Received: 10 December 2023 | Revised: 21 February 2024 | Accepted: 11 March 2024

DOI: 10.1111/ajco.14060

ORIGINAL ARTICLE

Implementing a group-based online mental well-being program for women living with and beyond breast cancer – A mixed methods study

Natalie Tuckey[1,2] | **Joep van Agteren**[1] | **Anna Chur-Hansen**[2] | **Kathina Ali**[3] | **Daniel B. Fassnacht**[3] | **Lisa Beatty**[4] | **Monique Bareham**[5] | **Hannah Wardill**[6,7] | **Matthew Iasiello**[1]

[1]Mental Health and Well-being Program, Lifelong Health Theme, South Australian Health and Medical Research Institute, Adelaide, Australia

[2]School of Psychology, Faculty of Health and Medical Sciences, University of Adelaide, Adelaide, Australia

[3]School of Health, University of the Sunshine Coast, Queensland, Australia

[4]Flinders University Institute of Mental Health & Well-being, College of Education, Psychology and Social Work, Flinders University, Adelaide, Australia

[5]Patient Advocate and Cancer Survivor - SA 2022 Local Hero, Adelaide, Australia

[6]Supportive Oncology Research Group, Precision Medicine Theme (Cancer Program), The South Australian Health and Medical Research Institute, Adelaide, Australia

[7]School of Biomedicine, Faculty of Health and Medical Sciences, The University of Adelaide, Adelaide, Australia

Correspondence
Natalie Tuckey, School of Psychology, Faculty of Health and Medical Sciences, University of Adelaide, Adelaide, South Australia, Australia.
Email: Natalie.tuckey@sahmri.com

Funding information
SAHMRI; Hospital Research Foundation Group

Abstract

Purpose: There is a gap in available mental well-being services in Australia for women diagnosed with breast cancer. This pilot mixed-methods uncontrolled study aimed to assess the feasibility of an online mental health and well-being intervention, the Be Well Plan (*BWP*), which enables participants to create a personalized, flexible well-being strategy.

Methods: Women diagnosed with stages I-IV breast cancer were recruited into 4 asynchronous groups to participate in the *BWP*, a 5-week facilitator-led group-based mental health and well-being program. Psychological measures used at baseline and post-intervention included: the Warwick Edinburgh Mental Well-Being Scale, Brief Resilience Scale, Self-compassion Scale, 9-item Patient Health Questionnaire, 7-item General Anxiety Disorder scale, and EORC QLQ-C30. Multivariate analysis of variance and effect sizes were calculated on pre- and post-psychological measures, followed by qualitative content analysis on post-completion interviews with participants.

Results: Nineteen women (mean age 45.7, standard deviation = 7.74) were included in the study. Large effect sizes were reported for mental well-being, depressive symptoms, and anxiety (partial $\omega^2 = 0.28$, 0.21, and 0.20, respectively). Self-compassion, resilience, and quality of life results were not statistically significant. Qualitative content analysis provided insight into experiences with *Program Delivery Experience*,

---

Co-final HannahWardill and Matthew Iasiello author.

Application of the BWP, Mental Health Improvements, Supporter Involvement, Adopted Interventions, and *Recruitment*. Participants reported benefits in mindfulness, grounding techniques, and physical activities.

Conclusion: The BWP has the potential to be an effective intervention to support the mental health and well-being of breast cancer survivors.

Implications for cancer survivors: This study highlights flexible interventions that accommodate the diverse needs of breast cancer survivors to improve mental well-being and alleviate psychological distress.

KEYWORDS
breast cancer, mental health, survivorship, well-being

1 INTRODUCTION

With over 2.3 million women diagnosed in 2020 internationally, breast cancer has become the most prevalent cancer for women.[1] Supporting the mental health and well-being of cancer survivors is a growing field of interest due, in part, to the increased demand for different types of support by breast cancer survivors.[2,3] With increasing survival rates,[1,4] there is a clear demand for survivorship care, which is the process that commences after a cancer diagnosis,[5] and facilitates the transition from focusing on disease treatment to health maintenance.[6] Research shows that approximately 40% of survivors of breast cancer experience clinically significant psychological distress (i.e., symptoms of depression and anxiety),[7] which is influenced by physical side effects, social implications, and reduced quality of life (QoL).[3,6] Additionally, managing breast cancer survivorship is important to adapt to the physical and psychological long-term side effects of treatment, as well as to promote positive behavioral factors including healthy lifestyle, treatment adherence, and secondary prevention.[2,8]

Due to the increasing number of breast cancer survivors and the duration of survivorship, it is argued by Vardy et al.[9] that a more sustainable model of healthcare services is needed. A recent study by Keesing et al.[10] in Australia examined the adequacy of healthcare services for breast cancer survivors who had received a breast cancer diagnosis and completed active treatment within the previous five years. The study reported a variety of physical, psychological, and emotional unmet needs of women and their partners as they transitioned into survivorship with ongoing difficulties returning to previous roles, employment, hobbies, and intimacy with their partner, ultimately affecting their well-being. Furthermore, a recent systematic review of cancer survivorship found efforts are still required to support the health and mental well-being of cancer survivors.[11] It is argued that increased efforts are needed to promote the well-being of survivors and their caregivers to support them in transitioning into mainstream life and enjoying a better QoL.[12] Additionally, there is a lack of post-treatment pathways for rural and regional populations across Australia with a large burden continuing to be placed on the person and their families to travel for services despite an increase in internet reliance for information and services.[13]

Typically, mental health cancer research focuses on indicators of psychological distress and QoL,[14] with less attention being paid to indicators of *positive* mental health, despite the fact that it offers a different approach to building someone's psychological health, which may be particularly suited to breast cancer survivors. Positive mental health is an umbrella term that refers to various psychological constructs that are associated with positive functioning, including eudaimonic well-being (which includes areas such as personal fulfillment, meaning and purpose, and mastery) and hedonic well-being (which includes areas such as life satisfaction and positive emotions)[15] as well as resilience (which captures an individual's ability to draw upon resources to overcome adversity).[16]

Mental health and well-being programs can be a scalable way to address the current gap in mental well-being services for breast cancer survivors, which may be delivered without requiring clinical resources, as demonstrated among other vulnerable groups.[17,18] While these have largely been delivered in face-to-face settings, Leslie et al.[19] showed that internet-delivered interventions have merit in ameliorating symptoms of psychological distress associated with cancer survivorship. Effective online interventions may be designed to be self-directed such as *Finding My Way*, and *Finding My Way-Advanced*,[20] however those seeking connection within online programs may prefer programs with more facilitator involvement.[19] The *Be Well Plan* (*BWP*) is a facilitator-led group-based mental health and well-being program designed to help individuals develop their own well-being strategy.[21] The *BWP* has already been demonstrated to be effective at improving mental health outcomes including mental well-being, resilience, and reducing symptoms of depression, stress, and anxiety across different population groups in the general community (non-cancer) and has been tested previously under RCT conditions.[22,23]

This mixed-method pilot study had two aims: the first aim was to assess the feasibility of an online group-based mental health and well-being program—the *BWP*. Feasibility was measured by attendance rate and improving the mental health outcomes of those living with and beyond breast cancer. The second aim was to qualitatively explore the experiences of participants with the goal of optimizing this program for follow-up studies and enhancing implementation.

2 | MATERIALS AND METHODS

2.1 | Study design

A pilot pre-post study was conducted to assess the feasibility of the *BWP* in a clinical setting, specifically to improve the mental well-being of women living with or beyond breast cancer. While this study was primarily designed to test the effectiveness of mental health outcomes, the attendance rate was the primary feasibility outcome, with a secondary focus on qualitative outcomes. Ethics approval was granted by Flinders University HREC Sub-committee #4866 and noted by the University of Adelaide HREC Sub-committee #36368. Participants provided informed consent prior to commencing the study.

2.2 | Participants and recruitment

Women diagnosed with stages I-IV breast cancer across Australia were invited to take part in the *BWP*. Inclusion criteria were as follows: women diagnosed with breast cancer in the last 3 years, age 18 years and older, internet access, and fluent in English. Recruitment of participants was via social media, through Cancer Voices South Australia and the South Australian Health and Medical Research Institute, which included a webpage containing a video introducing the study and detailed information about the project.

2.3 | BWP intervention

The *BWP* is a weekly, 5-session group-facilitated mental health and well-being program.[22,23] Participants develop their own well-being plan, using evidence-based activities that participants choose to best suit them and their current situation.[22] The program is delivered in a group-based setting either online or face-to-face, allowing for cost-effective delivery to large numbers of people in need, and in remote and hard-to-reach settings. At the commencement of the *BWP*, participants are invited to complete a brief survey called the *Be Well Tracker*, an element of the intervention that aims to provide participants with insight into their own mental well-being. After completing the survey, participants receive a detailed report about their levels of well-being, resilience, and distress, which provides them with psychological insights they could use within the program. Participants are then introduced to 30 evidence-based activities and skills to improve their mental health and well-being, which are drawn from a number of evidence-based approaches including Cognitive Behavioural Therapy (CBT), Acceptance and Commitment Therapy (ACT), mindfulness, and positive psychology.[24] The weekly facilitator-led group sessions follow a format consisting of psychoeducation, self-reflection, and sharing between participants. Outcomes from the *Be Well Tracker* were used within the intervention only, not for examining the feasibility of this study. Further information and details about the *BWP* program can be found in van Agteren et al.[23]

2.4 | Procedure

A consultation process was undertaken prior to the commencement of this study to ensure all study materials and training content were adapted in a way that would be appropriate for breast cancer survivors. Meetings were held with five individuals with lived experience (survivors and caregivers) via the Health Translation SA Consumer Engagement Group as well as clinicians, researchers, and lived experience representatives from the Primary Care Collaborative Cancer Clinical Trials Group (PC4) Consumer Group. They provided critical insight into the way the program recruited participants and inclusion criteria in the study. No changes to the *BWP* intervention were necessary for this study.

Participants completed an online expression of interest including general demographic questions (age, gender, employment status, breast cancer diagnosis, treatment history, mental health support), preferences of the *BWP* (online or face to face, time of attendance), interest in bringing a support person and the mental health continuum short form (MHC-SF).[25] Once participants provided their informed consent they were invited to complete an online baseline assessment on measures detailed below.

Participants who completed the online baseline assessment received a welcome email the week prior to the intervention, inviting them to participate in the 2 h, group-based program for five consecutive weeks via Zoom (10 h in total). Prior to week 1, a hardcopy workbook was posted to participants and they were invited to download the *Be Well App*; a well-being scheduling tool used to complement the *BWP*. In total, four groups (Group 1 $n = 7$, Group 2 $n = 6$, Group 3 $n = 4$, and Group 4 $n = 5$) were delivered online via Zoom to increase accessibility for participants across Australia and to be considerate of local coronavirus disease 2019 and Influenza outbreaks. All groups were facilitated by a trained *BWP* facilitator and supported by a person with lived experience as a breast cancer survivor who had previously participated in the *BWP*.

Following the completion of the *BWP*, participants were asked to complete the post-intervention assessment. Up to three email reminders were sent to participants to complete the assessment. Participants were also invited to attend a follow-up interview online via Zoom within 2 months of completing the program, to provide qualitative feedback on the program. The 1-hour semi-structured interview involved questions about participants' overall experience, outcomes from the program, facilitation, format, and the involvement of a support person.

2.5 | Measures

2.5.1 | Mental well-being

The primary outcome of the current study was mental well-being, measured using the Warwick-Edinburgh Mental Well-being Scale[26] which contains 14 questions and was used to assess eudaimonic and hedonic aspects of well-being. It is scored on a 6-point Likert scale (0 = none of the time to 5 = all of the time) which asks participants to indicate how often, over the past 2 weeks, they have experienced different thoughts and feelings (e.g., "I've been feeling optimistic about the future"). Total scores range from 0 to 70, with higher scores indicating greater levels of mental well-being.

2.5.2 | Resilience

The Brief Resilience Scale contains six questions and is used to assess the ability to bounce back and recover from stress[27] (i.e., "I tend to bounce back quickly after hard times"). It is scored on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree), with some reverse coded items.

2.5.3 | Self-compassion

Containing 12 questions, the Self Compassion Short Form was used to measure self-compassion.[28] Participants respond on a 5-point Likert scale from 1 (almost never) to 5 (almost always), indicating how often they behaved in a stated manner (e.g., "When I fail at something important to me I become consumed by feelings of inadequacy").

2.5.4 | Depression and anxiety

Depressive symptoms
Symptoms of depression were assessed using the 9-item Patient Health Questionnaire (PHQ-9).[29] It is scored on a 4-point Likert scale (0 = not at all to 3 = nearly every day) and allows participants to report how often, over the past 2 weeks, they have experienced depressive symptoms (e.g., "Feeling negative about yourself or that you are a failure or have let yourself or your family down"). Total scores range from 0 to 27, with higher scores indicating greater levels of depressive symptoms.

Anxiety
Anxiety was assessed using the 7-item General Anxiety Disorder scale (GAD-7).[30] Participants respond on a 4-point Likert scale (0 = not at all to 3 = nearly every day) on how often they have experienced symptoms of anxiety (e.g., "Worrying too much about different things") over the past 2 weeks. Total scores range from 0 to 21, with higher scores indicating greater levels of anxiety.

2.5.5 | Health-related QoL

Quality of life
Health-related QoL was measured using the health-related QoL questionnaire (EORTC QLQ-C30), consisting of 30 items.[31] The EORTC QLQ-C30 has five functioning scales (physical, role, cognitive, emotional, and social), three symptom scales (fatigue, nausea/vomiting, and pain), and single symptom items (dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties). A 4-point Likert scale (1 = not at all, 2 = a little bit, 3 = quite a bit, and 4 = very much) was used to rate each item. Two global questions are also included that use a 7-point Likert scale (1 = very poor and 7 = excellent) to generate a global health status/QoL score. The summary score was calculated by calculating the mean of questions 29 (How would you rate your overall health during the past week?) and question 30 (How would you rate your overall QoL during the past week?), according to the EORTC scoring manual. Higher functioning and global health status/QoL scores indicate better health-related QoL, while higher symptom scores indicate more severe symptoms.

2.6 | Data analysis

2.6.1 | Quantitative analysis

Qualtrics software was used to collect survey responses, while IBM SPSS Statistics v27 was used to conduct the statistics analysis. A power analysis on the outcome of well-being shows that a sample size of 12 participants would be sufficient to demonstrate an effect size of 0.8, assuming a one-tailed test, statistical power of 0.80, and Cronbach's α of 0.05. Multivariate analysis of variance (MANOVA) was used to analyze pre- and post-intervention differences in outcome measures.[32] All participants who commenced the 5-week program were included in the analysis. The significance level was set at $p < 0.05$. Partial omega squared (ω^2) was calculated to estimate the effect size, which is robust to use in small samples.[33] Field[34] has provided benchmarks to define small ($\omega^2 < 0.06$), medium ($0.06 < \omega^2 < 0.14$), and large ($\omega^2 > 0.14$) effects.

Within-individual changes in outcomes were assessed by calculating a Reliable Change Index (RCI) using the traditional method for assessment of reliable change as suggested by Jacobson and Truax.[35] The RCI was calculated by subtracting an individual's post-intervention score from their baseline score and subsequently dividing this difference score by the standard error of the difference for the measurements used. The standard error of the difference was calculated using the following formula:

$$\mathrm{SE_{diff}} = \mathrm{SD_x} * \sqrt{(1 - \mathrm{r_{xx}})},$$

where $\mathrm{SD_x}$ refers to the standard deviation of the difference scores and $\mathrm{R_{xx}}$ refers to the correlation between scores on the pre and post-measurements. Any change larger than 1.96 (2 SDs) was considered a reliable change. Minimal Clinically Important Differences (MCID) were calculated for depression and anxiety, using change scores defined by Kounali et al.[36] (MCID in PHQ-9 and GAD7 as −1.7 and −1.5, respectively).

2.6.2 | Qualitative analysis

Qualitative content analysis was used to categorize the data from the interviews (e.g., "*What were your thoughts on the Be Well Plan*

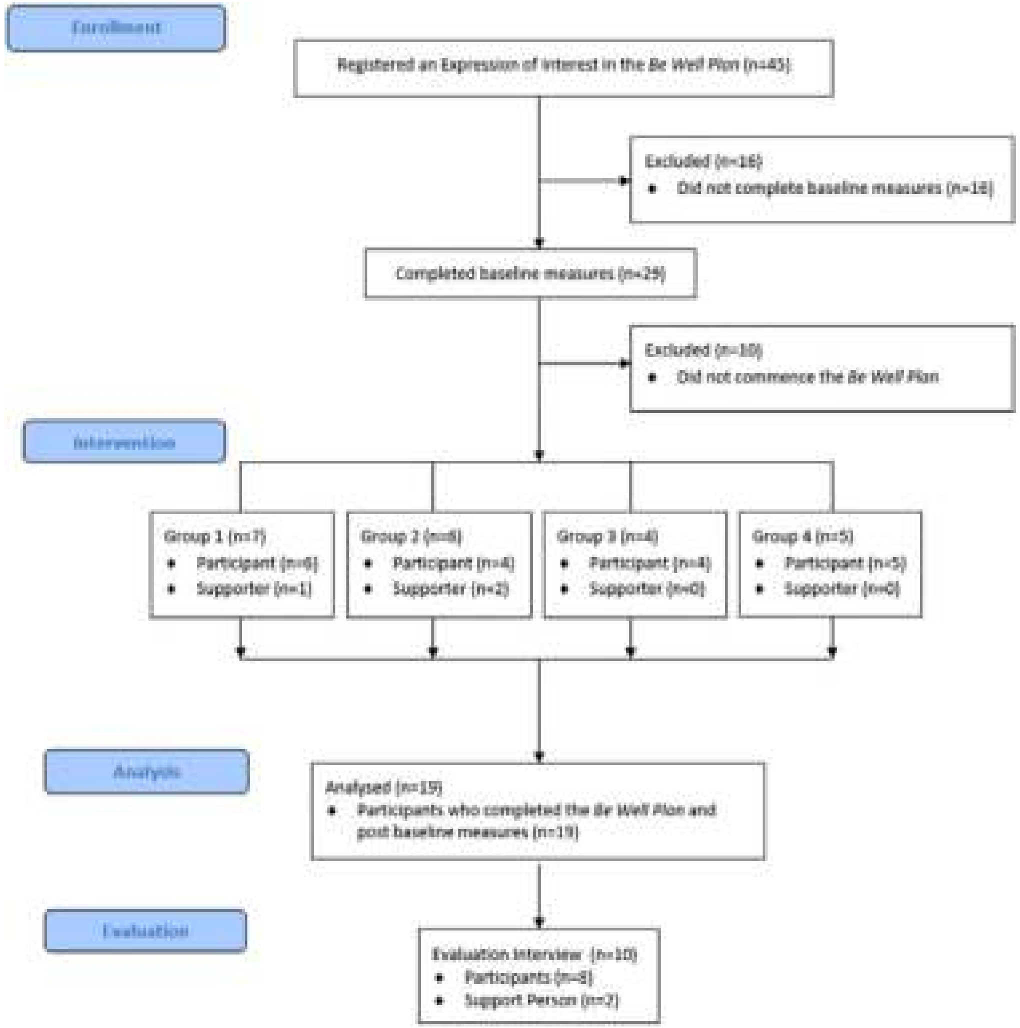

FIGURE 1 Participant flow diagram.

program?"(see Table S1 for the full list of interview questions), which is a systematic process to review and obtain the latent content of the text data. The text was processed into codes using a subjective interpretation of the content, followed by frequency counts.[37] Ten interviews (eight participants and two support persons) were undertaken by the researchers (Natalie Tuckey and Matthew Iasiello), lasting between 15 and 45 min. The first author transcribed the interviews verbatim, including any grammatical errors. Interview transcripts were then read several times for data familiarisation. NVivo was used to organize the data. Using an inductive approach, the first author then coded transcripts by segmenting text into verbatim short phrases and words, which were then assigned to a code. This process was repeated until all text was coded and data saturation was reached. In step two, the process of examining and interpreting the data was conducted to identify similarities between categories and to identify overlaps resulting in codes being sorted according to similarities and differences resulting in six categories and 48 subcategories to reflect the research aim of evaluating the *BWP*. The third step involved calculating the frequencies and percentage of codes within the sub-categories, to highlight divergent ideas among participants and further sort the data. Strategies to ensure credibility and trustworthiness included the maintenance of an audit trail, regular peer review, and cross-examination of 10% of codes against the raw data (by author Anna Chur-Hansen) for trustworthiness.

3 | RESULTS

3.1 | Participants

Figure 1 outlines the participant flow in the study. Of the 45 women with breast cancer who expressed an initial interest in the study, 29 (64%) completed baseline measures, and 19 (42%) participated in the *BWP*. An average of four out of five sessions of the *BWP* were attended by the participants. All participants who commenced the *BWP* completed the post-baseline measures. Participants were provided with a pre-recorded video to watch in their own time if they were

TABLE 1 Sociodemographic characteristics of participants of the Be Well Plan (*BWP*).

Characteristics	Participants ($n = 19$) % (n)
Age (mean, SD)	45.7 (7.74)
Employed in paid work	36.8% (7)
Diagnosed with Breast cancer	
Within the past 12 months	36.8% (7)
Between 12 and 24 months	21.1% (4)
Greater than 24 months	31.6% (6)
Stage I	10.5% (2)
Stage II	36.8% (7)
Stage III	31.6% (6)
Stage IV	10.5% (2)
Missing	10.5% (2)
Treatment*	
Chemotherapy	63.2% (12)
Radiotherapy	68.4% (13)
Surgery (Lumpectomy)	36.8% (7)
Surgery (Mastectomy)	57.9% (11)
Hormone therapy	63.2% (12)
Psychological support since treatment	42.1% (8)
Preference of delivery	
Online	21.1% (4)
Face-to-face	5.3% (1)
Either	57.9% (11)

*Multiple options were available for selection.

absent. Table 1 captures the sociodemographic characteristics of the participants of the *BWP*.

3.2 | Evaluating the impact of the BWP

3.2.1 | Pre-post-intervention changes

As shown in Table 2, multivariate ANOVA revealed significant large effect sizes in mental well-being ($F_{1,18} = 17.873, p = < 0.000$), depression ($F_{1,18} = 11.942, p = 0.001$), and anxiety ($F_{1,18} = 8.458, p = 0.006$). There were no statistically significant improvements reported for resilience ($F_{1,18} = 0.761$, $p = 0.389$), self-compassion ($F_{1,18} = 2.765$, $p = 0.105$), or QoL ($F_{1,18} = 1.16$, $p = 0.289$). Reliable change indices and minimal clinically important differences were also calculated for the psychological outcomes, showing that most participants had positive RCIs for the significant changes. The RCIs also showed that for outcomes that were non-significant, some participants had a reliable improvement. While it can be noted that a subset of participants ($n = 6$) showed a deterioration in some of the measured outcomes, only one participant did so in a clinical outcome, that is, anxiety.

3.2.2 | Evaluating the effectiveness of the BWP using qualitative content analysis

Qualitative feedback captured in the participant interviews was coded and arranged into six categories: Program Delivery Experience, Application of the BWP, Mental Health Improvements, Supporter Involvement, Adopted Interventions, and Recruitment, as described in Table 3 with illustrative quotes for each category (see Supplementary Information for qualitative themes and Table S2 for count and illustrative quotes for each of the subcategories).

Qualitative analysis showed participants had a positive experience in participating in the program, reporting a positive mindset shift, increased psychological insights, and psychoeducation about mental well-being. Participants demonstrated heightened psychological insight by reflecting on coping styles before and after the program and highlighted that prior to attending the program they focused on negative thoughts, catastrophizing and depressive symptoms. Learning techniques and practices such as mindfulness, breathing, and self-compassion were considered to be fundamental to improving the well-being of participants and their ability to manage psychological distress. Participants reported that they felt resilient, and had perspective and social connection with others, whilst also experiencing psychological distress when rediscovering their cancer diagnosis.

Technology was a challenge for some participants who reported being apprehensive about engaging in the breakout rooms and as a group. Overall, participants reported feeling psychologically safe in the group and felt physically safe to participate virtually. In terms of recruitment, participants reported being inundated with brochures when visiting practitioners during medical appointments and proposed that future studies utilize health professionals, such as breast cancer nurses, to recruit participants to the program. Participants also reported a desire to be followed up post-completion of the *BWP*, finding that other programs offering this personalized service are a strength.

Participants demonstrated a desire for engagement beyond the program for both social interaction with other participants and tracking of their well-being progress. Similarly, participants commented on the desire for more connectivity with other group members. Only three participants (15.8%) invited a support person to the program. Participants highlighted the desire to build their network outside of family and friends and avoid the perceived burden of the supporter's experience. Supporters themselves also had differing views, including feeling like an intruder and interfering with the discussions. They also felt hesitant to speak up and discuss their own goals, perceiving them to be irrelevant. Despite these experiences, both participants and supporters felt it strengthened the relationship and enabled lasting change to their well-being habits post the program.

4 | DISCUSSION

This mixed methods pilot study aimed to assess the feasibility of a group-based online mental well-being intervention for women living

TABLE 2 Pre-post intervention measures from participants of the Be Well Plan (*BWP*) ($n = 19$) with reliable change indices and minimal clinically important differences.

	Pre-intervention	Post-intervention	MANOVA			Reliable change indices		Minimal clinically important differences
	Mean [95% CI]	Mean [95% CI]	F	p	Partial ω^2	Positive (%)	Negative (%)	
Mental well-being	44.6 [40.2, 48.9]	53.4 [50.9, 55.9]	17.873	<.001	0.28	12 (63.2%)	0 (0%)	
Resilience	3.55 [3.39, 3.7]	3.54 [3.42, 3.6]	0.761	0.389		7 (36.8%)	4 (21.1%)	
Self-compassion	3.26 [2.89, 3.63]	3.6 [3.33, 3.87]	2.765	0.105		5 (26.8%)	1 (5.3%)	
Depression	18.3 [15.4, 21.1]	13.6 [12.1, 15]	11.942	0.001	0.21	10 (52.6%)	0 (0%)	12 (63.2%)
Anxiety	13.4 [11, 15.8]	9.74 [8.8, 10.7]	8.458	0.006	0.20	11 (57.9%)	1 (5.3%)	11 (57.9%)
Quality of life	8.47 [7.13, 9.82]	9.32 [8.07, 10.6]	1.16	0.289		7 (36.8%)	2 (10.5%)	
Change in at least one outcome						15 (78.9%)	6 (31.5%)	

TABLE 3 Category description with illustrative quotes.

Category	Description	Illustrative quote
Program delivery experience	Comments about the program as a whole as well as on the format and structure	"Made some great connections in a safe space where we could explore mental health and well-being." *(Participant#8)*
Mental health improvements	Cognitive and emotional changes and reflections observed by the participant	"I was in a real victim mode, I was dying, and I was, I don't know, everything hurt, and I just focused on the negatives and now I'm focusing on the positives." *(Participant#6)*
Application of the *BWP*	How participants are implementing the evidence-based activities	"I found that doing it again, that they became more an integral part of me, that I would just stop and do deep breathing during the day and I would incorporate that." *(Participant#7)*
Supporter involvement	Participants and supporter experiences of including supporters	"Perhaps that the program may have shifted focus at times to incorporate the person with you. Yeah for me it would have been an encumbrance." *(Participant#2)* "I think the course got us very tight with each other. And got us very supportive of each other as well. Not just me." *(Supporter#2)*
Adopted interventions	Activities participants used from the *BWP*	"We practice while we walked, we went to aqua aerobics and then we walk barefoot around the footy oval just to do the mindful walking." *(Participant#6)*
Future recruitment	Recommendations on how to recruit future participants.	"You spend a bit of time with the breast care nurses there, and I think it would be really good in those conversations if they mention have you heard about the *BWP*." *(Participant#3)*

with and beyond breast cancer. The *BWP* was well attended by those who commenced the program and reported high levels of engagement and satisfaction with the program. The study found large effect sizes in analyzing pre- and post-intervention outcome measures for mental well-being, depressive symptoms, and anxiety supported by qualitative experiences from participants. The qualitative content analysis adds context to how participants living with breast cancer applied the outcomes in the study and provided valuable insights into how to navigate breast cancer services and the biopsychosocial impacts of living beyond a breast cancer diagnosis. The results contributed to a growing body of research demonstrating the benefits of mental well-being interventions for people living with and recovering from cancer.[19]

4.1 | Evaluating the feasibility of the *BWP*

Attendance of the *BWP* was high among those who commenced the program, with an average of 4 out of 5 sessions of the *BWP* attended. The study demonstrated significant improvements in mental well-being, adding to the positive effects identified in prior evaluations of the *BWP* in non-clinical populations.[22] This study reported large effect sizes, which is promising, for example, it outperforms effect sizes that are reported in the literature on mental well-being interventions.[38] Participants expressed the benefit of the variety of well-being strategies to choose from and the use of habit formation to enable behavioral activation.[39] Individuals enjoyed experimenting with different positive mental health activities with friends, the facilitator, and other program participants.[40]

Large effect sizes were also reported in reducing depressive symptoms and anxiety, which is consistent with prior studies of the *BWP*,[22] and studies on mindfulness-based stress interventions[41] and again performing well compared to other well-being interventions such as positive psychological interventions.[42] High levels of depressive symptoms and anxiety at baseline, however, might have contributed to the results as it allows for more 'room to move'. It is inconclusive whether participant demographics, such as stage of breast cancer, impacted the results due to the variation in participants.

In comparison with the *BWP* outcomes previously reported in the RCT by Fassnacht et al.,[22] no statistical change was found for resilience post-intervention at the group level. However, RCI analysis indicated that this result may be explained by the fact that while some participants did see positive reliable change ($n = 4$), others reported negative change ($n = 4$).

No meaningful improvements were found for quality of life. This result, contrary to the results found above for resilience where we expected an a priori improvement, was in line with expectation. The items of the EORTC QLQ-C30 cover a variety of physical symptoms and capabilities, which is not the primary outcome that the 5-week *BWP* intends to target. Nevertheless, the qualitative analysis found participants did report an increase in behavioral activation as a result of the program by introducing regular physical exercises such as walking and yoga. As research has shown that positive mental health and well-being do improve physical illness in the longer term,[8] further research on the long-term physical health outcomes of the *BWP* is recommended.

A novel finding in this study was the differing perspectives on involving support people in the *BWP*. Participants who brought a supporter reported being highly engaged with the activities through the program and beyond the 5 weeks to embed the changes in their routines aided their participation and reinforced well-being activities during the program and post-intervention, which is reinforced by prior studies.[43] The ability to reinforce the content through weekly discussions between the participant and supporter was also highlighted, despite a low uptake of taking supporters to the program.

The *BWP* offered above-average effect sizes in several measures (noting the fact that this was a small sample size, thus introducing variability in responses), positive sentiments from participant feedback, and high attendance once participants commenced the program however, it is imperative to consider how it could be paired with existing online support services so that they work in harmony and not in competition. For example, the *Finding My Way program* offers a self-directed psychosocial program for women with metastatic breast cancer and has shown benefits in emotional functioning and long-term increases in health service usage,[44] and given its role is to help people navigate a breast cancer diagnosis, it is likely that these would work synergistically to provide support across the cancer continuum. The critical aspect in ensuring synergy is the timing and delivery of these interventions, ensuring they are directed to the patient at distinct points in their diagnosis, treatment, and survivorship to achieve optimal outcomes without introducing complexity or competition.

4.2 | Study strengths and limitations

This study had a number of strengths. First, the study drew on an existing universal evidence-based program that has been tested previously under RCT conditions,[22] which provided a solid foundation to deliver and administer this study. Although a bit of contextualisation was done for the program (e.g., using appropriate examples and developing a pathway for supporters to attend) the main content and concepts were similar to the general version. This shows the utility of making minor alterations to existing evidence-based programs for use in specialist settings such as cancer, rather than requiring to redesign interventions completely from scratch, which has obvious resourcing implications for services looking at implementing well-being solutions for cancer patients. This is compounded by the fact that the *BWP* can be delivered by accredited facilitators who are not required to be clinically trained, allowing for a scalable mental health solution to supplement the shortage of mental health professionals.[45] Furthermore, this study consisted of four groups held across the calendar year, thus addressing potential cyclical mental well-being effects (such as holiday periods and weather changes). Another strength of this study was the mixed-method design employed; quantitative and qualitative data provide a level of depth that may be absent using a single method.[46]

Limitations of this study include the lack of a control group and the short-term follow-up. A within-group design with only pre- and post questionnaires means results may have been influenced by the active treatment-induced fluctuations in physical, and mental side effects.[47] Feedback from individuals who completed the online baseline measure but did not enroll in the program ($n = 10$) would have proved insightful for future studies and, possibly, their reasons for not enrolling may have been accommodated in the present study if follow-up conversations had been made. Similarly, many participants who expressed initial interest were lost due to their preference for nighttime sessions which could not be accommodated in the current study. There may also have been a self-selection bias; indeed participants highlighted prior interest and knowledge in mental well-being during the follow-up interviews, which may have attracted participants with an ardor for mental well-being, thus the *BWP* reinforced mental well-being practices and those already focused on self-management. While there may also be a non-response or dropout bias, the effect on the study results is likely minimal considering the high completion rate. It is recommended that additional studies in clinical populations are conducted to test the *BWP* to eliminate any research biases, with the researchers blind to participants and data collection, as well as offering a waitlist and control group.

4.3 | Future directions of the BWP

A number of recommendations are provided to enable the *BWP* to be explored beyond a research setting. First, consistent with prior studies, recruitment and uptake of participation was a challenge,[48] with only 42%, of those who expressed an interest, enrolled in the study. This is not specific to this population and is a common challenge when recruiting other clinical populations for prevention and early intervention programs.[49] Given that the *BWP* was delivered online during a specific day/time of the week, this may have been a barrier to those with differing personal commitments. It is recommended that the program be offered at different days/times to provide choices to the participants, as well as an introductory session to explain the program, introduce participants to each other, and attend to any technological barriers. From this present study, additional research is needed to further evaluate the effectiveness of the *BWP*. Large-scale randomized controlled studies are needed to examine the impact of the *BWP* in supporting survivors of cancer to build mental well-being and alleviate psychological distress in the short and long term.

4.4 | Implications for clinicians

The *BWP*, building on current and prior research, is an evidence-based intervention that could be considered a complementary tool to support individuals with their breast cancer diagnosis, in a scalable way reaching those in need. The program can be delivered online to include rural and hard-to-reach survivors or those concerned about the physical challenges of a face-to-face environment. The *BWP* can also be delivered as an in-person option allowing access to those apprehensive of using technology. Additional sessions pre- or post-intervention could be offered to accommodate participants' desire for ongoing interaction and more social connectivity. In addition, a session with clinicians could be offered to further tailor the program to this specific target group. Independent of the format, considerations should be given whether or not to include support people in the intervention, and how to integrate the program into complementary services.

5 | CONCLUSION

In conclusion, this pilot study has found that the online mental well-being program, the *BWP*, holds promise as an effective and accessible way to improve the mental well-being in women living with breast cancer, with preliminary results showing improvements in mental well-being, self-compassion, and symptoms of depression and anxiety. The *BWP* was well received by participants, with qualitative feedback highlighting the diversity and individual tailoring of well-being activities as well as the weekly accountability. This study demonstrated the desire of participants to enhance social interactions following intervention. Involving a support person had benefits to embedding change and reinforcing learnings of the *BWP*, however, this was experienced differently by participants. Future research should build upon this study and explore the impact of the program on different vulnerable populations.

AUTHOR CONTRIBUTIONS

All authors contributed to the study's conception and design. The first draft of the manuscript was written by Natalie Tuckey and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

ACKNOWLEDGEMENTS

This work was supported by private philanthropic donations and has received research support from SAHMRI. HR Wardill is supported by a fellowship made available through the Hospital Research Foundation Group.

CONFLICT OF INTEREST STATEMENT

There are no direct financial interests in this study. Several authors are employed by SAHMRI, in which the *BWP* is a revenue source.

ETHICS STATEMENT

Ethics approval was granted in accordance with Australian NHMRC guidelines (Flinders University HREC Sub-committee #4866, and noted by the University of Adelaide HREC sub-committee #36368).

PATIENT CONSENT STATEMENT

Participants were informed about the nature and content of the study prior to providing their consent to participate.

REFERENCES

1. WHO. Breast cancer 2021. 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/breast-cancer
2. Moore HCF. Breast cancer survivorship. *Semin Oncol*. 2020;47(4):222-228.
3. Rajagopal L, Liamputtong P, McBride KA. The lived experience of Australian Women living with breast cancer: a meta-synthesis. *Asian Pac J Cancer Prev*. 2019;20(11):3233-3249.
4. Australian Institute of Health and Welfare. Cancer in Australia 2021. Available from: https://www.aihw.gov.au/reports/cancer/cancer-in-australia-2021
5. Marzorati C, Riva S, Pravettoni G. Who is a cancer survivor? a systematic review of published definitions. *J Cancer Educ*. 2017;32(2):228-237.
6. Oh PJ, Cho JR. Changes in fatigue, psychological distress, and quality of life after chemotherapy in women with breast cancer: a prospective study. *Cancer Nurs*. 2020;43(1):E54-e60.
7. Hashemi SM, Rafiemanesh H, Aghamohammadi T, et al. Prevalence of anxiety among breast cancer patients: a systematic review and meta-analysis. *Breast Cancer*. 2020;27(2):166-178.
8. Lamers SM, Bolier L, Westerhof GJ, Smit F, Bohlmeijer ET. The impact of emotional well-being on long-term recovery and survival in physical illness: a meta-analysis. *J Behav Med*. 2012;35(5):538-547.
9. Vardy JL, Chan RJ, Koczwara B, et al. Clinical Oncology Society of Australia position statement on cancer survivorship care. *Aust J Gen Pract*. 2019;48(12):833-836.
10. Keesing S, Rosenwax L, McNamara B. A call to action: the need for improved service coordination during early survivorship for women with breast cancer and partners. *Women Health*. 2019;59(4):406-419.
11. Chan RJ, Crawford-Williams F, Crichton M, et al. Effectiveness and implementation of models of cancer survivorship care: an overview of systematic reviews. *J Cancer Surviv*. 2023;17(1):197-221.
12. Shapiro CL. Cancer survivorship. *N Engl J Med*. 2018;379(25):2438-2450.
13. van der Kruk SR, Butow P, Mesters I, et al. Psychosocial well-being and supportive care needs of cancer patients and survivors living in rural or regional areas: a systematic review from 2010 to 2021. *Support Care Cancer*. 2022;30(2):1021-1064.
14. Oh P-J, Cho J-R. Changes in fatigue, psychological distress, and quality of life after chemotherapy in women with breast cancer: a prospective study. *Cancer Nursing*. 2020;43(1):E54-E60.

15. Ryff CD, Boylan JM, Kirsch JA. Eudaimonic and hedonic well-being. In: Lee MT, Kubzansky LD, VanderWeele TJ, eds. *Measuring Well-Being*. Oxford University Press; 2021:92-135.
16. Aizpurua-Perez I, Perez-Tejada J. Resilience in women with breast cancer: a systematic review. *Eur J Oncol Nurs*. 2020;49:101854.
17. van Agteren J, Ali K, Fassnacht DB, et al. Testing the differential impact of an internet-based mental health intervention on outcomes of well-being and psychological distress during COVID-19: uncontrolled intervention study. *JMIR Ment Health*. 2021;8(9):e28044.
18. Kemp E, Koczwara B, Butow P, et al. Online information and support needs of women with advanced breast cancer: a qualitative analysis. *Support Care Cancer*. 2018;26(10):3489-3496.
19. Leslie M, Beatty L, Hulbert-Williams L, et al. Web-based psychological interventions for people living with and beyond cancer: meta-review of what works and what does not for maximizing recruitment, engagement, and efficacy. *JMIR Cancer*. 2022;8(3):e36255.
20. Beatty L, Kemp E, Butow P, et al. Finding my way-advanced: can a web-based psychosocial intervention improve the mental quality of life for women with metastatic breast cancer vs attention-control? Study protocol of a randomised controlled trial. *BMC Cancer*. 2022;22(1):1353.
21. van Agteren J, Bartholomaeus J, Steains E, Lo L, Gerace A. Using a technology-based meaning and purpose intervention to improve well-being: a randomised controlled study. *J Happiness Stud*. 2021;22(8):3571-3591.
22. Fassnacht DB, Ali K, van Agteren J, et al. A group-facilitated, internet-based intervention to promote mental health and well-being in a vulnerable population of university students: randomized controlled trial of the be well plan program. *JMIR Ment Health*. 2022;9(5):e37292.
23. van Agteren J, Iasiello M, Ali K, et al. Using the intervention mapping approach to develop a mental health intervention: a case study on improving the reporting standards for developing psychological interventions. *Front Psychol*. 2021;12:648678.
24. van Agteren J, Iasiello M, Lo L, et al. A systematic review and meta-analysis of psychological interventions to improve mental well-being. *Nat Hum Behav*. 2021;5(5):631-652.
25. Lamers SM, Westerhof GJ, Bohlmeijer ET, ten Klooster PM, Keyes CL. Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF). *J Clin Psychol*. 2011;67(1):99-110.
26. Clarke A, Friede T, Putz R, et al. Warwick-Edinburgh Mental Well-being Scale (WEMWBS): validated for teenage school students in England and Scotland. A mixed methods assessment. *BMC Public Health*. 2011;11:487.
27. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med*. 2008;15(3):194-200.
28. Raes F, Pommier E, Neff KD, Van Gucht D. Construction and factorial validation of a short form of the Self-Compassion Scale. *Clin Psychol Psychother*. 2011;18(3):250-255.
29. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16(9):606-613.
30. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10):1092-1097.
31. Fayers P, Bottomley A. Quality of life research within the EORTC-the EORTC QLQ-C30. European Organisation for Research and Treatment of Cancer. *Eur J Cancer*. 2002;38(4):S125-S133.
32. O'Brien RG, Kaiser MK. MANOVA method for analyzing repeated measures designs: an extensive primer. *Psychol Bull*. 1985;97(2):316-333.
33. Albers C, Lakens D. When power analyses based on pilot data are biased: inaccurate effect size estimators and follow-up bias. *J Exp Soc Psychol*. 2018;74:187-195.
34. Field A. *Discovering Statistics using IBM SPSS Statistics*. Sage; 2013.
35. Jacobson NS, Truax P. Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *J Consult Clin Psychol*. 1991;59(1):12-19.
36. Kounali D, Button KS, Lewis G, et al. How much change is enough? Evidence from a longitudinal study on depression in UK primary care. *Psychol Med*. 2022;52(10):1875-1882.
37. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005;15(9):1277-1288.
38. Weiss LA, Westerhof GJ, Bohlmeijer ET. Can we increase psychological well-being? The effects of interventions on psychological well-being: a meta-analysis of randomized controlled trials. *PLoS One*. 2016;11(6):e0158092.
39. Stecher C, Berardi V, Fowers R, Christ J, Chung Y, Huberty J. Identifying app-based meditation habits and the associated mental health benefits: longitudinal observational study. *J Med Internet Res*. 2021;23(11):e27282.
40. Cipolletta S, Simonato C, Faccio E. The effectiveness of psychoeducational support groups for women with breast cancer and their caregivers: a mixed methods study. *Front Psychol*. 2019;10:288.
41. Zainal NZ, Booth S, Huppert FA. The efficacy of mindfulness-based stress reduction on mental health of breast cancer patients: a meta-analysis. *Psychooncology*. 2013;22(7):1457-1465.
42. Pan S, Ali K, Kahathuduwa C, Baronia R, Ibrahim Y. Meta-analysis of positive psychology interventions on the treatment of depression. *Cureus*. 2022;14(2):e21933.
43. Wang C, Chen J, Wang Y, et al. Effects of family participatory dignity therapy on the psychological well-being and family function of patients with haematologic malignancies and their family caregivers: a randomised controlled trial. *Int J Nurs Stud*. 2021;118:103922.
44. Beatty L, Kemp E, Coll JR, et al. Finding my way: results of a multicentre RCT evaluating a web-based self-guided psychosocial intervention for newly diagnosed cancer survivors. *Support Care Cancer*. 2019;27(7):2533-2544.
45. Stuhlmiller C. Rethinking mental health nursing education in Australia: a case for direct entry. *Int J Ment Health Nurs*. 2005;14(3):156-160.
46. Curry LA, Nembhard IM, Bradley EH. Qualitative and mixed methods provide unique contributions to outcomes research. *Circulation*. 2009;119(10):1442-1452.
47. Simó M, Rifà-Ros X, Rodriguez-Fornells A, Bruna J. Chemobrain: a systematic review of structural and functional neuroimaging studies. *Neurosci Biobehav Rev*. 2013;37(8):1311-1321.
48. Driscoll D. Introduction to primary research: observations, surveys, and interviews. In: Lowe C, Zemliansky P, eds. *Writing Spaces: Readings on Writing*. Writing Spaces; 2011.
49. Ali K, Fassnacht DB, Farrer LM, et al. Recruitment, adherence and attrition challenges in internet-based indicated prevention programs for eating disorders: lessons learned from a randomised controlled trial of ProYouth OZ. *J Eat Disord*. 2022;10(1):1.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Tuckey N, Agteren J, Chur-Hansen A, et al. Implementing a group-based online mental well-being program for women living with and beyond breast cancer – A mixed methods study. *Asia-Pac J Clin Oncol*. 2024;1-10. https://doi.org/10.1111/ajco.14060