Digital Interventions for the Continuity of Care

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11th Aarhus Workshop in Breast Surgery
24-25th May 2023

What are the key psychosocial challenges following diagnosis and treatment of breast cancer?

Breast cancer survivorship challenges

Leading a healthy lifestyle

- Exercise
- Diet
- Wellbeing

Managing treatment side effects

- Lymphoedema
- Reduced mobility/functionality

Psychological issues

- Body image
- Sexuality
- Fear of cancer recurrence
- Depression
- Anxiety

Advanced breast cancer challenges

- High levels of **distress** and **support needs**
- BUT needs not being adequately met - **health information** and **psychosocial needs**
- **Accessibility** a barrier
- Preference for home-based interventions
- Preference for internet rather than telephone delivered support

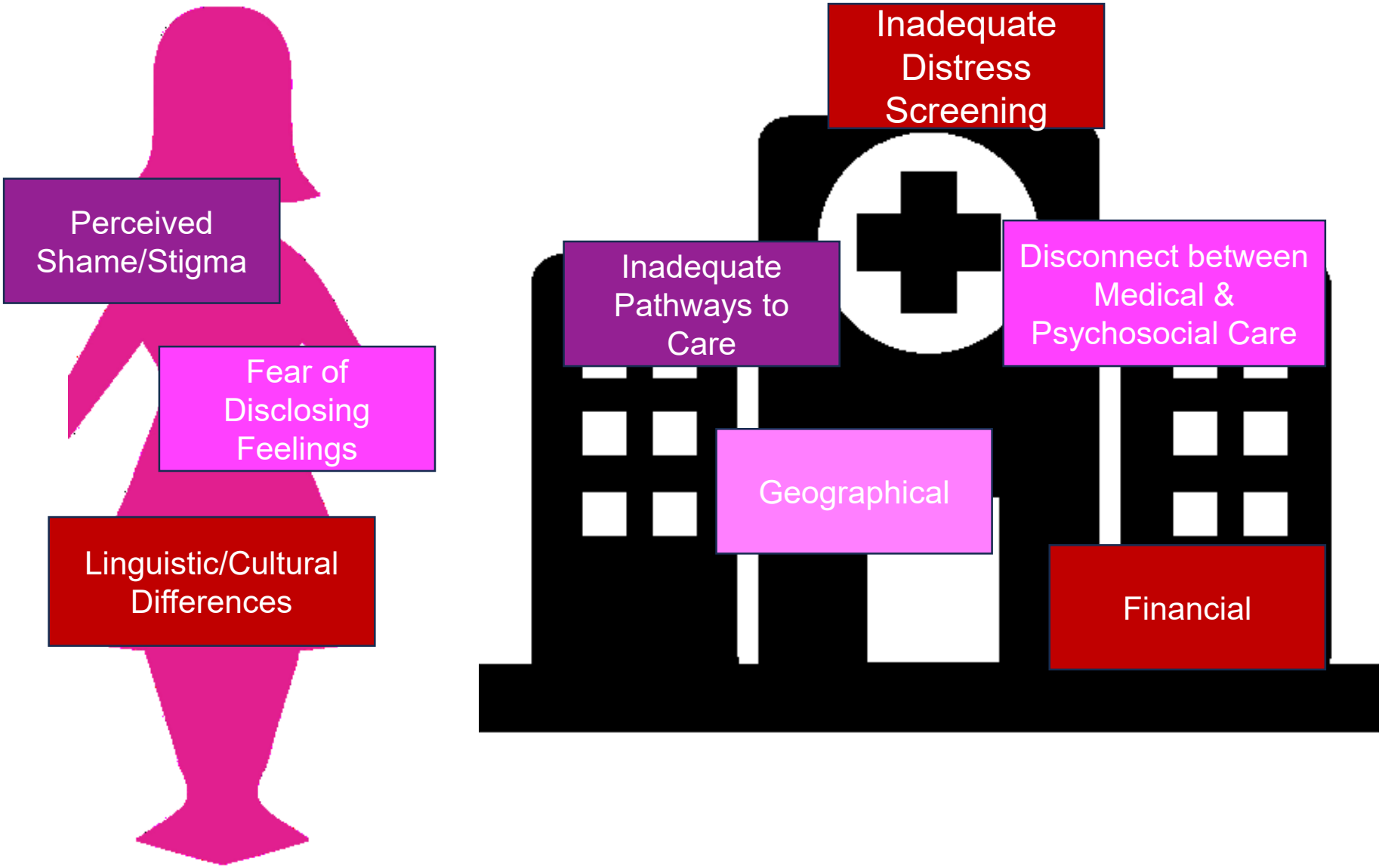
(Beatty et al., 2017; Leske et al., 2023)

Psychosocial supportive care options

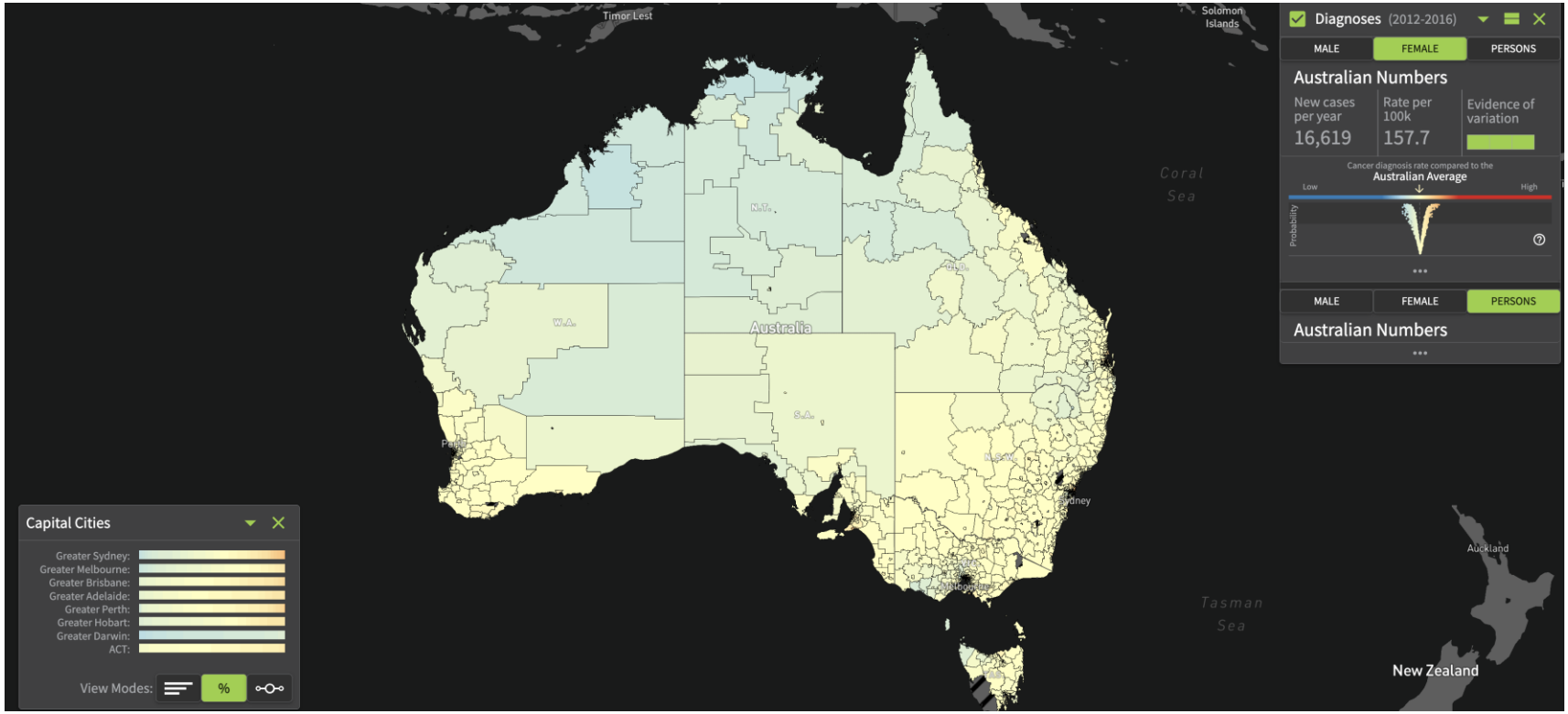
- Relaxation
- **Psychoeducation**
- Individual **psychotherapy**
- Group psychotherapy
- Counselling
- Workplace return to work support
- Spiritual support
- ‘Peer’ **support groups**

Why digital interventions and how can they facilitate adjustment into continuity of care?

Barriers to utilising psychosocial supportive care

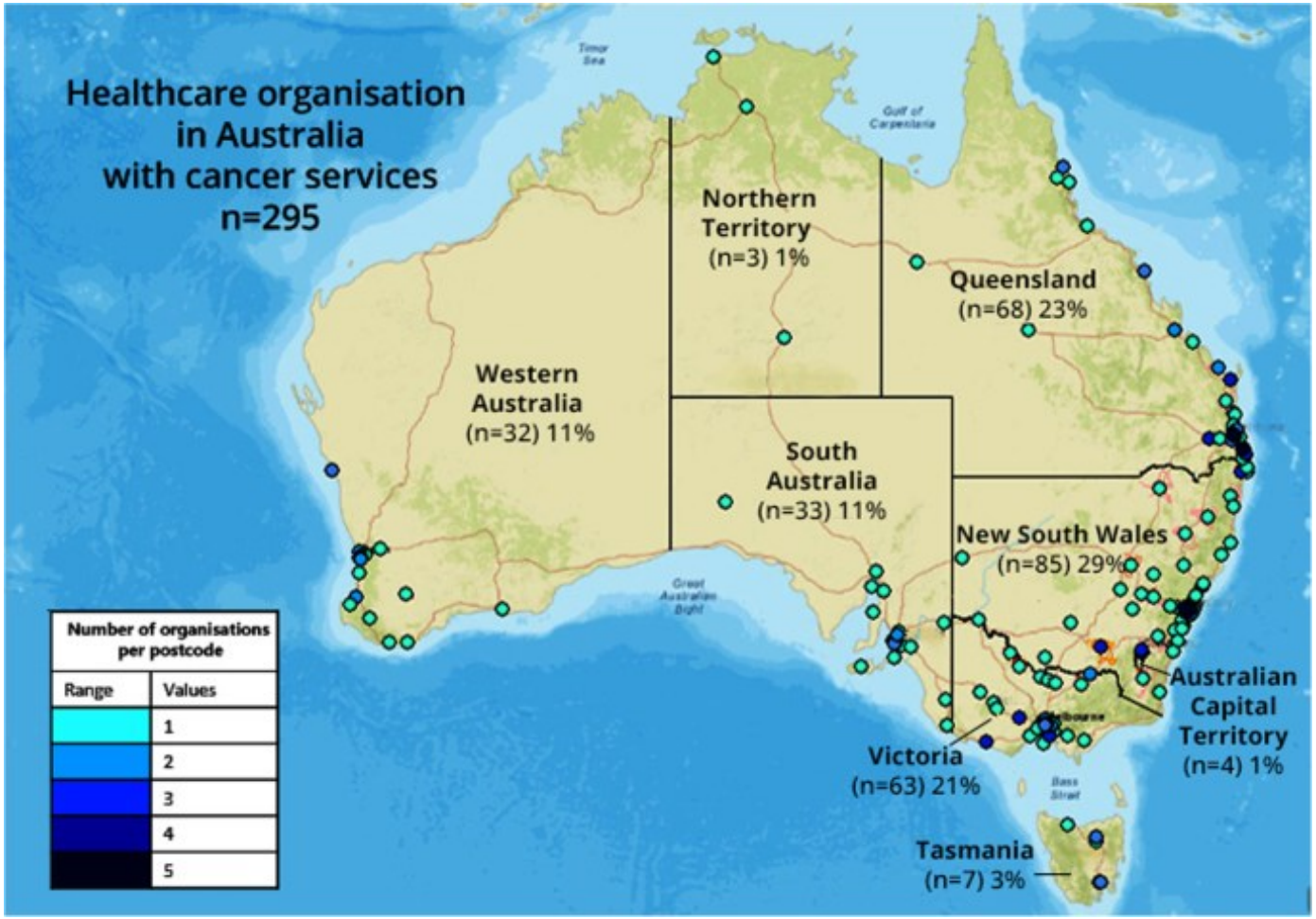


Distribution of breast cancer cases across Australia



(Australian Cancer Atlas, 2018)

Distribution of cancer care across Australia

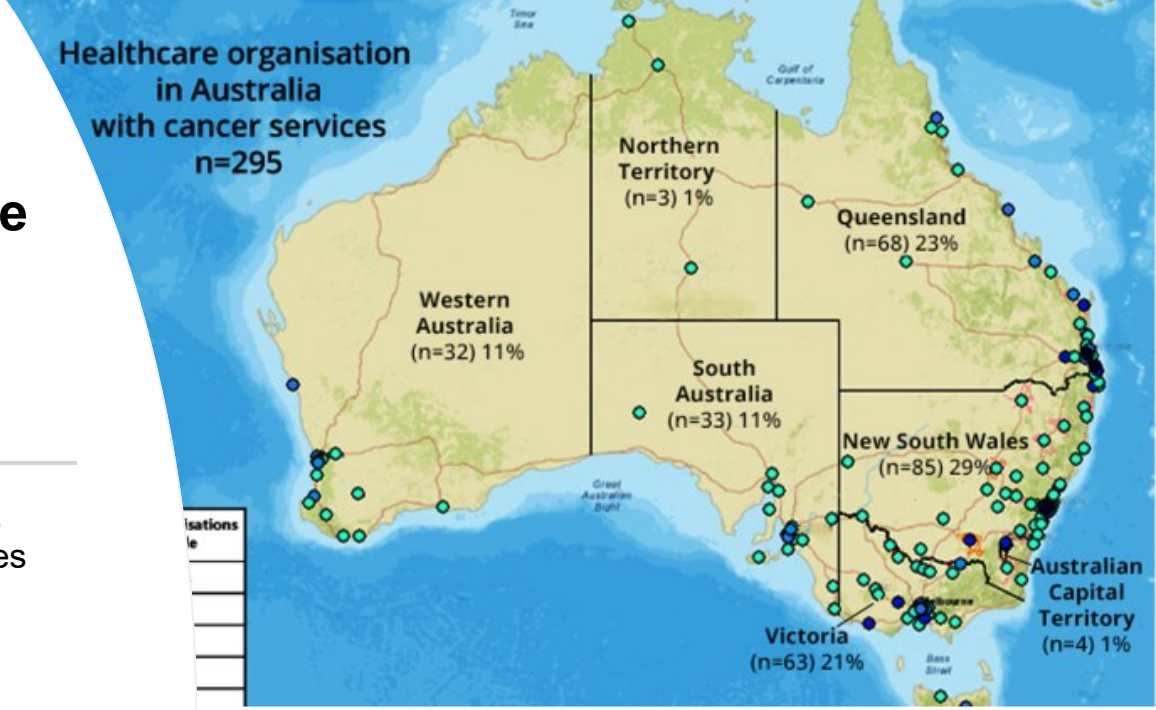


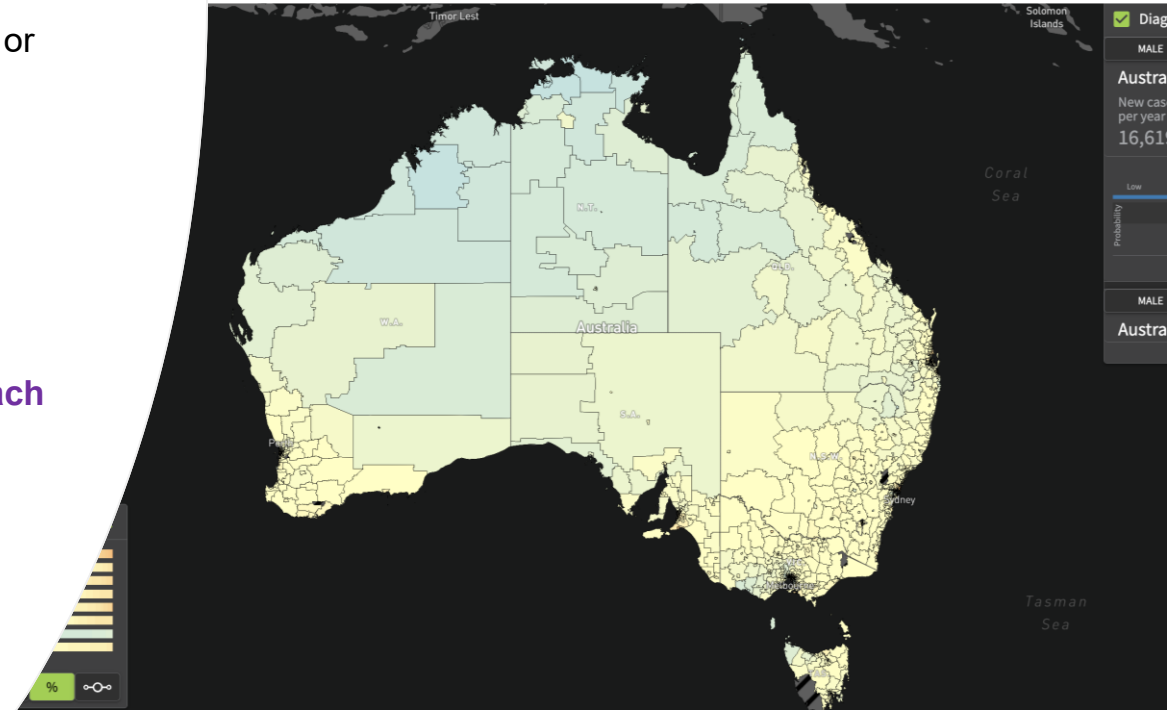
(Hunter et al., 2019)

Service gaps in cancer care across Australia

- Respondents located in **remote regions** were more likely to identify cancer services that are **dependent upon specialist medical practitioners** as the most important service gaps in their region
- 76% offer some type of supportive care or survivorship services
- YET providers identified this group of services as the **most pressing service gaps in major cities, rural and remote regions alike**
- Need for **improved integration, outreach and affordability**

(Hunter et al., 2019)



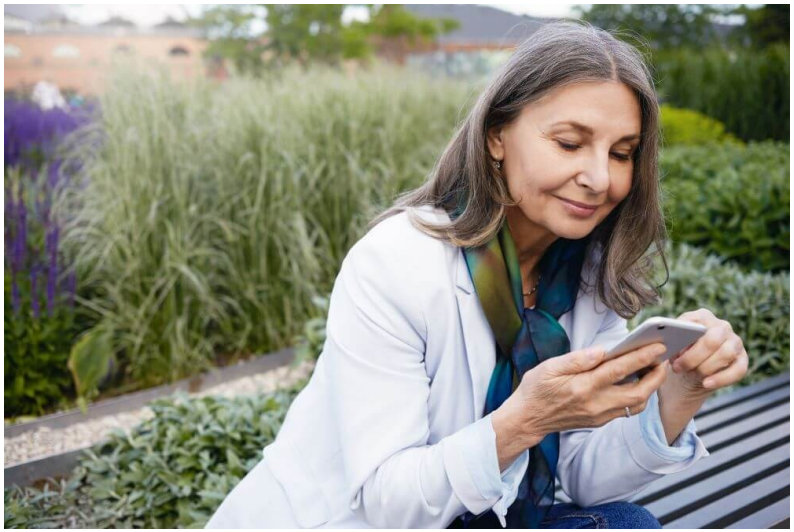


Face-to-face Interventions

Face-to-face Therapy	
High efficacy	
Low **acceptability**	
Low uptake	
Low adherence	
Low accessibility	
Time and resource intensive (particular challenges from pandemic)	
Delivered by specialists trained in psychotherapy	

Digital interventions

Activities accessed via **technology platforms** designed to provide **support** for improving mental health, lifestyle behaviours and survivorship challenges



Why digital?

- Internet use **preference** (advanced BC) (Kemp et al., 2017)
- Preference for **home-based** interventions (advanced BC)
- Ease of delivery to **regional and remote** locations
- Potentially **less resource intensive**

Cost benefits? Cost-effective?

- Likely to be **cost-effective** compared with no intervention and doing something non-therapeutic (e.g., having a general discussion)
- Benefits include **sustainability** and **reduced waiting times**
- Factors influencing uptake of digital interventions include:
  - **increasing patient choice**
  - **reaching underserved** populations
  - **enabling continuous care**

(Gega et al., 2022)

Low intensity interventions

Increase access to **evidence-based** psychological therapies, using the **minimum level of intervention** necessary to create maximum gain

Delivery via flexible forms:

- email
- internet
- smartphone
- tablet
- print-based resources

Face-to-face vs Low intensity interventions

Face-to-face therapy	Low intensity interventions
High efficacy	Accessible
Low acceptability	Use fewer healthcare professional resources
Low uptake	Non-specialist practitioners to deliver
Low adherence	Greater uptake
Low accessibility	Greater adherence
Time and resource Intensive (particular challenges from pandemic)	Consistent with self-management
Delivered by specialist trained in psychotherapy	

(Beatty et al., 2016)

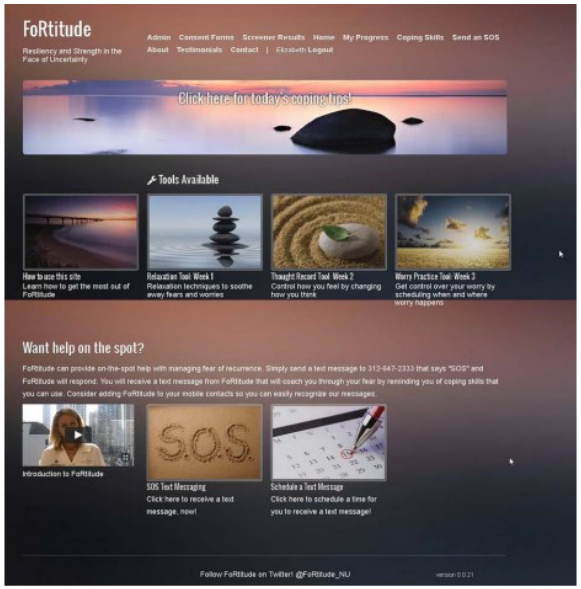
Managing Fear of Cancer Recurrence with Digital Intervention

Fear of Cancer Recurrence

- Most commonly reported **unmet need**
- Fear, worry or concern relating to the **possibility** that cancer will come back or progress
- **Existential threat**, including fear of suffering, being a burden on the family, missing key events, and ceasing to exist

Wagner et al., 2021 (JNCI)

FoRtitude intervention



Tailors **evidence-based CBT** strategies for anxiety to the management of FoR

Adapts these strategies for **eHealth delivery**

3 key strategies

- Relaxation
- Cognitive restructuring
- Worry practice

- Each module consisted of didactic lessons (10-15 screens)
- **Interactive** tools
- Interactive **text messaging** function

Wagner et al. (2021)

Wagner et al (2021) JNCI

After 4 weeks access

Significant reductions in FoR via self-efficacy

But so too did the **Control condition**

Telecoaching improved adherence and retention

Refused: *N* = 105

Too busy
N = 30

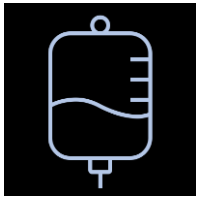
No Internet access
N = 20

No FCR concerns
N = 15

Not fluent in English
N = 7

Privacy concerns
N = 5

Do not want cancer reminder
N = 4



Too ill
N = 1

Do not like surveys
N = 1

No reason
N = 21

Online self-help training for FCR

PAPER

WILEY

No effect of CBT-based online self-help training to reduce fear of cancer recurrence: First results of the CAREST multicenter randomized controlled trial

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Funding information
Pink Ribbon, Grant/Award Number: 2012. WO43.C158

Abstract

Objective: Fear of cancer recurrence (FCR) is a common consequence of surviving cancer; therefore, easily accessible self-help training could help many cancer survivors deal with FCR at low costs. The CAncer REcurrence Self-help Training (CAREST) trial evaluates the effectiveness of an online-tailored self-help training on the basis of evidence-based cognitive behavioral therapy principles in breast cancer survivors. Also, possible predictors for benefitting from the online self-help training were examined.

Methods: This multicenter randomized controlled trial included 262 female breast cancer survivors, randomly assigned to either online self-help training (n = 130) or care as usual (CAU; n = 132). Participants completed questionnaires at baseline (T0), 3 months (T1; after intervention), and 9 months (T2). The primary outcome was FCR (Fear of Cancer Recurrence Inventory Severity subscale). Both effectiveness and predictors were analyzed with latent growth curve modeling (LGCM) according to the intention-to-treat principle.

Results: LGCM showed no differences between the average latent slope in both groups (χ^2_1 = .23, P = .63), suggesting that the treatments did not differ in their change in FCR over time. Moreover, no differences were found in the effects of the predictors on the latent slope in both groups (χ^2_1 = .12, P = .73), suggesting that no significant predictors were found for the effect of the intervention on FCR.

Conclusion: There was no effect of the CBT-based online self-help training "Less fear after cancer" in the current study. Therefore, we recommend adding professional support to online interventions for FCR.

(van Helmondt et al., 2019)

Why null effects?

- CBT **failed** to translate into online context
- **Intensity** inadequate?
- Entirely **self-directed** may not be sufficient to address FCR
- In contrast - a trial of a **blended intervention** (SWORD trial) with 5 **face-to-face** sessions combined with online exercises, was shown to be effective with enduring impact

(Butow, 2022)

SWORD trial – blended approach

VOLUME 35 · NUMBER 19 · JULY 1, 2017

JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Check for updates

Efficacy of Blended Cognitive Behavior Therapy for High Fear of Recurrence in Breast, Prostate, and Colorectal Cancer Survivors: The SWORD Study, a Randomized Controlled Trial

Marieke van de Wal, Belinda Thewes, Marieke Gielissen, Anne Speckens, and Judith Prins

Author affiliations and support information (if applicable) appear at the end of this article.

Published at jco.org on May 4, 2017.

Clinical trial information: NTR4423.

Corresponding author: Marieke van de Wal, Department of Medical Psychology, Radboud University Medical Center, PO Box 9101, 6500 HB Nijmegen, Netherlands; e-mail: marieke.vandewal@radboudumc.nl.

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0732-183X/17/3519w-2173w/$20.00

A B S T R A C T

Purpose
Fear of cancer recurrence (FCR) is a common problem experienced by cancer survivors. Approximately one third of survivors report high FCR. This study aimed to evaluate whether blended cognitive behavior therapy (bCBT) can reduce the severity of FCR in cancer survivors curatively treated for breast, prostate, or colorectal cancer.

Patients and Methods
This randomized controlled trial included 88 cancer survivors with high FCR (Cancer Worry Scale score ≥ 14) from 6 months to 5 years after cancer treatment. Participants were randomly allocated (ratio 1:1, stratified by cancer type) to receive bCBT, including five face-to face and three online sessions (n = 45) or care as usual (CAU; n = 43). Participants completed questionnaires at baseline (T0) and 3 months later (T1). The intervention group completed bCBT between T0 and T1. The primary outcome was FCR severity assessed with the Cancer Worry Scale. Secondary outcomes included other distress-related measures. Statistical (one-way between-group analyses of covariance) and clinical effects (clinically significant improvement) were analyzed by intention to treat.

Results
Participants who received bCBT reported significantly less FCR than those who received CAU (mean difference, –3.48; 95% CI, –4.69 to –2.28; $P < .001$) with a moderate-to-large effect size ($d = 0.76$). Clinically significant improvement in FCR was significantly higher in the bCBT group than in the CAU group (13 [29%] of 45 compared with 0 [0%] of 43; $P < .001$); self-rated improvement was also higher in the bCBT group (30 [71%] of 42 compared with 12 [32%] of 38 in the CAU group; $P < .001$).

Conclusion
bCBT has a statistically and clinically significant effect on the severity of FCR in cancer survivors and is a promising new treatment approach.

J Clin Oncol 35:2173-2183. © 2017 by American Society of Clinical Oncology

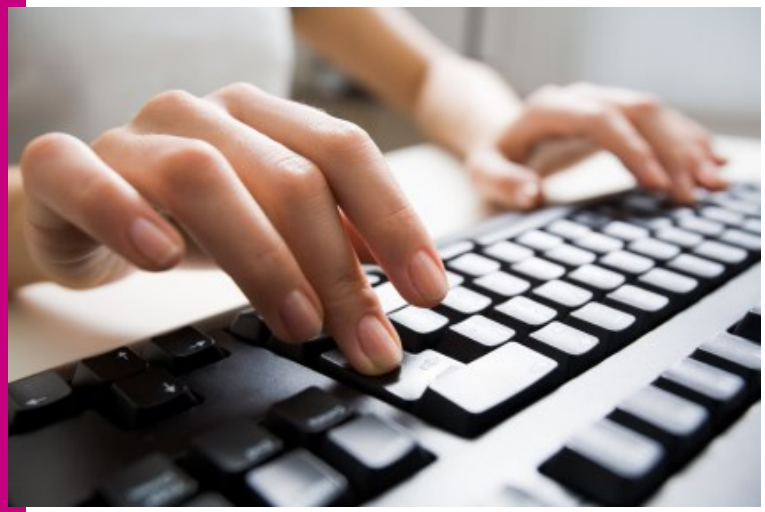
Managing Body Image Concerns

Body Image

- How one **sees or perceives one's body**
- Associated with **self-judgement**, **self-criticism** and comparison with others
- Not just appearance, but also body **function** (e.g., fatigue, pain)

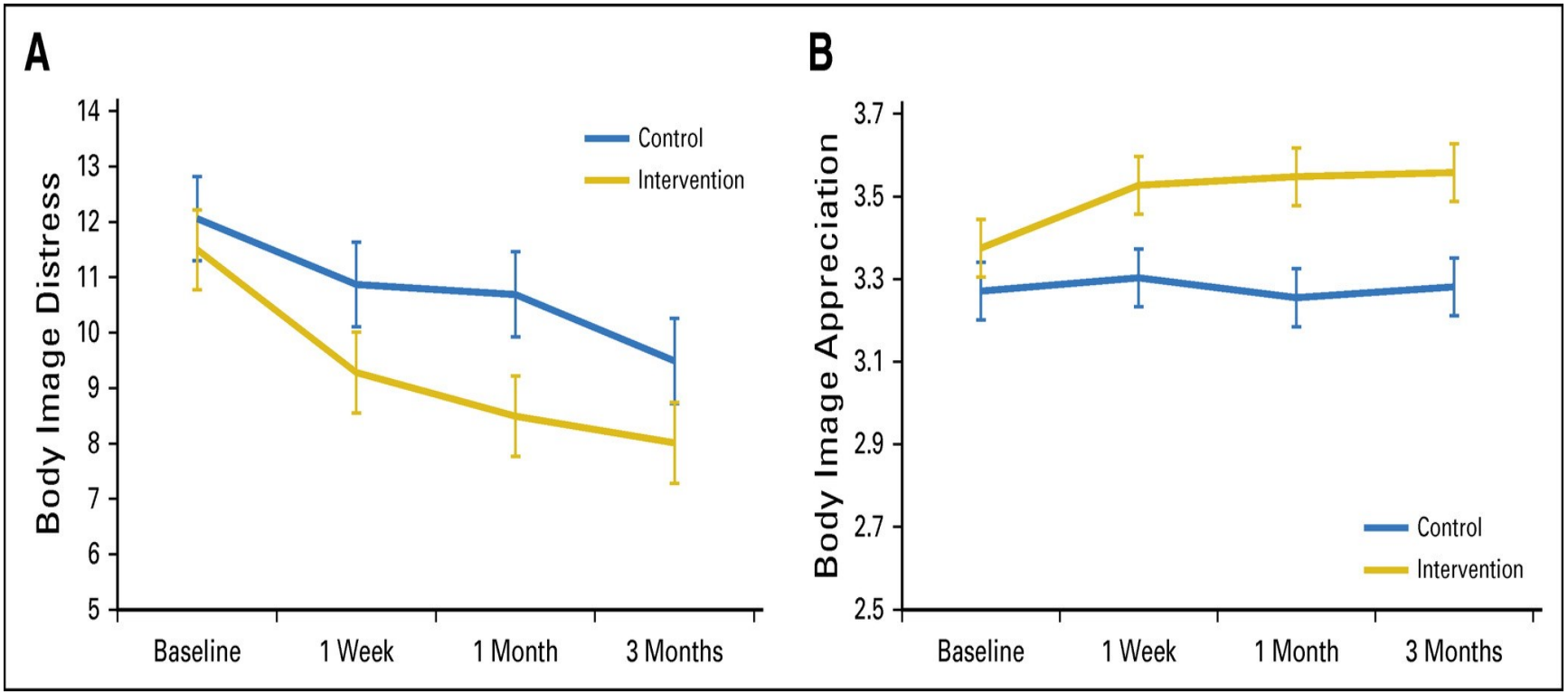
My Changed Body

- Modified **expressive writing** activity (Pennebaker, 1997)
- **Online**
- Write about a **distressing** event related to their body post-cancer
- Follow **self-compassionate** prompts to structure writing and reframe their perspective on body changes (Przezdziecki, Alcorso, Sherman, 2015).



……Can be written in any language

Body image benefits



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i-ReBIC

- **Online** version of the empirically tested face-to-face **group therapy** intervention Esplen et al (year) - Restoring Body Image after Cancer (ReBIC)
- 8-week intervention x 90-minute weekly text-based **online discussions**
- New topic each week:
  - reconnecting to the body
  - adjusting to a post-cancer identity
  - improving psychosexual functioning
- **Homework** assignments - readings, guided imagery exercises, journaling

(Trachtenberg et al., 2019

i-ReBIC

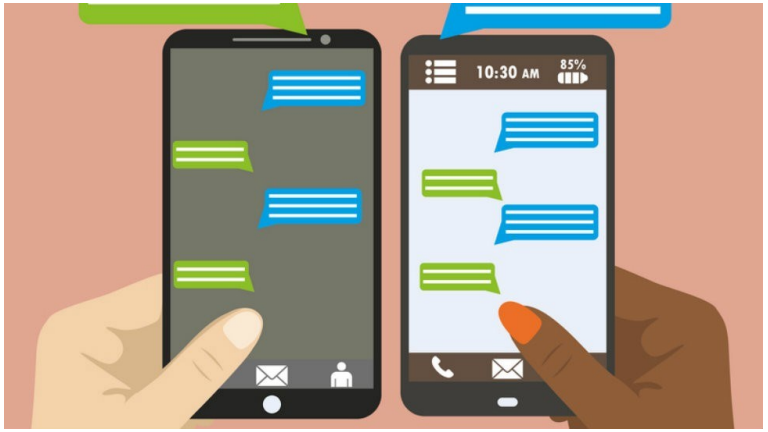
- **Significant** improvements in body image distress and experience of embodiment
- 93% of participants (n = 41) **satisfied**
- Majority of participants reported:
  - feeling a sense of **relief** from the intervention (82%)
  - feeling **understood** by others (82%)
  - cared for (82%)
  - that they could speak openly about difficult topics (84%)
  - that facilitators helped direct and focus group discussions (98%)
- 30% - reported that the discussion pace was **too fast**
- **Younger** participants were more likely to drop out of the study

(Trachtenberg et al., 2019)

Text message intervention to support healthy lifestyle practices for breast cancer patients

EMPOWER-SMS

- Mobile health (mHealth)
- Highly **accessible**
- Widest **reach** of all digital interventions
- Very **low cost**
- Health information and education
- Encouragement to set, achieve and track health goals
- Globally > **5 billion** mobile phone users from urban and rural communities



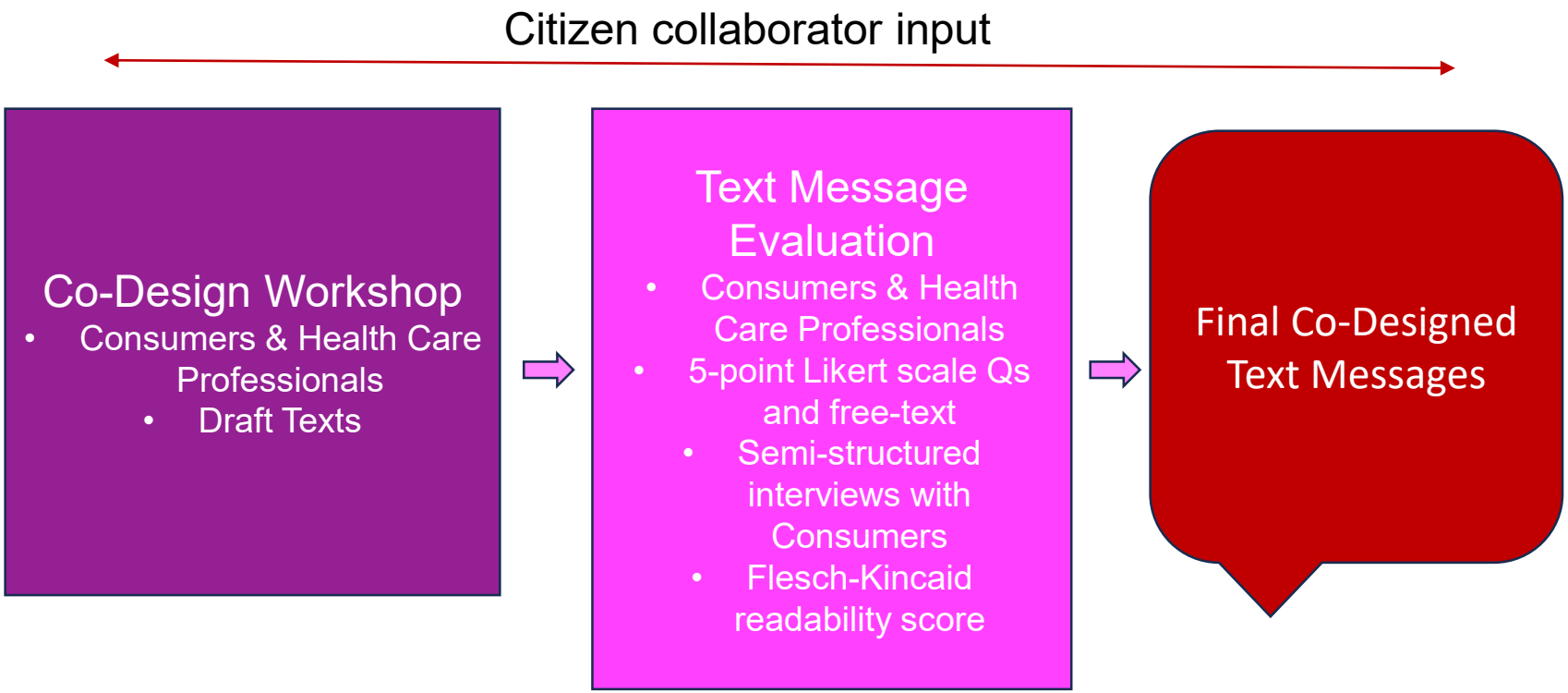
Singleton et al. (2022)

Co-design approach

- Service providers and consumers collaborate to develop meaningful and **creative solutions**
- Reflects l**ived experiences**
- Benefits include:
  - improved services
  - provider-consumer interactions
  - consumer engagement and experiences

- **Citizen collaborator** as an active member of the research team from study conception to final dissemination

EMPOWER-SMS messages development



EMPOWER-SMS messaging

Prompting intention formation: Sometimes we can do exercise without noticing - challenge yourself to park the car further away from the shops or your work so you get a few extra steps!

Self-care: Practicing positive self-talk is a good way to keep your mind healthy and improve your mood - not sure where to start? Click for more information: [insert link here]

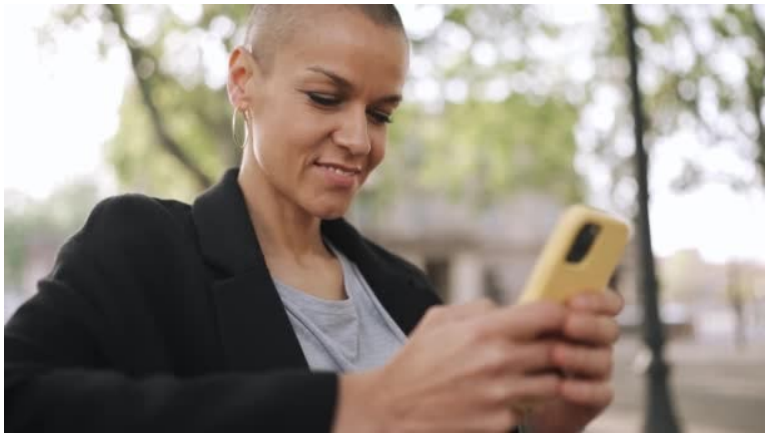
Setting graded tasks: Sometimes getting started is the hardest part, [pref_name] - it can be easier to begin exercise at low intensity (walking, stretching) and gradually increase to moderate intensity (faster breathing rate but can still have a conversation)

User acceptability

- Participants reported messages were
  - easy to understand (100%),
  - **useful** (91%)
  - **motivating** (67%).

- Participants particularly liked the positively-framed text messages, finding the program gave them a **sense of support**

- **Older** participants were more likely to decline the study, who cited technology barriers



Singleton et al. (2021)

Digital Interventions for Managing Psychological Concerns

J Clin Oncol 2022

review articles

Electronic Health Interventions for Patients With Breast Cancer: Systematic Review and Meta-Analyses

Anna C. Singleton, PhD[1]; Rebecca Raeside, MPH[1]; Karice K. Hyun, PhD[1,2]; Stephanie R. Partridge, PhD[1,3]; Gian Luca Di Tanna, PhD[4]; Nashid Hafiz, MIPH[1]; Qiang Tu, PhD[1]; Justin Tat-Ko, BMSc[1]; Stephanie Che Mun Sum, BMSc[1]; Kerry A. Sherman, PhD[5]; Elisabeth Elder, MBBS, PhD[6,7]; and Julie Redfern, PhD[1,4]

Do digital interventions improve patient reported outcomes?

During and after breast cancer treatment

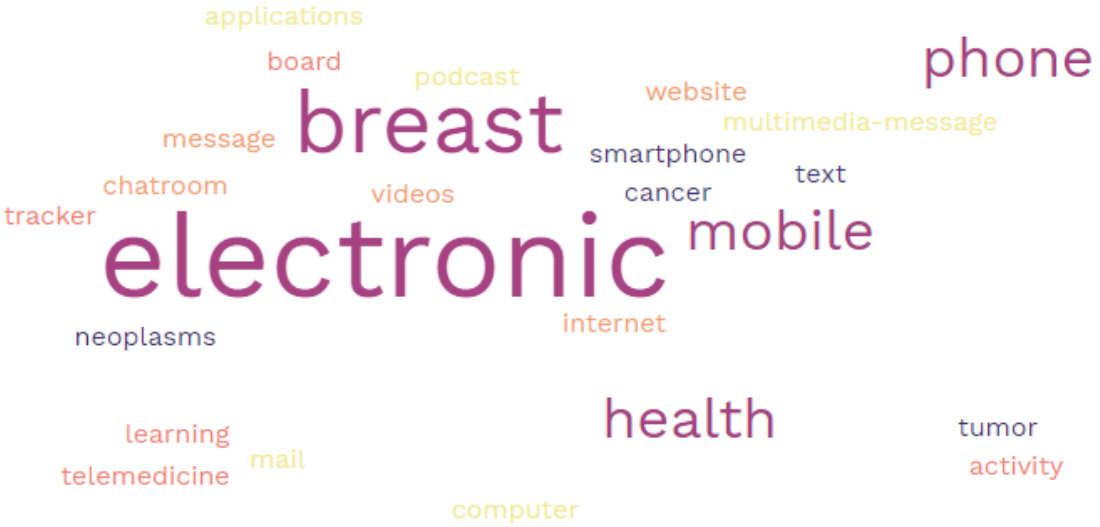
PROs

RE-AIM framework

- Reach
- Effectiveness
- Adoption
- Implementation
- Maintenance

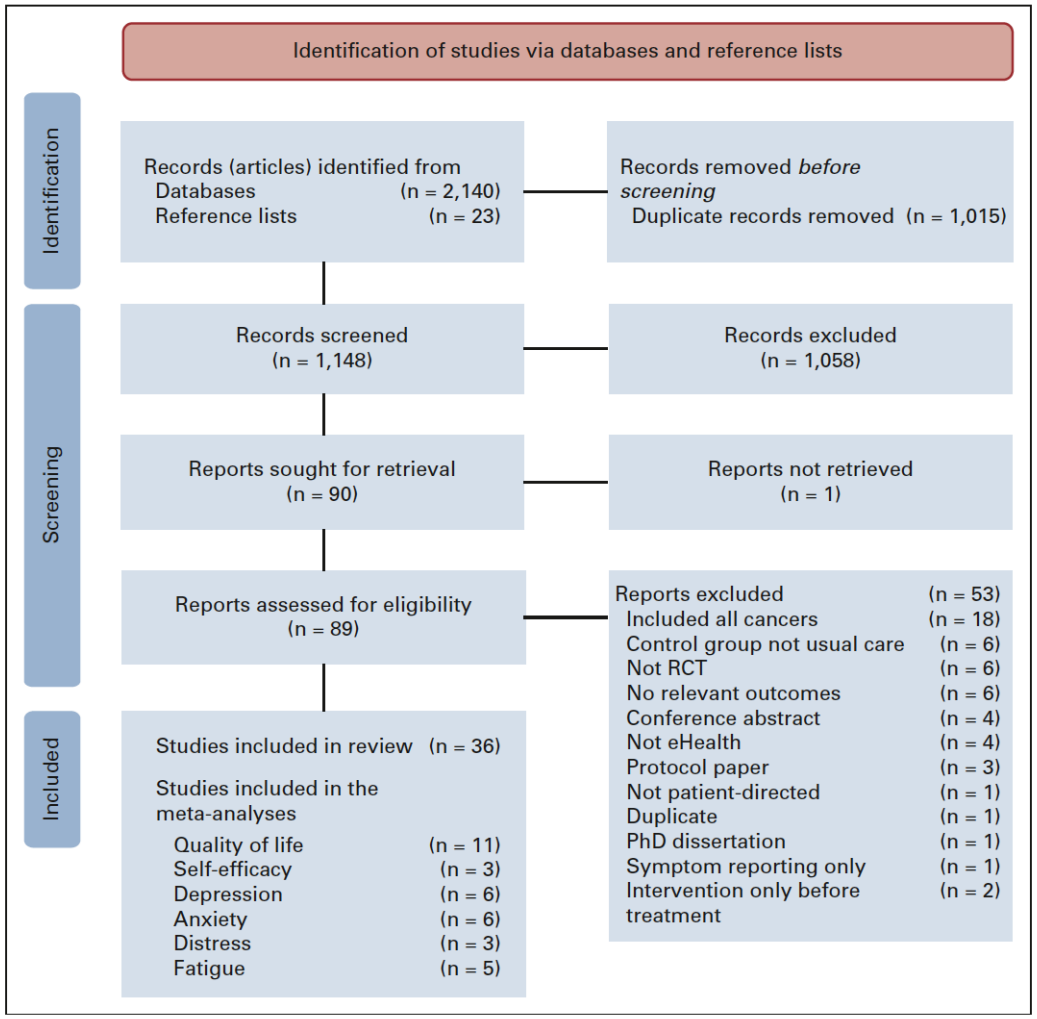
Methods

- Systematic review and meta-analysis
- PRISMA guidelines



Population	Adults (age at least **18 years**, female or male) **breast cancer** diagnosis undergoing or completed active breast cancer treatment
Intervention	**Patient-directed** eHealth interventions (email, videoconference, videos, activity trackers, website, podcast, chatroom, mobile app, text messages)
Comparator	Standard care or control intervention (i.e., internet access)
Outcomes	health-related QoL self-efficacy mental (anxiety, depression, distress) physical (physical activity, nutrition, fatigue)
Setting	**RCTs** in any setting

What was included?



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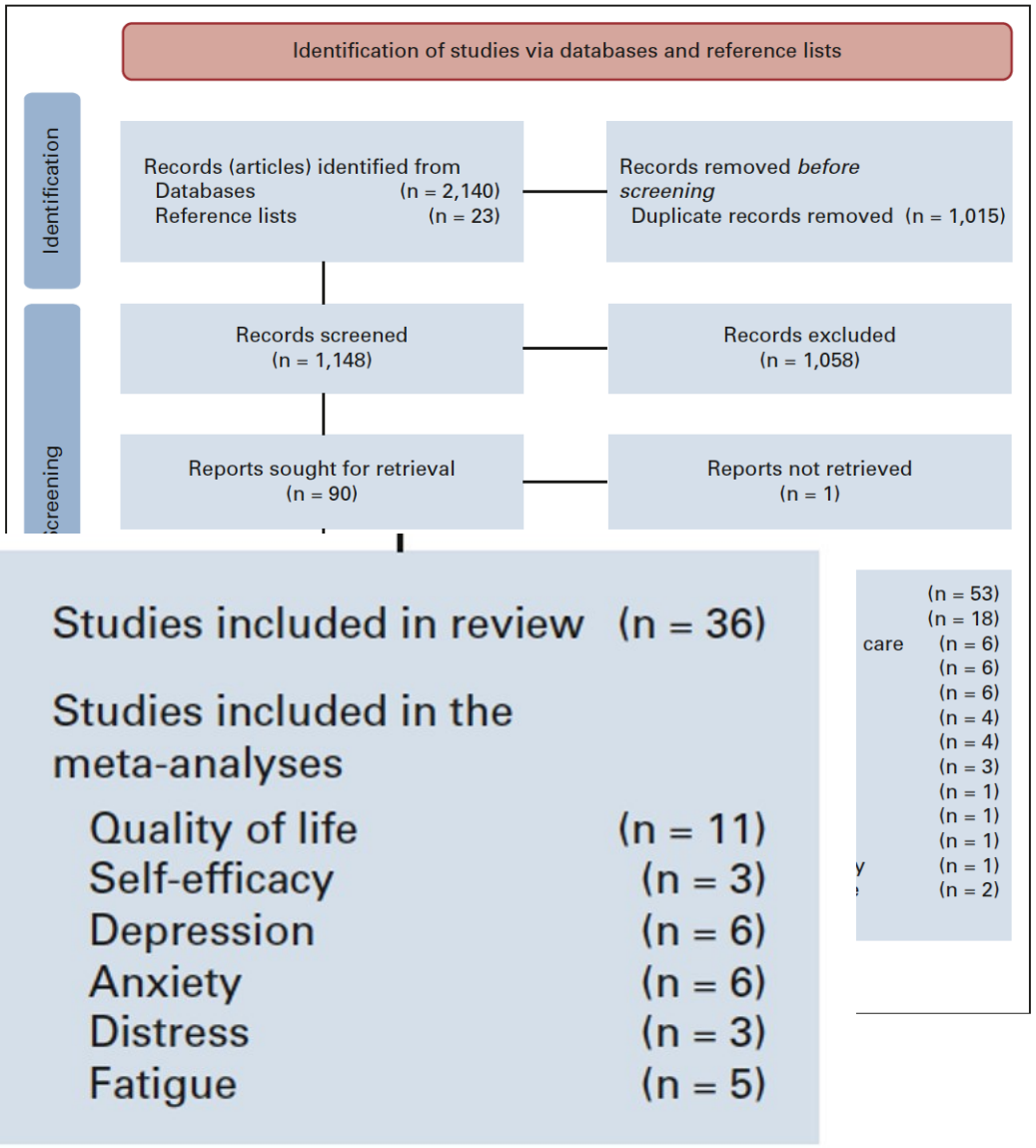


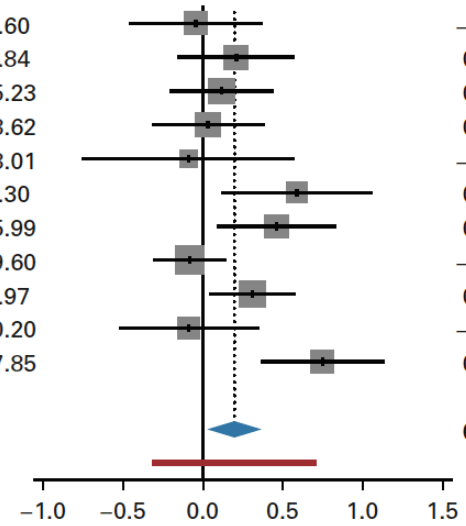
Quality of Life

↑0.2 SMD

A

Author	Intervention No.	Intervention Mean	Intervention SD	Control No.	Control Mean	Control SD	SMD	95% CI	Weight, %
Ryhänen et al[60]	47	6.50	1.42	43	6.57	1.60	−0.05	−0.46 to 0.37	8.3
Carpenter et al[39]	57	18.80	3.77	59	18.00	3.84	0.21	−0.16 to 0.57	9.3
Van Den Berg et al[62]	70	72.50	18.57	80	70.52	15.23	0.12	−0.20 to 0.44	10.4
Admiraal et al[35]	62	74.33	30.36	63	73.41	28.62	0.03	−0.32 to 0.38	9.7
Ferrante et al[42]	18	100.33	42.26	17	104.12	38.01	−0.09	−0.76 to 0.57	4.6
Kim et al[53]	34	74.90	3.50	38	72.20	5.30	0.59	0.12 to 1.06	7.2
Zhu et al[69]	57	92.87	21.39	57	84.09	15.99	0.46	0.09 to 0.83	9.2
White et al[66]	157	107.90	19.20	142	109.50	19.60	−0.08	−0.31 to 0.14	12.8
Kim et al[54]	105	3.18	0.82	112	2.90	0.97	0.31	0.04 to 0.58	11.7
Vallance et al[61]	40	103.50	24.50	40	105.50	20.20	−0.09	−0.53 to 0.35	7.8
Zhou et al[68]	56	117.31	11.41	55	106.06	17.85	0.75	0.36 to 1.13	8.9
Random-effects model	.			.			**0.20**	**0.03 to 0.36**	**100.0**
Prediction interval								**−0.32 to 0.71**	

Heterogeneity: $I^2 = 57\%$, $\tau^2 = 0.0440$, $P < .01$

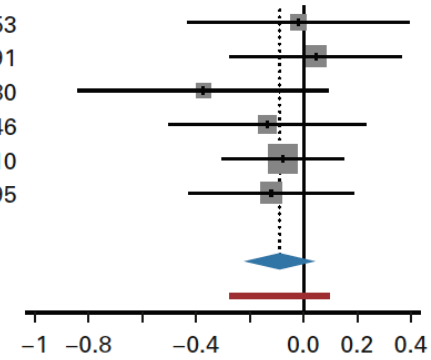


Anxiety symptoms

B

Author	Intervention No.	Intervention Mean	Intervention SD	Control No.	Control Mean	Control SD	SMD	SMD	95% CI	Weight, %
Ryhänen et al[60]	47	1.88	0.47	43	1.89	0.53		−0.02	−0.43 to 0.39	10.2
Hummel et al[52]	69	6.02	3.46	82	5.85	3.91		0.05	−0.27 to 0.37	17.0
Kim et al[53]	34	40.60	3.60	38	42.00	3.80		−0.37	−0.84 to 0.09	8.0
Zhu et al[69]	57	9.93	2.72	57	10.28	2.46		−0.13	−0.50 to 0.23	12.9
White et al[66]	157	6.20	3.70	142	6.50	4.10		−0.08	−0.30 to 0.15	33.8
Atema et al[36]	81	5.76	3.95	80	6.24	3.95		−0.12	−0.43 to 0.19	18.2
Random-effects model								**−0.09**	**−0.22 to 0.04**	**100.0**
Prediction interval									**−0.28 to 0.10**	

Heterogeneity: $I^2 = 0.0000\%$, $\tau^2 = 0$, $P = .80$

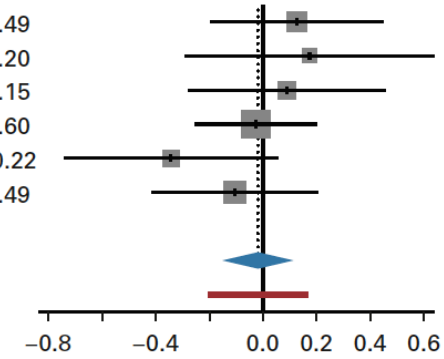


Depressive symptoms ✗

C

Author	Intervention No.	Intervention Mean	Intervention SD	Control No.	Control Mean	Control SD	SMD	SMD	95% CI	Weight, %
Hummel et al[52]	69	4.55	3.81	82	4.09	3.49		0.13	−0.19 to 0.45	16.8
Kim et al[53]	34	15.70	3.70	38	14.90	5.20		0.17	−0.29 to 0.64	8.0
Zhu et al[69]	57	12.75	1.57	57	12.58	2.15		0.09	−0.28 to 0.46	12.8
White et al[66]	157	3.40	3.50	142	3.50	3.60		−0.03	−0.26 to 0.20	33.5
Lally et al[56]	57	10.22	8.84	43	13.50	10.22		−0.34	−0.74 to 0.05	10.8
Atema et al[36]	81	3.90	3.49	80	4.27	3.49		−0.11	−0.41 to 0.20	18.1
Random-effects model	.			.				**−0.02**	**−0.15 to 0.11**	**100.0**
Prediction interval									**−0.21 to 0.17**	

Heterogeneity: $I^2 = 0.0000\%$, $\tau^2 < 0.0001$, $P = .46$



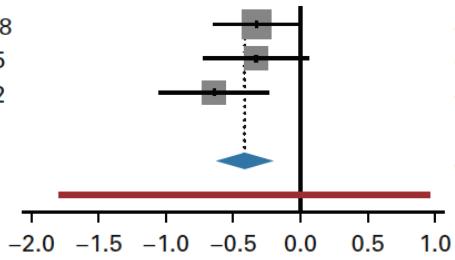
Psychological distress

↓ 0.41 SMD

D

Author	Intervention No.	Intervention Mean	Intervention SD	Control No.	Control Mean	Control SD	SMD	SMD	95% CI	Weight, %
Van Den Berg et al[62]	70	124.90	26.96	80	135.84	37.98		−0.33	−0.65 to 0.00	43.5
Admiraal et al[35]	49	4.02	3.47	51	5.24	3.85		−0.33	−0.72 to 0.06	29.1
Lally et al[56]	57	2.66	2.44	43	4.32	2.72		−0.64	−1.05 to −0.24	27.5
Random-effects model	.			.				**−0.41**	**−0.63 to −0.20**	**100.0**
Prediction interval									**−1.79 to 0.97**	

Heterogeneity: $I^2 = 0.0000\%$, $\tau^2 = 0$, $P = .43$



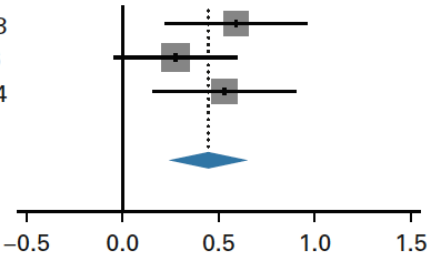
Self-efficacy

↑ 0.45 SMD

E

Author	Intervention No.	Intervention Mean	Intervention SD	Control No.	Control Mean	Control SD	SMD	SMD	95% CI	Weight, %
Carpenter et al[39]	57	228.80	27.93	59	212.50	26.88		0.59	0.22 to 0.96	30.1
Van Den Berg et al[62]	70	21.03	3.22	80	20.23	2.56		0.28	−0.05 to 0.60	40.1
Zhu et al[69]	57	227.12	66.80	57	197.07	43.44		0.53	0.16 to 0.90	29.8
Random-effects model	.			.				**0.45**	**0.24 to 0.65**	**100.0**
Prediction interval									**−0.88 to 1.77**	

Heterogeneity: $I^2 = 0\%$, $\tau^2 < 0.0001$, $P = .40$



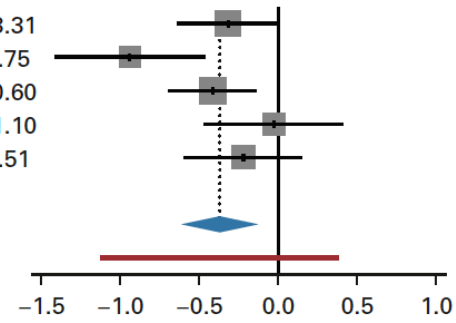
Fatigue

↓0.37 SMD

F

Author	Intervention No.	Intervention Mean	Intervention SD	Control No.	Control Mean	Control SD	SMD	SMD	95% CI	Weight, %
Van Den Berg et al[62]	70	28.57	12.91	80	32.77	13.31		−0.32	−0.64 to 0.00	22.6
Galiano-Castillo et al[45]	39	2.34	2.06	37	4.64	2.75		−0.94	−1.42 to −0.47	15.4
Zachariae et al[67]	103	11.20	8.50	100	15.20	10.60		−0.42	−0.69 to −0.14	25.2
Vallance et al[61]	40	14.00	8.90	40	14.30	11.10		−0.03	−0.47 to 0.41	16.9
Zhou et al[68]	56	2.29	2.23	55	2.82	2.51		−0.22	−0.60 to 0.15	19.9
Random-effects model	.			.				**−0.37**	**−0.61 to −0.13**	**100.0**
Prediction interval									**−1.13 to 0.38**	

Heterogeneity: I^2 = 53.7989%, τ^2 = 0.0408, P = .07



User Experience

Reach
72-93% eligible enrolled
10 languages
>50% some uni educ

Acceptability
Acceptable
Useful
Easy to use
Video components

Engagement
Accessed at least once
Dropped over time
Repeated HP contact
29-100% adherence
Side effects
Healthy living
General advice
Interactive features (blog posts, email contact, incentives)

Future Digital Interventions

- **Reflect patient preferences,**
- **Practical disease- and health-management information via videos and written material**
- **Social support opportunities**
- **Optional communication features**

Interventions co-designed with end users may improve engagement

Final thoughts

Digital interventions provide an **easy-to-access** and **low cost** approach to providing **support** for individuals with breast cancer

Mange tak!