were
 - The Discussion Center feature of the website is where social networking occurred and survivors were encouraged to provide feedback and encouragement to each other. This was accomplished in four threaded bulletin boards: action planning, problem solving, difficult emotions, and celebrations. Participants could post directly to any of the four bulletin boards at any time. Weekly action plans were posted on the "Discussion Center" and facilitators provided feedback and help.
 - The My Tools component of the program allowed participants to use tools (eg, exercise logs) to help continue to shape their behavior on an individual basis. They could also listen to relaxation exercises and find links to resources outside of this intervention.
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- The Post Office component allowed participants to message each other individually, including emailing the facilitators. While facilitators, mentors, and principal investigators had access to all posted messages, they were not specifically monitored as a way to ensure some level of confidentiality.
- In the Help component, participants could contact one of the website or study administrators for assistance, look over a tutorial of the website, and read the informed consent

PERC

the authors of the current article developed a couplefocused, web-based intervention for PCa symptom management called Prostate Cancer Education and Resources for Couples (PERC). PERC takes a supportive educational approach to helping couples work together to mitigate the impact of patients' symptoms after treatment for PCa, which may improve quality of life for patients and partners. This article describes the feasibility and acceptability results from initial evaluations of the PERC program in a pilot study of patients with localized PCa and their partners.

PERC was developed by a team of nurses, physicians, a psychologist, a media specialist, web designers, and programmers. intervention protocol was reviewed and informed by a panel of six urologic oncologists and three nurse practitioners at a university affiliated cancer hospital

It integrated two components:

1. the family involvement and symptom management modules from the FOCUS program, a theory-based, family-oriented intervention that explores family involvement, optimistic attitude, coping effectiveness, uncertainty reduction, and symptom management, and has been shown to improve quality of life among patients with PCa and their partners
 2. empirically based evidence and guidelines for symptom management (e.g., PCa survivorship care guidelines) (National Comprehensive Cancer Network [NCCN], 2014; NCCN & American Cancer Society, 2005; Skolarus et al., 2014).
- Various strategies were used to address the potential for low literacy among users:
 - audio-enhanced Microsoft PowerPoint® presentations and video clips to supplement text,
 - used plain language following guidelines at www.plainlanguage.gov to ensure an accessible reading level (i.e., sixth- to eighthgrade level, as evaluated with the SMOG Readability Formula)
 - content was developed with the goal of improving the information itself to capture readers' attention, ensuring that they find, understand, and use information of personal interest
 - The PERC website included seven education modules for couples to review; two modules were mandatory, and five modules were optional.
 - The mandatory modules provided information about how couples can work as a team (e.g., communication) and various survivorship issues (e.g., distress, relaxation, communication with healthcare team).
 - The optional modules focused on the management of PCa-specific symptoms (i.e., bowel, hormonal, sexual, and urinary issues) and general symptoms (e.g., fatigue, pain, sleep disturbance); couples chose modules to review according to the presence of symptoms in patients or partners.
 - The text and audio-enhanced slides contained the same information, allowing users to select their preferred medium for accessing it.

- Modules also included links to videos demonstrating relevant skills (e.g., Kegel exercises), and assignments were available to encourage couples to share personal experiences with symptoms and to collaboratively develop management strategies.
- PERC also provided a Prostate Cancer Resource Center with web links to different organizations and online resources.
- Each module provided 10–20 minutes of information; additional time was needed to complete assignments. Each couple was given a maximum of eight weeks to complete the modules; they were asked to complete one module each week or to complete the modules at their own pace.
- couples were encouraged to practice skills they learned from the module, discuss the symptoms and their positive and negative effects on their daily lives, and brainstorm strategies to minimize the negative effects. Couples were also encouraged to review modules and complete the assignments together, but they could choose to complete PERC individually.

REFERENCE NAME FOR STUDY	NUMBER OF PARTICIPANTS	NUMBER OF PARTICIPANTS	SAMPLE CHARACTERISTICS
RESTORE	163 participants were randomised, 85 allocated to RESTORE and 78 the leaflet. Nineteen of the 81 invited participants completed a process evaluation interview, 8 from RESTORE and 11 from the comparator group.	163 participants were randomised, 85 allocated to RESTORE and 78 the leaflet. Nineteen of the 81 invited participants completed a process evaluation interview, 8 from RESTORE and 11 from the comparator group.	<p>baseline characteristics were generally well-balanced between groups. intervention group had a higher proportion ‘not working’, primarily due to more retired people in this group, and a greater number of days since last cytotoxic treatment.</p> <p>Process evaluation: Most (n=15) were female and ≤60 years (n= 14, age range 39–78 years). A range of cancer types were represented; the majority (n=12) had breast cancer. Six in the RESTORE group had accessed ≥3 RESTORE sessions</p> <p>Gender, n (%) Male 37 (23.3) Female 122 (76.7)</p> <p>Age Range 29–80 Mean (SD) 57.8 (9.95)</p> <p>Ethnicity, n (%) White 156 (98.7) Non-white 2 (1.3)</p> <p>IMD index of multiple deprivation quintile (England only; n=140), n (%)</p> <ol style="list-style-type: none"> 1. (most deprived) 16 (11.4) 2. 23 (16.4)

3. 34 (24.3)
4. 34 (24.3)
5. 33 (23.6)
Employment status, n (%) Employed 90 (57.8)
Unemployed 67 (42.2)
Other long-term conditions, e.g. diabetes, asthma; n (%)
0 54 (34.0)
1 54 (34.0)
2 29 (18.2)
>2 22 (13.8)
Cancer type, n (%)
Breast 94 (59.1)
GI 25 (15.7)
Bladder/kidney 1 (0.6)
Gynaecological 8 (5.0)
Head and neck 15 (9.4)
Lung 2 (1.3)
Prostate 14 (8.8)
Treatment type, n (%)
Chemotherapy 110 (69.2)
Radiotherapy 109 (68.6)
Surgery 135 (84.9)
Hormone/endocrine 74 (46.5)
Time since diagnosis (days) 771 (569)
Time since last cytotoxic treatment (days) 531 (524)

STRIDE	Nine cancer survivors (seven females, two males) with a range of primary cancer sites participated in this study	Nine cancer survivors (seven females, two males) with a range of primary cancer sites participated in this study	Nine cancer survivors (seven females, two males) with a range of primary cancer sites participated in this study. One participant dropped out in the third week of the program for reasons unrelated to the study. Eight participants (six females, two males) completed the study and all were interviewed. The mean age of participants was 67.0 (SD 11.4) years with an age range of 43–78 years. All participants were Caucasian. Participants had been diagnosed with breast cancer (n=5), prostate cancer (n=1), non-Hodgkin's lymphoma (n=1) or bowel cancer (n=1). Education level ranged from 'completed primary school' to 'completed high school'. Six of the participants were married, one lived with a partner and one was widowed. All were retired except one who worked part-time. The length of time using the Internet ranged from 'first time' to 'seven or more years'.
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Wsdei (Health planner)	<p>59 women were randomly assigned to either the intervention (n = 30) or control (n = 29) group. 2 women (3%) dropped out and were lost to follow-up. The reasons for drop out included busyness (n = 1) and breast cancer recurrence (n = 1).</p> <p>The 12-week intervention course and follow-up were completed by 29 (96.7%) participants in the intervention group and 28 (96.6%) in the control group</p>	<p>59 women were randomly assigned to either the intervention (n = 30) or control (n = 29) group. 2 women (3%) dropped out and were lost to follow-up. The reasons for drop out included busyness (n = 1) and breast cancer recurrence (n = 1).</p> <p>The 12-week intervention course and follow-up were completed by 29 (96.7%) participants in the intervention group and 28 (96.6%) in the control group</p>	<p>Age, years, mean (SD):</p> <ul style="list-style-type: none"> INTERVENTION: 43.2 (5.1) CONTROL: 41.5 (6.3) <p>Educational level, n (%)</p> <ul style="list-style-type: none"> High school INTERVENTION: 9 (31.0) CONTROL: 7 (23.3) College or beyond INTERVENTION: 19 (69.0) CONTROL: 24 (76.7) <p>Marital status, n (%)</p> <ul style="list-style-type: none"> Married INTERVENTION: 24 (82.8) CONTROL: 27 (90.0) Not married INTERVENTION: 5 (17.2) CONTROL: 3 (10.0) <p>Time elapsed since treatment, days</p> <ul style="list-style-type: none"> Mean (SD) INTERVENTION: 156.6 (102.8) CONTROL: 161.6 (107.8) <p>Body mass index, n (%):</p> <ul style="list-style-type: none"> 18.5 kg/m², <23 kg/m² INTERVENTION: 16 (55.2) CONTROL: 20 (66.7) <18.5 kg/m², ≥ 23 kg/m² INTERVENTION: 13 (45.7) CONTROL: 10 (33.3) <p>Surgery type, n (%)</p> <p>Breast-conserving INTERVENTION: 23 (79.3) CONTROL: 20 (66.7)</p> <p>Mastectomy INTERVENTION: 6 (20.7) CONTROL: 10 (33.3)</p> <p>Receiving chemotherapy, n (%):</p> <ul style="list-style-type: none"> No INTERVENTION: 6 (20.7) CONTROL: 4 (13.3) Yes INTERVENTION: 23 (79.3) CONTROL: 26 (86.7) <p>Receiving radiotherapy, n (%):</p> <ul style="list-style-type: none"> No INTERVENTION: 4 (13.8) CONTROL: 3 (10.0) Yes INTERVENTION: 25 (86.2) CONTROL: 27 (90.0) <p>Clinical stage, n (%):</p> <ul style="list-style-type: none"> Stage INTERVENTION: 0 (0.0) CONTROL: 2 (6.7) Stage I INTERVENTION: 11 (37.9) CONTROL: 12 (40.0) Stage II INTERVENTION: 15 (51.7) CONTROL: 13 (43.3) Stage III INTERVENTION: 3 (10.3) CONTROL: 3 (10.0)
Oncowijzer	<p>the effective response rate was 49.1% and 34.1% among survivors (n=57) and partners (n=28) respectively. The post-measure was answered by 37</p>	<p>The effective response rate was 49.1% and 34.1% among survivors (n=57) and partners (n=28) respectively. The post-measure was answered by 37</p>	<ul style="list-style-type: none"> Age: 51.7 Marital state: Partner 75.4% Education: Primary/secondary school 51.8 % College graduates 48.2% Employment: Employed 28.1% and Unemployed/unable 71.9% Monthly net household income: ≥ € 1500 77.4 % <p>Medical characteristics</p> <ul style="list-style-type: none"> Weeks post-treat: 15.7 Surgery

	survivors (64.9% of the baseline sample) and 19 partners (67.9% of the baseline sample).	survivors (64.9% of the baseline sample) and 19 partners (67.9% of the baseline sample).	<ul style="list-style-type: none"> o Breast conserving surgery 59.6% o Mastectomy 40.4 % • Chemotherapy 71.9 % • Radiotherapy 86% • Immunotherapy 24.6% • Hormone therapy 80.7%
BREATH	final ITT sample of 150 BCSs (70 CAU BREATH, 80 CAU alone). Participants with missing data at T1 (n 17) had higher levels of baseline distress than participants with complete data at T1 (mean difference, 23.57; 95% CI, 3.82 to 43.31; P .02). Levels of baseline empowerment were similar (P .79). Missing data at T1 were equally distributed between the two groups. Overall, 124 participants (58 CAU BREATH; 66 CAU alone) completed all four assessments, and their data were included in follow-up analyses. No metastases or severe	final ITT sample of 150 BCSs (70 CAU BREATH, 80 CAU alone). Participants with missing data at T1 (n 17) had higher levels of baseline distress than participants with complete data at T1 (mean difference, 23.57; 95% CI, 3.82 to 43.31; P .02). Levels of baseline empowerment were similar (P .79). Missing data at T1 were equally distributed between the two groups. Overall, 124 participants (58 CAU BREATH; 66 CAU alone) completed all four assessments, and their data were included in follow-up analyses. No metastases or severe illnesses were	<p>At baseline, the two groups did not differ on demographic characteristics</p> <p>Age, years CAU _ BREATH Mean 51.44 SD 8.30 CAU alone Mean 50.18 SD 9.15</p> <p>Educational level_ Low (ISCED 0-1-2) CAU _ BREATH n= 14 /20% CAU alone n= 13 /16% Medium (ISCED 3-4-5) CAU _ BREATH n= 32 /46 % CAU alone n= 48 /60% High (ISCED 6-7-8) CAU _ BREATH n= 24 /34% CAU alone n= 19 /24%</p> <p>Marital status Married/cohabiting CAU _ BREATH n= 58 83% CAU alone n= 61/ 76% Unmarried CAU _ BREATH n= 5/ 7 % CAU alone n= 5 /6% Divorced CAU _ BREATH n= 5 /7% CAU alone n= 10 /13% Widowed CAU _ BREATH n= 2 /3% CAU alone n= 4 /5%</p> <p>Children (yes) CAU _ BREATH n= 61 /87% CAU alone n= 62/ 76%</p> <p>Employment† Paid work outside home CAU _ BREATH n= 30/ 43% CAU alone n= 32/40% Home management CAU _ BREATH n= 21 /30% CAU alone n= 18/ 23% Unemployed CAU _ BREATH n= 3/ 4% CAU alone n= 8/ 10% Sick leave CAU _ BREATH n= 30/ 43% CAU alone n= 42/ 53% Disability insurance act CAU _ BREATH 3/ 4% CAU alone n= 5 /6% Voluntary work CAU _ BREATH n= 7/ 10% CAU alone n= 4 /5% Student CAU _ BREATH n= 0/ 0% CAU alone n= 1 /1% Retired CAU _ BREATH n= 3/ 4% CAU alone n= 3/4%</p> <p>Treatment type</p>

	illnesses were reported during the study.	reported during the study.	<p>Surgery _ chemotherapy _ radiotherapy CAU _ BREATH n= 48/ 69 % CAU alone n= 56/ 70%</p> <p>Surgery _ chemotherapy CAU _ BREATH n= 19/ 27% CAU alone n= 22/ 28%</p> <p>Surgery _ radiotherapy CAU _ BREATH n= 3/ 4% CAU alone n= 2/ 2%</p> <p>Hormone therapy CAU _ BREATH n= 46/ 66% CAU alone n= 53/ 66%</p> <p>Low distress (GSI _ 0.57) CAU _ BREATH n= 51/ 73% CAU alone n= 55/ 69%</p> <p>Frequency of Internet use‡</p> <p>Daily CAU _ BREATH n= 24/ 59% CAU alone n= 38/ 73%</p> <p>2 to 4 times a week CAU _ BREATH n= 12/ 29% CAU alone n= 9/ 17%</p> <p>Weekly or less CAU _ BREATH n= 5/ 12% CAU alone n= 5/ 10%</p>
Kanker Nazorg Wijze	462 cancer survivors were included for analysis at baseline (IC n = 231, UC n =231), and 409 participants filled out the follow-up questionnaire (11.5 % dropout).	462 cancer survivors were included for analysis at baseline (IC n = 231, UC n =231), and 409 participants filled out the follow-up questionnaire (11.5 % dropout).	<p>Significant baseline differences between groups were type of treatment, and consumption of vegetable, whole grain bread, and fish. Dropout was higher in the IC (n =43, 18.6 %) than in the UC (n= 10, 4.3 %). Significant predictors for dropout were allocation to IC (B= 1.998, SE= .410; p = .000), male gender (B = 1.490, SE = .681, p = .029), lower modal income (B= 1.155, SE= .513; p = .025), lower vegetable consumption (B= -.008, SE= .003; p = .014), and higher fruit consumption (B= 0.374, SE= .153; p = .014). The IC participants, included into the complete cases analyses, followed on average 2.23 (SD= 1.58) KNW modules. The PA module was followed by 45 (24.73 %), and the module Diet was followed by 116 (61.70 %) of included IC participants. Within the module Diet, 41 (21.81 %) IC participants set a goal to increase their vegetable consumption, 24 (12.77 %) wanted to increase their fruit consumption, 22 (11.7 %) set a goal to increase their fish consumption, 43 (22.87 %) wanted to increase the intake of whole grains, and 10 (5.32 %) set no specific goal. About 80 % followed the module Diet and/or the PA module within 14 weeks after getting access to the KNW. The module Smoking was followed by 19 (10.1 %) of the IC participants included into the complete cases analyses. Almost 95 % of them followed this module within 15 weeks after getting access.</p>
Health Navigation	<p>The 12-week course was completed by 113 participants (83.1%) in the intervention group and 130 (94.9%) in the control group.</p> <p>Intervention arm (n = 136.. Completed n</p>	<p>The 12-week course was completed by 113 participants (83.1%) in the intervention group and 130 (94.9%) in the control group.</p> <p>Intervention arm (n = 136.. Completed n =</p>	<p>Female sex</p> <ul style="list-style-type: none"> • Intervention Arm n=100 (73.5%) • Control Arm n=99 (72.3%) <p>Age > 45 years</p> <ul style="list-style-type: none"> • Intervention Arm n=71 (52.2%) • Control Arm n=75 (54.7%) <p>High school or higher education</p> <ul style="list-style-type: none"> • Intervention Arm n=129 (94.9%) • Control Arm n=129 (94.2 %) <p>Married</p>

= 113)	113)	• Intervention Arm n=116 (85.3%)
• Lost to follow-up (n = 23)	• Lost to follow-up (n = 23)	• Control Arm n=118 (86.1%)
• Too busy(n = 7)	• Too busy(n = 7)	Monthly household income> \$2,000
• Withdrew(n = 11)	• Withdrew(n = 11)	• Intervention Arm n=101 (74.3%)
• Poor Internet use(n = 5)	• Poor Internet use(n = 5)	• Control Arm n=103 (75.2%)
		No. of comorbidities>1
		• Intervention Arm n=18 (13.3%)
		• Control Arm n=18 (13.2 %)
Delayed intervention arm (wait-listed observation) (n = 137.. completed = 130)	Delayed intervention arm (wait-listed observation) (n = 137.. completed = 130)	Cancer type
• Lost to follow-up(n = 7)	• Lost to follow-up(n = 7)	• Breast
• Too busy (n = 3)	• Too busy (n = 3)	o Intervention Arm n=52 (38.2%)
• Withdrew (n = 2)	• Withdrew (n = 2)	o Control Arm n=54 (39.4%)
• Metastasis (n = 2)	• Metastasis (n = 2)	• Stomach
		o Intervention Arm n= 29 (21.3%)
		o Control Arm n=26 (19.0%)
		• Colon
		o Intervention Arm n=17 (12.5%)
		o Control Arm n=19 (13.9%)
		• Uterine
		o Intervention Arm n=12 (8.8%)
		o Control Arm n=19 (13.9%)
		• Lung
		o Intervention Arm n=10 (7.4%)
		o Control Arm n=10 (7.3%)
		• Thyroid
		o Intervention Arm n=16 (11.8%)
		o Control Arm n=9 (6.6%)
		Cancer stage
		• Stage I
		o Intervention Arm n=80 (58.8%)
		o Control Arm n=65 (47.5%)
		• Stage II
		o Intervention Arm n=36 (26.5%)
		o Control Arm n=48 (35.0%)
		• Stage III

			o Intervention Arm n=20 (14.7%) o Control Arm n=24 (17.5%)
Survive and Thrive	352 people completed baseline measures, and 303 completed follow-up measures (n=156 in treatment condition; n=147 in control condition).	352 people completed baseline measures, and 303 completed follow-up measures (n=156 in treatment condition; n=147 in control condition).	60% (59.9%, 211/352) of the interested participants were recruited from online social networking sites, the rest were recruited from physician offices, a tumor registry attached to Tripler Army Medical Center, and a survivorship clinic on Oahu. less education (OR 0.84, 95% CI 0.75-0.95, per one year increase) and having long-term back pain (OR 2.31, 95% CI 1.13-4.75) was associated with dropout between baseline and 6 month follow-up. The majority of participants were Caucasian (87.2%, 307/352) and female (82.1%, 289/352), having a mean age of 51 years (SD 11.2) and mean education level of 16 years (SD 2.9); 47.4% (167/352) were diagnosed with breast cancer and another 12.8% (45/352) of participants were given either an ovarian or uterine cancer diagnosis. With the exception of age, no significant differences were found among the two groups.
PERC	22: Among 51 patients who were eligible, 25 were either not interested in the study or did not respond to the authors' follow-up correspondence via mail, email, or telephone calls. Therefore, 26 couples were recruited, producing a recruitment rate of 51%. Twenty-five couples (96%) completed PERC, and 22 completed the post intervention survey; the retention rate was 85%. Dropouts were	22: Among 51 patients who were eligible, 25 were either not interested in the study or did not respond to the authors' follow-up correspondence via mail, email, or telephone calls. Therefore, 26 couples were recruited, producing a recruitment rate of 51%. Twenty-five couples (96%) completed PERC, and 22 completed the postintervention survey; the retention rate was 85%. Dropouts were because of family	Age (years) 62.95 0(SD=8.22) Distance from home to hospital (miles) 81.56 (SD= 93.85) Length of relationship (years) 28.59 (SD=17.34) Time since diagnosis (months) 19.05 (SD=21.39) Education High school or less07 College 13 Graduate degree02 Family income (\$)a 30,000 or less04 30,001–50,00002 50,001–75,00007 75,001 or greater09 Health literacy level Never had problems 17 Have some problems05 Race Caucasian 16 African American6 Type of treatment Radiation therapy13 Surgery 9

because of family death (n = 1), family illness (n = 1), and loss to follow-up (n = 2). The final sample size for analysis was 22 couples.	death (n = 1), family illness (n = 1), and loss to follow-up (n = 2). The final sample size for analysis was 22 couples.
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TRIAL	METHODOLOGY / DATA COLLECTION	OUTCOMES	ANALYSIS
RESTORE	<ul style="list-style-type: none"> • mixed methods : Randomised; Interventional; Design type: Prevention, Process of Care • • During screening, date of birth, sex and cancer type were recorded • Completed baseline (T0) questionnaires online. • Information from clinical records included cancer diagnosis (date and type) and treatments received. • completed further questionnaires at 6 (T1) and 12 weeks (T2) post baseline. • Process evaluation interviews, conducted by telephone after T2 assessments, were recorded and transcribed verbatim. 	<ul style="list-style-type: none"> • Test the value (provide proof of concept') of the intervention • Demographic information: age, sex, ethnicity, marital status, educational status, accommodation type and postcode. • Clinical information: cancer diagnosis (date, type and stage) and treatments received. • Intervention adherence • Feasibility: recruitment rates, reasons for non-participation and attrition. • Acceptability was inferred by adherence with the intervention and questionnaire completion rates. • Primary outcome: Perceived Self- Efficacy for Fatigue Self-Management Instrument (PSEFSM) • Self-Efficacy for Managing Chronic Disease 6-item Scale • Quality of life will be measured by the Functional Assessment of Cancer Therapy - General (FACT-G) and Personal Wellbeing Index (PWI) • Depression : Patient Health Questionnaire (PHQ-9). • Fatigue: Brief Fatigue Inventory. • economic evaluation: items assessing health service use, caring responsibilities and improvements from a patient perspective 	<ul style="list-style-type: none"> • The potential for RESTORE to improve self-efficacy was examined by a mixed-effects model for fatigue self-efficacy with a random intercept for centre (to account for within centre correlation) and random coefficients for time (to account for within-person correlation). • The effect of group (comparator vs intervention) in this model was of primary interest. Missing data were handled using multiple imputation where appropriate. • Analyses were based on intention-to-treat. • Health economic analysis identified health care resource use across groups and is reported using descriptive statistics. • Multiple imputation was performed using Stata 12.1. • Predictive mean matching was used to ensure feasible values of the outcomes, with imputations drawn from the nearest three neighbours. • Inspection of histograms suggested observed and imputed values had similar distributions. • The intended analysis (between-group, repeated-measures model with random intercept for centre and random coefficients for time) could not be implemented due to failure of the model to converge; we believe the highly variable nature of how fatigue evolves over time in an individual is the reason for this. Instead, simpler mixed-effects models were used to assess the effect of the intervention on outcomes at T1 and T2 separately (controlling for baseline scores and with a random intercept for centre).
STRIDE	semi-structured face-to-face interviews were conducted by two trained research	<ul style="list-style-type: none"> • Acceptability and usefulness of the program, change in walking patterns, barriers faced, step goals, visual appeal and functionality of the 	<ul style="list-style-type: none"> • A qualitative descriptive design was used. Interviews were transcribed verbatim.

	<p>staff to assess the feasibility of the online resource.</p>	<p>website, and the participant's perspective on aspects of the program designed to increase daily steps.</p> <ul style="list-style-type: none"> • Sample questions ‘What did you like most/least about the STRIDE program?’, ‘How difficult/easy was it for you to reach your step goals?’ and ‘What did you think of the visual appeal of the website?’ <p>Probing questions were used when responses were dichotomous (i.e. yes/no) and more in-depth information was required. Interviews each lasted approximately 45 min.</p>	<ul style="list-style-type: none"> • coded all interviews thematically using NVivo10 qualitative analysis software. • All data were analysed using qualitative content analysis. Most thematic categories were labelled using descriptive terms within the narratives, while some were driven by questions in the interview guide. • The first level of coding identified the broad substantive content, for example, motivation to increase physical activity. • Subsequent levels of coding involved re-examining the content of these codes to identify commonalities and differences. • Categories describing comparable experiences were grouped together under a higher order concept, as recommended by Strauss and Corbin. • A second researcher reviewed and commented on the coding categories. Any discrepancies were resolved between the first and second authors. • Finally, the codes were grouped into categories and sub-categories and reviewed to identify overarching themes.
Wsdei (Health planner)	<ul style="list-style-type: none"> • Study Type: Interventional Study Design: Allocation: Randomized Endpoint Classification: Efficacy Study Intervention Model: Parallel Assignment Masking: Single Blind (Outcomes Assessor) Primary Purpose: Supportive Care • both the control and experimental groups were registered on the website • The baseline and 12-week follow-up measurements were collected via self-reported Web-based surveys. 	<ul style="list-style-type: none"> • Primary Outcome Measures: Change from baseline in numbers of goal behaviors at 3 months and after 12 weeks of intervention <ul style="list-style-type: none"> ○ exercising ≥ 12.5 kcal/kg/week ○ eating vegetables ≥ 5 serv/day and fruits 1-2 serv/day; iii) ○ healthy weight ($18.5 \text{ kg/m}^2 \leq \text{BMI} < 25 \text{ kg/m}^2$) ○ The primary outcome of the study is the increased number of goal behaviors. Secondary Outcome Measures: <ul style="list-style-type: none"> ○ Change from baseline in Stage of Change at 3 months 	<ul style="list-style-type: none"> • Characteristics of the intervention and control groups were described using frequencies and means, standard deviations, and ranges, for all variables. • The t-test for continuous variables and the Chi-square test for categorical variables were utilized to explore the homogeneity of baseline characteristics between the two groups • Between-group differences from baseline to 12-week point of the test were explored using an ordinal logistic regression model, adjusting for baseline values. • Group difference in the percentage of patients attaining goal behaviour, such as exercising at moderate intensity for at least 150 min a week and eating five servings of F&V a day, was tested with the logistic regression model.

- SMS messages reminded study members of upcoming assessment points and invited those members to access the web program.
- Stage of motivational readiness for exercise and diet based on the established TTM
 - Change from baseline in self-efficacy at 3
- The self-efficacy for exercising ≥ 12.5 kcal/kg/week, eating vegetables ≥ 5 serv/day and fruits 1-2 serv/day
- Change from baseline in psychosocial outcomes at 3 months: The psychosocial outcomes are HRQOL, Fatigue (BFId), anxiety and depression (PHQ)
 - Change from baseline in Diet quality at 3 months: Diet quality based on a three-day diet recall and the Diet Quality Index (DQI) revised for the Korean population
- Between-group differences from baseline to 12-week point in HRQOL, the levels of fatigue, anxiety, depression, and the continuous variables of DQI (Total calories from fat, SFA, and carbohydrate, and Cholesterol) were explored using an analysis of covariance (ANCOVA) after adjustment for baseline scores

Oncowijzer	<ul style="list-style-type: none"> • focus group interviews were conducted to determine survivors' and partners' points of view regarding the look and feel of an informative website intended to support post-treatment rehabilitation. A post-questionnaire was developed to evaluate the content and lay-out of the tailored website, based on concepts commonly accepted in literature on process evaluation of computer-tailored interventions • participants received a questionnaire assessing their sociodemographic, medical and psychosocial characteristics, acquaintance with the Internet, as well as their level of care needs. 	<ul style="list-style-type: none"> • process evaluation of computer-tailored interventions: questionnaire on content and lay-out of the tailored website: <ul style="list-style-type: none"> ○ To what extent the website was user-friendly, well built, interesting, informative, understandable, new, incomplete, irrelevant, unreliable, too extensive and confusing. ○ Participants' opinions about the website's topics, use of colors, images, the ability to select information of relevance and links to other websites. ○ Requested to rate the main menus of the website on a scale from 1 to 10. ○ Asked whether consultation of the website had led them to download or order brochures on other websites (yes/no) or to get to know other websites about cancer (yes/no). ○ Participants could write down remarks and suggestions for improvement of the website. ○ Participants who did not visit the website were 	<ul style="list-style-type: none"> • Process evaluation was analyzed using descriptive statistics. • Independent samples t-tests and chi-square tests were used to compare sociodemographic and medical characteristics, physical and psychosocial characteristics and care needs at baseline between survivors and partners who either or not visited the website. • comparisons were made between visitor and non-visitors in the website group regarding their acquaintance with the Internet. • Chisquare values of dichotomous variables were compared to the Yates' correction for continuity, which compensates for possible overestimation of the chi-square value for analysis with 2 dichotomous variables.
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- A post-questionnaire was developed to evaluate the content and lay-out of the tailored website
- asked to indicate why they had not consulted the on-line information.
- Information was also gathered about participants' use of the website by means of the website's tracking system.
 - participants' age, education, monthly net household income and employment.
 - Medical information was collected regarding the date and type of breast cancer treatments of the survivor (surgery, chemotherapy, radiotherapy, immunotherapy, hormonal therapy).
 - Physical and psychosocial variables assessed at baseline included participants' levels of
 - o anxiety (HADS),
 - o depression(HADS),
 - o self-esteem (RSE)
 - o illness representations (IPQ-R),
 - o social support (SSL-I),
 - o lack of social support (SSL-D)
 - o coping strategies (CISS)
 - physical side effects (EORTC-BR23)
 - o fatigue (FACIT-fatigue)
 - o body image (EORTC-BR23)
 - o future perspective (EORTC-BR23)
 - Partners answered additional questionnaires assessing their perceived stress (PSS) and self-efficacy (GSES)

BREATH	<ul style="list-style-type: none"> • non-blinded, multicentre randomised controlled, parallel-group trial evaluating the superiority of the BREATH intervention compared to usual care after primary curative breast cancer treatment. After completion of baseline measure, 	<ul style="list-style-type: none"> • Psychological distress will be assessed with the Symptom Checklist 90-items (SCL-90). • Psychological empowerment will be measured with the Cancer Empowerment Questionnaire (CEQ). • Anxiety and depressive states will be assessed with the Hospital Anxiety and Depression Scale (HADS) 	<ul style="list-style-type: none"> • The significance of intervention effects on primary and secondary outcomes was tested using one-way between-groups analyses of covariance with group (CAU BREATH or CAU alone) as a fixed factor. • Clinically significant change, assessed with the reliable change index (RCI) of the GSI, was tested in ITT analysis (T0 to T1). The magnitude of improvement (defined as RCI - 0.16 for lowdistress participants and RCI - 0.43 for
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<p>participants will be randomised to either intervention or control group.</p> <ul style="list-style-type: none"> • Baseline questionnaire • Follow-up measures are respectively months (T1; post-intervention), 6 months (T2), and 10 months (T3) after baseline. • Questionnaires are filled out online with Rad-Quest software • Participants will receive an invitational email with a link to complete the questionnaires. • Demographic characteristics gathered by self-report using questionnaires. • Information on diagnosis obtained from the patient's physician and medical record. 	<ul style="list-style-type: none"> • Quality of life related to breast cancer will be measured with the Dutch version of the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQC30) and Breast Cancer Module (QLQ-BR23) • General distress will be measured with the Dutch version of the Distress Thermometer (DT) • Illness perceptions will be assessed with the Illness Cognitions Questionnaire (ICQ) • Remoralization will be measured with the Remoralization Scale (RS) • Positive adjustment following breast cancer will be measured with the Positive Adjustment Questionnaire (PAQ) • Coping with the experience of breast cancer will be measured with the Dutch version of the Impact of Event Scale (IES) and the Brief COPE • Self-efficacy with regard to complaints (in this study as a result of breast cancer) will be measured with the Self- Efficacy Scale (SES) • Fear of cancer recurrence and the impact of cancer worries on daily life will be measured with the Dutch extended version of the Cancer Worry Scale (CWS) and the Cancer Acceptance Scale (CAS) • Fatigue will be measured with the fatigue severity subscale of the Checklist Individual Strength (CIS-fatigue) • Family communication about breast cancer will be measured with a modified version of the Openness to Discuss Hereditary Cancer in the Family (ODHCF) scale • Personality factors will be measured with the Dutch version of the Big Five Inventory (BFI) • costs of health care utilization will be collected 	<p>high-distress participants) or deterioration (RCI -0.16 for low-distress participants and RCI -0.43 for high-distress participants) was assessed using one-sided 2 tests.</p> <ul style="list-style-type: none"> • Follow-up effects for primary and secondary outcomes were evaluated with mixed within-between repeated-measures analysis of variance, including data for participants who completed all four assessments (T0 to T3). • Baseline variables were taken into account as within factors in the model. Differences between CAU BREATH and CAU alone were tested using independent samples t tests. • All statistical analyses were performed with SPSS 20 (IBM, Armonk, NY).
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through a modified version of the Trimbo/iMTA questionnaire for Costs associated with Psychiatric illness (TiC-P)

- medical disease-specific data
- question on breast-cancer specific Internet use will be listed.
- technical data on the use of the BREATH intervention will be collected in addition to the standardized questionnaires: Frequency and duration of logins, website activity, and other significant usage statistics will be evaluated

Kanker Nazorg Wijze	<ul style="list-style-type: none"> • (1) needs assessment of the study population: a literature study, focus group interviews, and a survey. (2) specification of performance objectives and crossing them with relevant determinants into change objectives (3) selecting theory informed intervention methods and practical applications to change the determinants of the health behavior, (feedback, personalizing risk, consciousness raising, belief selection, modeling, active learning, persuasive communication, argumentation, goal setting, action planning, and implementation intentions (4) producing and pretesting program materials: describing the program scope and sequence, preparing design documents, reviewing available materials, and developing and testing the program materials (5) planning program adoption implementation : 	<ul style="list-style-type: none"> • Short Questionnaire to Assess Health Enhancing Physical Activity (SQUASH) • 8 items of the Dutch Standard Questionnaire on Food Consumption were used at baseline and after 6 months • Dutch Measuring Instruments for Research on Smoking and Smoking Cessation were used to assess smoking behavior • Background information was collected at baseline using standard questions on age, gender, marital status, education level , income level, employment status, type of cancer, type of treatment, time since completion of primary treatment, aftercare, comorbidities, length and weight (body mass index [BMI]). • Mental Adjustment to Cancer Scale • The brief resilience scale • Hospital Anxiety and Depression Scale • CaSUN (Cancer Survivors' Unmet Needs measure • The Revised Illness Perception Questionnaire (IPQ-R). • Social Problem-Solving Inventory–Revised (SPSI–R). 	<ul style="list-style-type: none"> • Preparatory and descriptive analyses were conducted using SPSS 22, and for calculation of the intervention effects, STATA version 13.1 was applied. • Baseline differences between IC and UC concerning lifestyle behaviors, demographic and cancer-related characteristics were examined using independent t tests and chi-square tests. • Selective dropout was assessed by applying logistic regression analysis with dropout as outcome variable (0=no; 1=yes) and group assignment and baseline characteristics as predictive factors. • intervention effects at follow-up in PA and dietary behavior: multilevel linear regression analysis (MLA) was applied. A two-level data structure was use with individuals (level 1) nested within hospitals (level 2), taking the possible aftercare differences between hospitals into consideration because there might be interdependence between participants from the same hospital. • Model testing proceeded in two phases, the crude^ and adjusted^ analyses, in line with Twisk. The crude model was adjusted for standard demographic and disease-related characteristics, significant variables from dropout analysis, and baseline differences, i.e., gender, age,
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(6) planning for evaluation.

A randomized controlled trial was conducted to reveal effects between participants assigned to the intervention condition (IC) or the usual care control condition (UC). Randomized allocation (ratio of 1:1) was automatically performed by means of a digital randomizer after centralized registration of participants

- Screening questionnaire measuring several concepts, including fatigue, work limitations, psychological distress, social support, physical activity, food intake, and smoking behaviour.
- baseline and at the 6-month follow-up. Following specific modules” and the “number of weeks since first login” were derived from program logging data.

- European Organization for Research and Treatment of Cancer QLQ-C30
- “Following specific modules” and the “number of weeks since first login” were derived from program logging data.

marital status, education level, income level, employment status, BMI, type of cancer, having had cancer before, type of treatment, time since completion of primary cancer treatment, aftercare, comorbidities, vegetable, fruit, whole grain bread, and fish intake at baseline. These variables were added as fixed intercepts and dummy-coding was used for categorical variables including more than two categories.

- For testing the effect of following a specific module, intervention condition[^] was categorized into three categories (0=UC, 1 =IC, specific module not followed, 2= IC, specific module followed) in the fully adjusted MLA models.
- Analyzing the intervention effect on smoking behavior after 6 months by using multilevel logistic regression analysis was not possible due to the small number of smokers.
- Chisquare tests were applied to assess differences between IC and UC at baseline and follow-up.
- Cohen’s d effect sizes were calculated for the main effects results on PA and dietary behavior by dividing the difference between the relevant two means of IC en UC at follow-up by the pooled standard deviations of those means.
- For the sub-analysis of following modules (yes/no), Cohen’s d was adjusted for the baseline value by dividing the difference between the means of the relevant change scores by the pooled standard deviation of those means.
- Additionally, Cohen’s f² was calculated in order to evaluate the local effect size within the context of the fully adjusted MLA model with $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively. To index the magnitude of the effect for smoking, according to Durlak, the odds ratios (OR) were calculated by comparing the odds of smoking

- cessation for the intervention group with the odds of smoking cessation for the control group.
- only those respondents, who completed the baseline measurement without missing data, were included in analyses.
 - To assess the intervention effects among respondents who also participated during the followup measurement, only complete cases were analyzed. This means that cases with missing data at the follow-up measurement were excluded.
 - intention-to-treat analysis (ITT) has been conducted in order to additionally display unbiased estimates of the intervention effects.
 - For PA and dietary behavior outcomes, multiple imputation analyses were conducted by including all variables of the fully adjusted MLA model into the multiple imputation process and using 20 imputed datasets.
 - for ITT, participants who were identified as smokers at baseline were accounted as smokers if their smoking status after 6 months could not be determined.
 - The false discovery rate correcting procedure (FDR) of Benjamini and Hochberg was applied to account for multiple testing problems which is a more powerful procedure as compared to procedures controlling the traditional familywise error rate

Health Navigation	Study Type: Interventional Study Design: Allocation: Randomized Endpoint Classification: Efficacy Study Intervention Model: Parallel Assignment Masking: Open Label Primary Purpose: Supportive Care Baseline to 12 weeks.	Primary Outcome Measures: <ul style="list-style-type: none"> • Score of fatigue Severity BFI and FSS Secondary Outcome Measures: <ul style="list-style-type: none"> • Mean scores of symptom • Scores of EORTC QLQ-C30 • Energy-Conservation Strategies Inventory (ECSI) • Physical activity was measured by metabolic equivalent of task (MET), 	<ul style="list-style-type: none"> • Used counts and percentages for categorical variables and means and standard deviation for continuous variables in the descriptive analysis. • The primary outcome was change in fatigue scores on the BFI and FSS from baseline to 12 weeks. We summarized the secondary outcomes with ECSI (, MNA and MET, and HRQOL assessments such as HADS, MOS-SS,26 BPI, and functioning subscales of the EORTC QLQ-C30 according to recommended algorithms.
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- Hospital Anxiety and Depression Scale (HADS)
- Mini-Nutritional Assessment questionnaire (MNA)
- Brief Pain Inventory
- Medical Outcome Study–Sleep Scale (MOS-SS),
- stage of readiness(physical activity, nutrition, sleep hygiene, distress, pain control, energy conservation)
- Cronbach alpha values to evaluate the internal consistency of all scales and ttests to determine significant differences in baseline characteristics between the experimental and control arms.
- For intent-to-treat analysis: last observation carried forward to impute scores for missing values.
- analysis of covariance to compare between-group changes in outcome from baseline to 12 weeks by adjusting for baseline score, age, sex, and type and stage of cancer.
- Multiple logistic regression, adjusted for age, sex, and type of cancer, to determine whether the clinically meaningful change of outcome measures from baseline to 3 months differed between the two groups. Also determined whether they differed between the two groups among patients with moderate to severe fatigue (BFI_4) versus mild fatigue (BFI_4) at baseline. We determined the effect size with the Cohen statistic, which is a measure of the difference between two means (in this case, the mean in the intervention group minus the mean in the control group divided by the standard deviation for the pooled data).
- Logistic regressions to identify the factors at baseline that predicted clinically meaningful improvement in the global score of BFI, FSS, and global QOL. Analysed the interaction between the predictors and the intervention dummy.
- All statistical tests were two sided and performed using SAS version 9.2 (SAS Institute, Cary, NC). We also applied Bonferroni correction methods to adjust for multiple comparisons and to maintain a family-wise error rate of less than 0.05. For four primary end points

Survive and Thrive	a randomized controlled delayed-treatment design. Allocation: Randomized Endpoint Classification: Efficacy Study Intervention Model: Single Group Assignment	Primary Outcome Measures: • Document patterns of health care utilization <ul style="list-style-type: none"> • Brief Fatigue Inventory (BFI) • Women’s Health Initiative Insomnia Rating Scale (WHIIRS) 	<ul style="list-style-type: none"> • Baseline characteristics were reported as percentages for categorical variables and means and standard deviations for continuous variables. Differences between participants randomized to the control and intervention conditions were assessed using chi-square tests for categorical variables and t test for continuous variables.
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Masking: Open Label Primary Purpose: Supportive Care Survey data were collected at two time points: baseline and six months later	<ul style="list-style-type: none"> • Godin Exercise Questionnaire • The Block Food Frequency Questionnaire • The Patient Health Questionnaire (PHQ-8) • Quality of Life • Outcome Measure: Better Interactions with Oncologists 	<ul style="list-style-type: none"> • The primary analyses compared change from baseline to 6 months in the two conditions for the following outcome measures: fatigue, insomnia, minutes per week of physical activity (categorized as strenuous plus moderate aerobic, strenuous aerobic, moderate aerobic, mild aerobic, and stretching), servings of fruits and vegetables eaten per week, and depression. • Mixed linear models, including a random intercept term for each participant, were used to estimate and compare differences in outcomes over time between conditions • The treatment effect was assessed by the F test of the fixed interaction parameter for time and intervention group. • Models were adjusted for covariates selected a priori as likely to be related to the outcomes measures in this population. Analyses were conducted using SAS, version 9.2. P values were two-sided and $P < .05$ was considered statistically significant.
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PERC	<p>Quantitative, qualitative, mixed-methods approach.</p> <ul style="list-style-type: none"> • Paired-user testing, gathering information through natural discussion • Contextual interviews using a think-aloud protocol • postpilot exit interviews were conducted using guidelines from www.usability.gov; • semistructured interview guide was used to ask couples about their experience with PERC. • Two experienced qualitative researchers conducted the interviews. To ensure consistency and reduce variability, these researchers were involved in 	<ul style="list-style-type: none"> • Quality of life was measured using the 27-item Functional Assessment of Chronic Illness Therapy–General (FACT-G) • Symptom distress related to PCa-specific symptoms: 26-item Expanded Prostate Cancer Index Composite (EPIC) • General symptoms (e.g., fatigue, pain, sleep disturbance) were measured with the 21-item symptom scale, in which patients and partners rated their own symptoms • Dyadic communication about PCa was measured using a 21-item, five-point Likert-type Mutuality and Interpersonal Sensitivity Scale (Lewis, 1996). • Relationship satisfaction was measured with the Relationship Assessment Scale 	<ul style="list-style-type: none"> • Descriptive statistics were calculated separately for patients and partners. • The small sample size provided limited power to use inferential statistics; therefore, between-group effect sizes were used to evaluate treatment effects (i.e., small, $d = 0.2$; medium, $d = 0.5$; and large, $d = 0.8$) (Cohen, 1988). • Effect sizes were calculated using Dunlap’s method, which accounts for correlation between measures (Dunlap, Cortina, Vaslow, & Burke, 1996). • A thematic qualitative analysis was performed on the postpilot telephone interviews, which were audio recorded. • Two researchers independently reviewed each recording and discussed for consensus and appropriate interpretation of context. Main themes and values were summarized.
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- developing the interview guide. They also listened to each other's audio recordings of participants and had pre- and postinterview discussions.
- Usability testing sessions were video recorded, and a notetaker monitored couples' interactions with the program and documented feedback and any problems with using the site.
 - completed online surveys before and after the intervention period, which ranged from three to eight weeks.
 - Type of treatment was collected from patients' medical records.
 - Qualitative evaluation: postpilot interviews: audio recorded and lasted 45–60 minutes
 - Personal factors were self-reported
 - Data about web activity (e.g., number of logins, time spent on the site) were collected through a built-in, automatic tracking system.
- Data about web activity (e.g., number of logins, time spent on the site)
 - Perceived ease of use was a postpilot online questionnaire.
 - Personal factors included participant gender, age, race and ethnicity, education, work status, and annual household income.
 - Health literacy was measured using the single-item literacy screener
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TRIAL	RESULTS/ FINDINGS	PRINCIPAL FINDINGS	AUTHOR CONCLUSIONS
RESTORE	<ul style="list-style-type: none"> • Some participants encountered problems navigating RESTORE, experienced difficulties logging on, had password refused and reported screens freezing or closing down unexpectedly. • Half of participants in the process evaluation felt the timing of participation was ‘about right’. The remainder would have preferred RESTORE sooner. • Most participants identified benefits of taking part in the trial, including feeling supported and reassured that someone was interested in their condition. • A number made positive changes to their lifestyle as a result of using RESTORE or the leaflet. • Most reported an increase in confidence to self-manage the effects of CRF and considered their CRF to be less bothersome. • Of those who accessed both RESTORE and the leaflet, half preferred RESTORE, finding it more flexible and interactive. Others felt the leaflet was more convenient as it was immediately available and could be consulted any time. • Suggested improvements to the intervention included providing more cancer-specific information and more personalised feedback. • Total attrition rate (consent to T2) was 36 %. Nine people (5.5 %) actively withdrew and 36 (22.1 %) did not complete follow-up questionnaires. • No adverse events were reported. • Seventy-one percent of participants were deemed to have adhered with the intervention (logged on to sessions 1 and 2 and a third session). Sixty percent logged on to four sessions, 43 % to five sessions. • There is evidence of improved fatigue self-efficacy at T1 (0.514, 95 % CI [−0.084, 1.112], P=0.09), in the RESTORE group though the impact is lost by T2. There is no evidence of difference between groups for any other outcomes. • No process evaluation participants reported having to learn new skills to use RESTORE. Concerns were raised that older people might struggle if they did not use computers regularly. • Some participants encountered problems navigating RESTORE, experienced difficulties logging on, had password refused and reported screens freezing or 	<p>The intervention was found to be feasible and acceptable and established proof of concept. Uptake of the intervention was high (39 %) compared to that of similar interventions. Although not powered to detect change, there was evidence of higher fatigue self-efficacy at T1 in the RESTORE group compared with the comparator group, though improvements in the comparator group meant the difference between groups was negligible by 12 weeks. The findings from this exploratory trial suggest that RESTORE is feasible and acceptable and warrants testing in a larger efficacy trial. However, a number of refinements to RESTORE are required before testing its effectiveness in a large trial, for example including cancer-site-specific information, providing more personalised feedback on progress and targeting the intervention for participants within 12 months of treatment completion. This is a potentially important form of support for the growing numbers of cancer survivors living with and managing consequences of cancer and its treatment.</p>	<p>The findings from this exploratory trial suggest that RESTORE is feasible and acceptable and warrants testing in a larger efficacy trial. However, a number of refinements to RESTORE are required before testing its effectiveness in a large trial, for example including cancer-site-specific information, providing more personalised feedback on progress and targeting the intervention for participants within 12 months of treatment completion. This is a potentially important form of support for the growing numbers of cancer survivors living with and managing consequences of cancer and its treatment.</p>

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- Half of participants in the process evaluation felt the timing of participation was ‘about right’. The remainder would have preferred RESTORE sooner.
- Most participants identified benefits of taking part in the trial, including feeling supported and reassured that someone was interested in their condition.
- A number made positive changes to their lifestyle as a result of using RESTORE or the leaflet.
- Most reported an increase in confidence to self-manage the effects of CRF and considered their CRF to be less bothersome.
- Of those who accessed both RESTORE and the leaflet, half preferred RESTORE, finding it more flexible and interactive. Others felt the leaflet was more convenient as it was immediately available and could be consulted any time.
- Suggested improvements to the intervention included providing more cancer-specific information and more personalised feedback.
- Total attrition rate (consent to T2) was 36 %. Nine people (5.5 %) actively withdrew and 36 (22.1 %) did not complete follow-up questionnaires.
- No adverse events were reported.
- Seventy-one percent of participants were deemed to have adhered with the intervention (logged on to sessions 1 and 2 and a third session). Sixty percent logged on to four sessions, 43 % to five sessions.
- There is evidence of improved fatigue self-efficacy at T1 (0.514, 95 % CI [-0.084, 1.112], P=0.09), in the RESTORE group though the impact is lost by T2. There is no evidence of difference between groups for any other outcomes.
- The pattern of fatigue self-efficacy for adherent and nonadherent individuals was similar to the patterns observed for the RESTORE and comparator groups
- There was a high proportion of missing health economic data, making an economic evaluation challenging and formal statistical comparisons impossible. Examination of available descriptive data suggests comparable use of resources between groups: mean number of visits to a GP practice at T2 2.29 (1.27) in the RESTORE and 1.90 (1.04) in the comparator groups, and 1.41 (0.80) and 1.29 (1.27) visits to the oncologist respectively.

STRIDE	Participant compliance for logging steps was near perfect for the 6 weeks, with a total of 12 days of steps not logged across eight participants. The average number of website log-ins across the 6-week period was 41. The least	Participants in this study identified numerous improvements that they attributed to the program. These	The adoption of physical activity has been associated with improved outcomes for
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frequent user logged in 8 times and the most frequent 73 times. On average participants increased their daily step counts by 16% from week 2 to week 6 of the program. Similar themes emerged in the interviews for each participant after taking into account differing participant characteristics. No new major themes emerged after conducting these eight interviews. Five key themes emerged from the qualitative data that shed light on the perceived feasibility and usefulness of the STRIDE program:

- STRIDE program as a motivator
- Identified improvements
- Tailored/individualised step goals
- Perceptions of the STRIDE website
- Ease of use
- Developing self-awareness
- Social support and sharing experiences
- Participants' suggestions for improving the program

Another recurrent suggestion was more input from the STRIDE team on the forum.

included reduced fatigue and improved confidence, improved physical outcomes and mental outlook. These benefits are similar to those described in other exercise interventions among cancer survivors using qualitative analyses. The most notable theme was the usefulness of the program to increase awareness of physical activity and to provide motivation to increase walking. The combination of wearing the pedometer, recording steps on the step log and tracking progress on the graph allowed participants to self-monitor their behaviour.

cancer survivors. These findings suggest positive health benefits for this vulnerable population, particularly in relation to the co-morbidities often associated with cancer and its treatment. This program could be offered as an effective and accessible option for larger populations of cancer survivors to increase and maintain physical activity after having had a cancer diagnosis. A randomized controlled trial of this program is warranted.

Wsdei (Health planner)

Moderate intensity aerobic exercise for at least 150 min per week ($p < 0.0001$) and eating five servings of F&V per day ($p = 0.001$) significantly increased in the intervention group compared to controls. The intervention group also showed a greater improvement in overall diet quality than did controls ($p = 0.001$). The proportion of patients in whom protein intake met the RDA was also significantly higher in the intervention group than in controls ($p = 0.016$). The proportion of patients in whom calcium intake met the RDA was significantly higher in the intervention group than in controls ($p = 0.003$). In terms of the HRQOL, the physical functioning ($p = 0.023$) and appetite loss ($p = 0.034$) scores, as measured according to the EORTC QLQ-C30, improved to a significantly greater degree in the intervention group than in the control group. The severity of fatigue, as measured using the BFI, improved to a significantly greater extent in the intervention group than in the control group ($p = 0.032$). The stage of change for exercise ($p < 0.0001$) and F&V consumption ($p = 0.029$) were significantly higher in the intervention group than in controls. There was a significant between-groups difference in self-efficacy for exercise management ($p = 0.024$). A significant between-group

The present study suggests that the WSEDI effectively increased the duration of weekly exercise, the daily intake of F&V, overall dietary quality, physical functioning, appetite loss (measured by the HRQOL), and fatigue (assessed using the BFI). The WSEDI appears to be an appropriate alternative method for improving the exercise and dietary behaviours of breast cancer patients.

The WSEDI, which targets changes in exercise and dietary behaviours, might be an effective alternative method for improving the weekly exercise duration, daily F&V intake, overall dietary quality, physical functioning, appetite loss, and fatigue if the TTM theory has been used to inform the program strategy. However, further research with a larger sample size is required to make conclusive claims.

difference was also evident in terms of self-efficacy to increase F&V intake ($p = 0.023$).

Oncowijzer	<ul style="list-style-type: none">• Use of the website<ul style="list-style-type: none">o the website was visited by 21 survivors and 8 intimate partnerso Survivors' and partners' total time spent on the website was on average 32 minutes and 19 minutes respectivelyo The average frequency of visiting the website was 1.71 times (SD=1.10) for survivors and 1.38 times (SD=0.74) for partners.o the Breast cancer and Physical consequences menus were visited most frequently and for the longest amount of time, viz. nearly 14 minutes.o The Psychological and Social consequences menus were consulted least and for about 3 minutes.o Not all visitors of the website's main menus visited its subsections.o Per main menu, the subsection that was visited most was 'After treatment' (n=13) on the Breast cancer menu, 'Hot flashes' (n=6) on the Physical consequences menu, 'Difficulties coping' (n=3) on the Psychological consequences menu, 'Relationship with partner' (n=2) on the Social consequences menu, 'Financial help' (n=5) on the Work and financial menu, 'A healthy weight' (n=6) on the Life style menu, and 'Caregivers' (n=3) on the Help guide.o A minority of survivors visited the partner section of the website. As indicated by their mean duration, these visits merely consisted of a brief scanning of the sections on the partner section.o Menus on the partner section most frequently visited by partners were the Breast cancer and the Understanding my partner menus, which were consulted for about 5 minutes and 8 minutes respectively. most time was spent by partners on the Supportingo my partner menu, viz. nearly 14 minutes. The subsection of each main menu that was visited most was 'After treatment' (n=3) on the Breast cancer menu, 'Sexual complaints' (n=3) on the Understanding my partner menuo , and 'E-mail' (n=1), 'Internet forum' (n=1), and 'Telephone' (n=1) on the Help guide. two partners had visited the Life style section on the survivor part of the websiteo As no navigation is required to consult the subsections on the My complaints and Supporting my partner menus, consultation of their subsections could not be registered.	<p>Fifty-seven percent (n=21) of survivors who took part in the post-measurement indicated that they had visited the website. Compared to non-visitors (n=16), they were more likely to have a partner and a higher income reported higher levels of self-esteem and had completed treatment for a longer period of time. Partners who consulted the on-line information (42%, n=8) were younger and reported lower levels of social support compared to partners who did not visit the website (n=11). Visitors generally evaluated the content and lay-out positively, yet some believed the information was incomplete and impersonal.</p>	<p>This study signifies the first step in evaluating a new informative and tailored website for supporting survivors and intimate partners during the transition period after completion of treatment. As only about half of participants consulted the on-line information, the informative website as an intervention method proved not to appeal to all participants. To effectively reach breast cancer survivors and partners after completion of treatment, an informative website ought to be supplemented by other ways of providing post-treatment care (e.g. informative brochures, consults with a psychologist etc.). On-line provision of information and support ought to be considered as only one part of a multi-modal stepped-care approach. Of those who visited the website, some believed the on-line information was incomplete and impersonal. Therefore, the website's content needs to be optimized further by adding, if possible, more detailed information</p>
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Evaluation of the website

- number of participants that evaluated the website sections at the post-measurement might differ from the number of participants that visited the website, as registered by the tracking system (registration of use from date of baseline assessment until date of postmeasurement).
- The mean score attributed by survivors to the main menus (score between from 0 to 10) amounted to 7 or more. Menus on the partner section were generally evaluated positively, apart from the My complaints menu (4.00).
- On average the entire website's content and lay-out were rated positively
- Generally participants believed the website was user-friendly, well built, interesting, informative, understandable and new
- Participants did not judge the website as being incomplete, irrelevant, implausible, too extensive and confusing.
- The classification of themes, the use of colors, the images, the ability to select personally relevant information and the links to websites and brochures were generally rated positively by participants.
- Visiting the website had led 2 survivors (9%) and 2 partners (25%) to download or order brochures on others websites. Four partners (50%) and 7 survivors (32%) indicated that they got to know other cancer websites as a consequence of visiting the website. Only one survivor consulted the 'instructions for use' section, which might indicate that the lay-out of the website is self-evident.
- The open question about their remarks and suggestions for improvement of the website. Several participants used this opportunity to share their positive experiences with the website (e.g. conveniently arranged, easy to use, interesting range of subjects, etc.).
- Participants' remarks considered the fact that the information provided on the website was impersonal, vague and not new. Some suggestions were made regarding additional topics to be included in the website: e.g. more detailed information regarding survival rates according to the tumor type, catheters, side effects of medication, new medication and the course of follow-up consultations. Two survivors used of the feedback function of the website to suggest topics to be discussed in more depth: breast cancer recurrence and causes of breast cancer.

Differences between visitors and non-visitors of the website

- Sixteen survivors (43% of the survivors of the postmeasure, n=37) and 11

regarding some topics. Nevertheless, the informative website's content and lay-out were generally rated positively.

partners (58% of the partners of the post-measure, n=19) who did not visit the website, were asked to indicate why they did not consult the online information.

- o 5 survivors and 3 partners reported not to have visited the website because they are not acquainted with the Internet.
- o Eight survivors and 4 partners reported that they were not interested or did not desire any cancer-related information.
- o Two partners reported not to have had time to visit the website.
- o One partner forgot to visit the website and one survivor reported problems with the Internet prevented her from consulting the on-line information.
- Results of the analyses of the differences between visitors and non-visitors of the website must be interpreted cautiously given the small sample sizes of survivors and partners.
- Compared to survivors who did not visit the website, survivors who consulted the website were
 - o more likely to have an intimate partner ($\chi^2 = 5.63, p \leq 0.05$)
 - o and to fall in the higher earnings category ($\chi^2 = 5.59, p \leq 0.05$).
- Survivors who visited the website
 - o had completed primary treatment for a longer period of time compared to survivors who did not visit the website ($t = -2.23, p \leq 0.05$).
 - o did not differ regarding their physical and psychosocial functioning.
 - o No differences were found between levels of anxiety, depression, illness representations, social support, lack of social support, coping strategies, body image, future perspective, physical side effects and fatigue.
 - o Survivors who visited the website reported higher levels of self-esteem ($t = -3.16, p \leq 0.01$).
 - o No differences were found concerning survivors' care needs or acquaintance with the Internet.
- Compared to partners who did not visit the website, those who consulted the website were
 - o were younger (48.4 years old) than their counterparts
 - o No differences were found concerning the medical characteristics of the partners' spouse.
 - o reported lower levels of social support
 - o no other differences were found regarding partners' psychosocial characteristics: anxiety, depression, self-esteem, illness representations, lack

of social support, coping strategies, perceived stress and self-efficacy.
o no differences were found regarding partners' care needs or acquaintance with the Internet.

BREATH	<p>Statistical Effect</p> <ul style="list-style-type: none"> • The decrease in distress at T1 was significantly greater in CAU_BREATH participants than in CAU-alone participants, with a small-to-medium effect size ($d = 0.33$). Baseline distress explained 53% of the variance in distress at T1 ($P < .005$). No such difference in empowerment was found. • Secondary outcome analyses revealed that CAU_BREATH led to significant improvements in five of seven negative adjustment variables (general and cancer-specific distress, fatigue, and two fear of cancer recurrence outcomes) with small-to-medium effect sizes ($d = 0.37$ to 0.55), and in 3 of 10 positive adjustment variables (self-efficacy, remoralization, new ways of living) with small-to medium effect sizes ($d = 0.26$ to 0.39). • More CAU _ BREATH participants (39 of 70 [56%]; 95% CI, 44.1 to 66.8) than CAU-alone participants (32 of 80 [40%]; 95% CI, 30.0 to 51.0) showed a clinically significant improvement ($P = .03$). • More high-distress BCSs did not show a clinically significant improvement after CAU _ BREATH than after CAU alone (10 of 21 [48%]; 95% CI, 28.3 to 67.6 v 14 of 27 [52%]; 95% CI, 34.0 to 69.3, respectively; $P = .39$). Post hoc analysis revealed that there was no difference in the proportion of high-distress BCSs showing clinical deterioration (5 of 21 [24%] v 2 of 27 [7%], respectively; $P = .06$). • Of the low-distress BCSs, more CAU _ BREATH participants than CAU-alone participants showed clinical improvement or no change (41 of 49 [84%]; 95% CI, 71.0 to 91.5 v 35 of 53 [66%]; 95% CI, 52.6 to 77.3 respectively; $P = .02$). Compared with CAU-alone participants, CAU_BREATH participants showed more clinically significant improvement (29 of 49 [59%] v 18 of 53 [34%], respectively; $P = .006$) and less deterioration (8 of 49 [16%] v 18 of 53 [34%], respectively; $P = .02$). • The empowerment hypothesis was not tested, because empowerment was not significantly different between CAU_BREATH and CAU alone. 	<p>CAU + BREATH participants reported significantly less distress than CAU-alone participants (-7.79; 95% CI, -14.31 to -1.27; $P = .02$) with a small-to-medium effect size ($d = 0.33$), but empowerment was not affected (-1.71; 95% CI, 5.20 to -1.79; $P = .34$). More CAU + BREATH participants (39 of 70 [56%]; 95% CI, 44.1 to 66.8) than CAU-alone participants (32 of 80 [40%]; 95% CI, 30.0 to 51.0) showed clinically significant improvement ($P = .03$). This clinical effect was most prominent in low-distress BCSs. Secondary outcomes confirmed primary outcomes. There were no between-group differences in primary outcomes during follow-up.</p>	<p>To the best of our knowledge, this is the first RCT to demonstrate an additional effect of a self-management intervention specifically designed to support BCSs in the year after treatment completion. Although small, the primary effect on distress was statistically robust and clinically relevant. Moreover, the intervention does not necessarily require a lot of user commitment. Future research should focus on replicating the current findings, using more valid questionnaires for the positive adjustment variables, and evaluating the follow-up effect beyond 4 months of access. The magnitude of the effect in BCSs with low and high distress should be investigated further. BREATH demonstrated its potential as a feasible first step in a matched supportive care model providing evidence-based and easily accessible re-entry care.</p>
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- At T2 and T3, distress was significantly reduced regardless of group assignment ($F[3, 120] = 5.88$; $P = .001$). This was also true for the secondary negative adjustment outcomes of fear of cancer recurrence (Cancer Worry Scale; $F[3, 120] = 5.954$; $P = .001$), fatigue ($F[3, 120] = 4.40$; $P = .006$), and helplessness ($F[3, 120] = 11.964$; $P = .000$). A significant time_group interaction effect was found for fear of cancer recurrence (Cancer Worry Scale; $F[3, 120] = 4.563$; $P = .005$), with CAU _ BREATH participants reporting less fear than CAU-alone participants at T2 (-1.459 ; 95% CI, 2.743 to 0.175).
- Of the positive adjustment outcomes, acceptance significantly improved in both groups (ICQ; $F[3, 120] = 8.531$; $P = .000$). Time effects and time _ group interactions were not significant for all remaining outcomes, including empowerment
- Use of the BREATH intervention varied considerably. Frequency of logins ranged from 0 to 45, total duration ranged from 0 to 2,324 minutes, and activity ranged from 0 to 104 intervention components opened. The mean difference in distress (SCL-90, T0 to T1) was not correlated with frequency ($r = 0.007$; $P = .96$), total duration ($r = 0.000$; $P = 1.00$), or activity ($r = 1.072$; $P = .55$).
- At T1, similar proportions of women in CAU _ BREATH and CAU alone had consulted the Internet in the previous 4 months on a monthly (24% v 34%), weekly (13% v 8%), or daily (0% v 2%) basis, or not at all (61% v 58%).
- There were also no significant differences ($n = 126$; $P = .27$) between CAU _ BREATH and CAU-alone participants in the use of individual support (eg, psychologist; 12% v 25%, respectively), peer and rehabilitation support groups (14% v 12%, respectively), or combined individual and group support (21% v 13%, respectively). Half of the participants in both groups did not make use of other support (53% v 50%, respectively).

Kanker Nazorg Wijze	<ul style="list-style-type: none"> • Significant differences were found in change over time concerning moderate PA ($B = 117.738$, $p = .037$, $p \text{ fdr} = .148$, $d = -0.25$, $f^2 = .007$) between IC and UC. However, these differences did not remain significant after controlling for multiple testing. No significant intervention effects were found in the other PA 	After 6 months, 409 participants completed follow-up (dropout= 11.5 %). Indications were found that access to the intervention may result in	Having access to the KNW and following the KNW modules do affect lifestyle behaviors, although to a limited extent.
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outcomes. Their effect sizes ranged from $d = 0.01$ to 0.10 ; $f^2 = .000$ to $.006$)

- A significant higher increase in moderate PA was found among users of the PA module ($B = 179.609$, $p = 0.22$, $p \text{ fdr} = .120$, $d = -0.32$, $f^2 = 0.013$) compared to participants who did not follow the PA module. This effect did not remain significant after correction for multiple testing.
- Significant intervention effects on vegetable consumption using the fully adjusted MLA model (complete cases: $B = 9.15$, $p = .027$, $p \text{ fdr} = .148$, $d = -0.37$, $f^2 = -.013$; ITT: $B = 9.57$, $p = .023$, $p \text{ fdr} = .160$) did not remain significant after accounting for multiple testing. No significant effects of having access to the KNW were found on the other dietary behavior outcomes after 6 months.
- Users of the module Diet had a significantly higher increase in fruit ($B = .181$, $p = .031$, $p \text{ fdr} = .120$, $d = -0.12$, $f^2 = .016$) and fish intake ($B = .542$, $p = .045$, $p \text{ fdr} = .120$, $d = -0.11$, $f^2 = -.002$) after 6 months. A significant increase in vegetable consumption was found among participants who did not follow module Diet ($B = 11.123$, $p = .048$, $p \text{ fdr} = .384$, $d = -0.23$, $f^2 = -.018$). After controlling for multiple comparisons, these results did not remain significant
- At baseline, 27 (11.7 %) respondents of the IC, and 32 (13.9 %) respondents of the UC were current smokers (Table 1). After 6 months, respectively, 18 (7.8 %) and 28 (13.5 %) respondents of IC and UC were current smokers. From the smokers at baseline, 18 (81.8 %) were persistent smokers and 4 (18.8 %) were quitters after 6 months in the IC. In the UC, 26 (92.9 %) were persistent smokers and 2 (7.1 %) were quitters after 6 months. No significant intervention effect was found between groups at Follow-up ($X^2 = 1.42$, $p = .233$, OR 2.89). ITT revealed comparable results ($X^2 = 1.18$, $p = .278$, OR = 2.61) (X^2 tests are not displayed in Table 1).

increases of moderate PA and vegetable intake. The moderate PA increase was meaningful: 74.74 min p/w higher increase in the intervention condition. Effect sizes of moderate PA ($d = .25$) and vegetable ($d = .37$) consumption were comparable to prior effective interventions. Visiting behavior-related modules affected moderate PA, fruit, and fish consumption. However, after correction for multiple testing, significances expired. No significant intervention effect was found on smoking behavior due to low numbers of smokers. Although the effectiveness was only shown only to a limited extent, this study provided several indications that this theory-based, comprehensive, and personalized eHealth intervention provides valuable content to complement usual cancer aftercare.

Meaningful increases in moderate PA were detected in the IC, and the effect size of the increase in vegetable consumption was higher than in comparable studies. Moreover, the outcomes point in the direction that following the module Diet could affect fruit and fish consumption. Non-significant results after accounting for multiple testing in moderate PA, vegetable, fruit and fish consumption might be due to the high number of outcomes and the low numbers of module users who set a goal on the specific outcome behavior. No significant intervention effect was found on smoking behavior due to the low number of smokers. An exploration of the use of this complex KNW intervention is recommended to get further insights into underlying mechanisms and to improve the intervention effectiveness. Overall, results provide preliminary indications that this theory-based, wide-ranging web-based cancer aftercare intervention can provide valuable support in usual cancer aftercare.

Health Navigation	<p>Effect of Tailored Education Program</p> <p>For primary end points, the intervention group had a significantly greater decrease in global, severity, and interference scores of BFI and in the total score of FSS compared with the control group, and Bonferroni corrections did not change the significance.</p> <p>For secondary endpoints, the intervention group showed a significantly greater increase in total MNA mean score, significantly greater decrease in HADS anxiety score, and significantly greater increase in global QOL and in emotional, cognitive, and social functioning scores of EORTC QLQ-C30 scales. For those secondary end points, significance was lost after Bonferroni corrections were applied for 15 multiple comparisons, except for cognitive functioning scores of the EORTC QLQ-C30.</p> <p>No scale showed an effect size>0.5 as primary or secondary end point.</p> <p>Clinically Meaningful Improvement</p> <p>According to the BFI, the intervention group at 12 weeks had clinically more meaningful improvement in worst fatigue than the control group. Among patients who had moderate or greater fatigue (>4 of 10 on the BFI) at baseline, the intervention group at 12 weeks had clinically more meaningful improvement than the control group in BFI global score, worst fatigue, and FSS score.</p> <p>For secondary outcomes, the intervention group had clinically more meaningful improvement than the control group in HADS anxiety score; among patients with moderate or greater fatigue at baseline, the intervention group at 12 weeks had clinically more meaningful improvement than the control group in HADS anxiety score and EORTC QLQ-C30 emotional functioning score.</p> <p>Predictors of Fatigue Change (results of logistic regression analysis exploring baseline predictors of clinically meaningful improvement in fatigue in patients who used Health Navigation).</p> <p>Those who had moderate to severe fatigue or sleep problems were more likely to show clinically meaningful improvement of global BFI; those who had comorbidities or moderate to severe fatigue were more likely to show clinically meaningful improvement of FSS; and those who were age >45 years or had moderate to severe fatigue were more likely to show clinically</p>	<p>Compared with the control group, the intervention group had an improvement in fatigue as shown by a significantly greater decrease in BFI global score (0.66 points; 95% CI 1.04 to 0.27) and FSS total score (0.49; 95% CI, 0.78 to 0.21). In secondary outcomes, the intervention group experienced a significantly greater decrease in HADS anxiety score (0.90; 95% CI, 1.51 to 0.29) as well as global quality of life (5.22; 95% CI, 0.93 to 9.50) and several functioning scores of the EORTC QLQ-C30.</p>	<p>our findings indicate that a Web-based self-management intervention may provide an effective treatment for CRF, especially for moderate or greater fatigue.</p>
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meaningful improvement of global QOL. According to analysis of the interaction between the predictors and the intervention dummy, the effect of intervention on clinically meaningful improvement of BFI global score was more evident in patients who at baseline had a lower BPI severity score, high Sleep Quality Index I score, or high Sleep Quality Index II score. Additionally, the effect of intervention on clinically meaningful improvement of FSS score was evident in patients who at baseline had a comorbidity, whereas the effect on clinically meaningful improvement of GHS/QOL score was shown in patients who at baseline had moderate to severe fatigue (BFI global score > 4).

<p>Survive and Thrive</p>		<p>Participants in the treatment condition had significant reductions in insomnia and engaged in more strenuous and stretching exercises than those in the control condition.</p> <p>the Thriving and Surviving with Cancer intervention has been proven a relative success and additional efforts to understand what components are related to the most success could help further develop this, or any, Web-based intervention program.</p>
<p>PERC</p> <p>Twenty-five couples (96%) completed PERC, and 22 completed the postintervention survey; the retention rate was 85%. Dropouts were because of family death (n = 1), family illness (n = 1), and loss to follow-up (n = 2). The final sample size for analysis was 22 couples.</p> <p>Preintervention data suggested that patients and partners reported relatively mild symptoms, good quality of life, and positive psychosocial outcomes compared to participants in previous studies (Song et al., 2011). Pre- to postintervention changes indicated improvement in urinary irritability and bowel dysfunction scores for patients (d = 0.18 and d = 0.17, respectively). Observed improvement in partners' perception of patients' PCa symptoms as problems was particularly promising (0.18 to 0.51). Small effect sizes were also observed for improvement of general symptoms for patients and partners (d = 0.21 and d = 0.38, respectively). Improvement in physical and social quality of life was promising for patients (d = 0.32). A small increase (d = 0.25) in social quality of life for partners was noted. Among the 22 couples who completed pre- and postintervention assessments, eight couples always logged in jointly, five</p>	<p>The quantitative and qualitative findings of the current study support the promise of PERC in helping to manage localized PCa treatment-related symptoms and associated distress among patients and their partners. PERC was found to be a feasible, acceptable method of reducing the side effects of PCa treatment-related symptoms and improving quality of life.</p>	<p>PERC was well received, and users reported that the current version of the program provided valuable, high-quality, and relevant content. After refining PERC and optimizing its performance based on participant feedback, critical additional work is needed to evaluate the efficacy of PERC for improving symptom management and quality of life, as well as to explore other benefits of this eHealth approach (e.g., cost effectiveness).</p>

always logged in individually, and nine logged in jointly and individually. The average number of logins per couple was 3.64 (SD = 1.68). For patients, it was 2.73 (SD = 1.2); for partners, it was 2.68 (SD = 1.39). The average total time spent on PERC per couple was 56.96 minutes (SD = 39.74). Individually, patients spent an average of 41.99 minutes (SD = 26.21) on the site, as compared to the average of 43.99 minutes (SD = 43.69) spent by partners. The site's most frequently visited sections were those on sexual dysfunction (77%), fatigue (77%), and urinary dysfunction (76%). Most of the participants (83%) used audioenhanced slides, and 94% visited the assignment and exercise section. Participants rated PERC as easy to use and understand, engaging, of high quality, and relevant. Overall, the couples were satisfied with PERC and reported that it improved their knowledge about symptom management and communication as a couple.

Eight couples completed postpilot interviews; three patients were African American (the rest were Caucasian), and five of the eight patients were aged 65 years or younger. Half had undergone surgery, and half had undergone radiation therapy. Participants reported no Internet connectivity issues when accessing PERC. After reviewing the website jointly (four couples) or independently (four couples), six of the eight couples reported that they had discussed what they read and completed assignments. Participants' comments and suggestions for improvement are summarized. Participants agreed that PERC was a useful PCa resource for patients and partners, describing it as "an information cornucopia" that was "easy to use." Other comments indicated that the content was clear, as well as that terminology and text were concise and easy to understand. Participants said finding a trustworthy source for PCa information was sometimes challenging, but that they viewed PERC as a credible source that offered them as much information as they wanted.

Participants used PERC as a starting point for further online research or as an informational resource to guide follow-up discussion with their doctors. Key features of PERC that participants liked included the straightforward index to help locate specific information, the option of either watching or reading informational content, concise modules, and content about communication and various symptoms. Other themes indicated that PERC provided a way for patients and partners to work together and strengthen their relationships during a difficult time. Regarding racial sensitivity, African American participants commented that PCa "does not discriminate" and did not think race-specific

information was necessary for PERC. Participants also noted that they liked being able to visit the site at their convenience, choose what information they viewed, and spend more time on issues of primary concern to them.
