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A qualitative assessment of patient perspectives on a cardiac rehabilitation program tailored to breast cancer survivors: the heart health after cancer treatment (HEART-ACT) study

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Abstract

Purpose

To understand the experiences of breast cancer survivors participating in the Heart Health After Cancer Treatment (HEART-ACT) study, a tailored 12-week cardiac rehabilitation (CR) program, and to identify perceived benefits and barriers to participation.

Methods

We conducted semi-structured interviews with a purposive sample of participants who completed the HEART-ACT program at an urban safety-net hospital. Interviews explored participants' experiences, program preferences, barriers and facilitators to participation, and experiences with program technology. Transcripts were analyzed using rapid template analysis, with themes organized according to the Theory of Planned Behavior.

Results

Of 50 HEART-ACT participants, 21 (42%) completed exit interviews. Participants described perceived physical, emotional, and psychosocial benefits, including improved exercise ability, confidence, health knowledge, and reduced anxiety. Camaraderie among participants and supportive relationships with program staff were prominent sources of motivation and engagement. Frequent check-ins and practical, home-based instruction facilitated participation. Work and caregiving responsibilities remained important barriers, while transportation assistance helped mitigate logistical challenges. Participants had mixed experiences with wearable and mobile technologies.

Conclusion

A tailored CR program was perceived as beneficial and engaging among breast cancer survivors in a safety-net setting. Social support and individualized assistance were important contributors to engagement, while flexible approaches are needed to address technological barriers.

Introduction

Breast cancer survivors face significantly higher rates of cardiovascular disease (CVD) than patients without a history of breast cancer. [1] Shared risk factors for CVD and breast cancer, as well as the cardiotoxic effects of therapies used to treat breast cancer, may explain this disproportionate burden of CVD among breast cancer survivors. [2] Among survivors older than 65 years, CVD has surpassed breast cancer as the leading cause of mortality. [3] In addition, many breast cancer survivors experience reduced functional capacity and diminished health-related quality of life after their treatment, often

feeling inadequately informed about managing long-term comorbidities. [4, 5] As breast cancer survivorship improves, targeted CVD risk reduction is increasingly important.

Cardiac rehabilitation (CR), a structured, multidisciplinary program with supervised exercise, education, and psychosocial support, improves outcomes for people with CVD.[6] The robust evidence behind the benefits of CR for populations with heart disease has resulted in increased interest in CR as a template for oncology populations. [7] Studies adapting CR for breast cancer survivors have demonstrated feasibility, as well as improvements in physical activity, fatigue, and quality of life among participants.[8, 9] However, questions remain about how breast cancer survivors experience CR in real-world settings, what facilitates or hinders participation, and how programs can be tailored to be culturally responsive, practical, and integrated into routine care.

The objective of this analysis was to understand the experiences of participants in the Heart Health After Cancer Treatment (HEART-ACT) study, which piloted a twelve-week, tailored CR program for breast cancer survivors. [10] This qualitative assessment of exit interviews aims to identify perceived benefits, barriers, and implementation needs to inform future CR programs and improve the cardiovascular health of breast cancer survivors.

Methods

Design

This study is a qualitative analysis of participant interviews completed as part of the HEART-ACT study, a pilot study that tested a tailored CR program for breast cancer survivors. The program was delivered at the Zuckerberg San Francisco General Hospital, an urban safety net hospital in San Francisco, California. The pilot was delivered between November 2023 and June 2025. All participants completed a baseline study visit at enrollment. At this visit, baseline measurements including height, weight, blood pressure, and 6-Minute Walk Test were obtained. Participants also completed questionnaires assessing domains such as demographic information, medical history, cognitive function, health and digital literacy, physical activity, and diet. The 12-week program was offered at no cost to participants; it consisted of alternating weekly in-person group and individual sessions. Sessions were delivered in Cantonese, Spanish, and English according to participants' preferred language. Led by a professional health educator, group sessions included structured didactics, as well as time for peer discussion. Sessions focused on topics related to cancer survivorship, heart health, physical activity, nutrition, and emotional wellbeing. During individual sessions, participants met with program staff to review individualized exercise prescriptions and discuss participants' progress. All educational materials were designed for low-literacy levels and provided in participants' preferred language. Participants received a Fitbit, exercise peddler, dumbbells, and resistance bands as part of the program; they received assistance in setting up the Fitbit and instructions on how to use the technology. Participants were offered the use of a mobile application for cardiac rehabilitation (Chanl Health). In response to mid-program feedback about transportation barriers,

transportation to in-person sessions and study visits was provided by the study for participants in need of transportation assistance.

The pilot aimed to assess the feasibility and acceptability of the program and health outcomes at 3-, 6-, and 12-month intervals after program completion. For compensation, participants received $100 gift cards after completing the baseline intake visit, $100 after completing the 3-month follow-up visit, $50 for completing the 6- month follow-up visit, and $50 for completing the 12-month follow-up visits. Participants were asked to complete exit interviews after completion of the 12-week program; they did not receive compensation for these interviews.

Participants

Participants were eligible if they were over 18 years of age, had a diagnosis of breast cancer and had been treated with curative intent, could communicate in English, Spanish, or Cantonese, and could consent themselves. Patients were not eligible for participation if chemotherapy, radiation, or surgery for their cancer was planned within three months of recruitment or if their life expectancy was less than one year. Participants were recruited from the breast oncology clinic at ZSFG. The pilot program enrolled 50 participants in total. A purposive sample of participants was asked to participate in the exit interview to ensure representation of experiences from all language groups.

Interviews

Semi-structured interviews were conducted over Zoom, phone, or in-person, in the participant's preferred language using an interview guide (Supplemental Material 1) by trained bilingual research staff. Interviews were completed within 2 weeks of completion of the 12-week CR program. The interview guide elicited participant perspectives on the most and least valuable part of the program, barriers and facilitators to participation, suggested changes to the program, and experiences with technology. Interviews lasted approximately 30 minutes and were audio-recorded.

Analysis

Participant demographics collected in baseline questionnaires were summarized using descriptive statistics. Interview transcripts were generated from recorded interviews and translated to English, then reviewed by bilingual research staff for content and meaning with revisions made for accurate transcription. We performed rapid template analysis[11] based on the aims of the program evaluation; the template focused on favorite and least favorite program components and facilitators and barriers to participation. Two reviewers independently analyzed each interview transcript and coded responses based on the template, then met to ensure concordance in coding; discrepancies were reviewed by a third reviewer. Themes were identified inductively, refined, and collated and representative quotes were selected. Themes were organized according to constructs (attitudes and beliefs, subjective norms, and

perceived behavioral control) from the Theory of Planned Behavior, which has been used by prior studies to explain participation in CR. [12–14]

Results

Among 50 study participants, 21 (42%) completed exit interviews (Table 1). Given the modest sample size, comparisons were interpreted descriptively rather than through formal hypothesis testing. Participants who completed exit interviews were broadly similar to the overall study cohort. Mean age was 58.8 years (SD 11.1) in the full cohort and 58.7 (SD 12.4) among interview participants. Preferred language distribution was also similar; among interview participants, 7 (33%) preferred Cantonese, 10 (48%) preferred English, and 4 (19%) preferred Spanish, compared with 30%, 48%, and 22%, respectively, in the full cohort. Educational attainment, food insecurity, and health literacy were likewise comparable. College completion was reported by 48% of all participants and 43% of interview participants, food insecurity by 50% and 43%, and high confidence in health literacy by 60% and 67%, respectively.

Table 1
Baseline characteristics of HEART-ACT Cancer participants and exit interview participants

N	Total	Exit Interviews
	50	21
Preferred Language (%)		
Cantonese	15 (30%)	7 (33%)
English	24 (48%)	10 (48%)
Spanish	11 (22%)	4 (19%)
Age [years, mean (SD)]	58.81 (11.08)	58.65 (12.42)
Sex		
Female	49 (98%)	20 (100%)
Unknown	1 (2%)	0 (0%)
Race and ethnicity (%)		
Asian	20 (40%)	8 (38%)
Black or African American	7 (14%)	4 (19%)
Latino or Hispanic	13 (26%)	5 (24%)
Mixed or Other race	1 (2%)	0 (0%)
White	4 (8%)	3 (14%)
Don't know or Unknown	5 (10%)	1 (5%)
Highest level of education (%)		
College or above	24 (48%)	9 (43%)
High school or below	26 (52%)	12 (57%)
Food insecurity (%)		
No	23 (46%)	11 (52%)
Yes	25 (50%)	9 (43%)
Don't know or Unknown	2 (4%)	1 (5%)
Health literacy (%)		
High confidence	30 (60%)	14 (67%)
Low confidence	19 (38%)	7 (33%)
Unknown	1 (2%)	0 (0%)

N	Total	Exit Interviews
	50	21
Cancer Biology (%)		
Estrogen Receptor Positive	43 (89%)	19 (91%)
Progesterone Receptor Positive	36 (74%)	16 (76%)
HER2 Positive	11 (26%)	5 (26%)
Medical History (%)		
Diabetes	8 (16%)	3 (14%)
Hypertension	19 (39%)	6 (29%)
Medications (%)		
High cholesterol medication	18 (37%)	10 (48%)
Antihypertensive medication	16 (33%)	6 (29%)
Substance Use		
Alcohol use (number of drinks per week, mean (SD))	0.66 (1.57)	0.83 (1.91)
Tobacco use (%)	9 (18%)	3 (14%)

Qualitative Results

Themes and representative quotes are summarized in Table 2.

Table 2
Main themes of HEART-ACT Cancer exit interviews organized by Theory of Planned Behavior constructs

Theoretical Construct[12]	Theme		Example Quotations
Attitudes and beliefs Degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question	Physical benefits		*"My blood pressure used to fluctuate a lot, but after joining the program, it has really helped stabilize it."*
	Emotional benefits		*"I am not so worried about my illness because I know more."*
	Fun and joy		*"We have fun there, we talk about anything, we laugh."*
Subjective Norms Perceived social pressure to perform or not to perform the behavior	Camaraderie among participants		*"From the start, the group gave us participation, a sense of togetherness."*
	Supportive staff		*"[Program staff member] is very detailed and thorough when she called us. Not only would she ask about our health, she would ask about what is going on in our lives. She cared about our moods."*
Perceived Behavioral Control Perceived ease or difficulty of performing the behavior	Facilitators	Frequent Check ins and Accountability	*"Yes, frequent phone calls. I really like receiving your calls. 'How are you today, have you done the exercises?' [Program staff member] and the team keep checking on us, reminding us to measure blood pressure and so on."*
		Practicality of Instruction	*"Yes, the one that taught us how to cook healthy food following simple recipes. I learned how to prepare easy but nutritious meals."* *"The practical sessions doing exercises, like those when we learned how to take deep-breathing and other moves."*
	Barriers	Scheduling and logistical barriers	*"My job. Sometimes I couldn't come because of my job. I really want to come, but I just don't have the time."*
	Mixed experiences with technology		*"I felt motivated to walk more the next day if I did not meet my step goal the day before."* *"The App is in Chinese, but there are parts here that I still do not know how to use."*

Attitudes and beliefs

Physical benefits

Most participants expressed appreciation for the program's impact on physical health and wellbeing. Some participants endorsed improvements in measurable physical health outcomes, such as weight and blood pressure. Others reported improvements in subjective markers of health, including reduced pain, enhanced exercise ability and tolerance, and improvements in sleep quality. Many shared the sentiment that the healthy diet patterns emphasized in the program could help promote a healthy lifestyle long-term.

"I was just moving around randomly, not following any patterns or standards, which gave no real benefit to my health. Upon joining the Program, I can actually feel the change. At least, I now know how to stretch properly… and I can feel that my weight has now been stabilized." – Participant 36

"My blood pressure used to fluctuate a lot, but after joining the program, it has really helped stabilize it." – Participant 6

"After three months, I feel perfect… Yes, sometimes my knee hurts a little, but not as much as it used to. I feel better." – Participant 31

"… a nutritionist focused on food and nutrition. That has changed my life because I've learned what kinds of food we can eat and feed our families." – Participant 28

Emotional benefits

Many participants reported experiencing a variety of emotional and psychological benefits of the program. Some described not only increased motivation to exercise and eat a balanced diet, but also improved confidence and self-efficacy surrounding maintaining a healthy lifestyle. Furthermore, many participants felt that the program helped to reduce their anxiety levels, both about their cancer history and their overall health. The support and community of staff and fellow participants, as well as the stress reduction techniques included in the program helped facilitate these reductions in anxiety.

"This program is really good because it motivates you to keep exercising and to maintain a healthy diet."—Participant 34

"The class today, for instance, taught us how to relax and direct our thoughts. When in pain, you should not focus on the pain. Try to distract yourself, and think of something else."—Participant 36

"They give you a lot of self-sufficiency. They teach you how to figure things out." –Participant 39

"I am not so worried about my illness because I know more."—Participant 11

"Confidence levels went up to 10." – Participant 23

Fun and joy

Many participants highlighted that the program facilitated a joyful experience for them. They found the sessions fun and derived enjoyment from their participation. The dancing and movement included in the sessions were particularly enjoyable.

"One day, in particular, was set aside for dancing, and I really had a lot of fun." – Participant 11

"We have fun there, we talk about anything, we laugh." –Participant 7

"You just follow a little bit and kind of have fun." – Participant 4

"I feel happy to come there. I feel happy to have every one of you people in my life." – Participant 9

Subjective Norms

Camaraderie among participants

Most interviewees highlighted the relationships and camaraderie among program participants as one of the most valuable parts of their experience. They felt the program created a supportive, open environment that facilitated exchange of ideas. Many endorsed learning about healthy habits from one another. The bonds created among participants served as motivation to maintain lifestyle changes. The sense of community also made participants feel supported in navigating cancer survivorship.

- *"At first, I thought, 'I don't have anything in common with these gals,' but I really felt emotionally connected to all of them by the end." – Participant 5*

"Even outside of class, the conversations we have as friends matter a lot. We learn from each other how to take better care of ourselves and keep fit in different situations." – Participant 6

"From the start, the group gave us participation, a sense of togetherness."—Participant 28

"For me, this program has been very helpful because as women who are cancer survivors, we need a lot of support." – Participant 28

Supportive staff

Interactions and relationships with program staff were some of the main motivating factors that participants endorsed. Participants valued the individual connections they formed with staff, who made participants feel cared for and supported. These connections with staff both facilitated learning and provided motivation for ongoing participation.

"I really liked the way the people who gave us this program spoke, how they motivated us to eat and live healthier." – Participant 38

"[Staff member] is very detailed and thorough when she called us. Not only would she ask about our health, she would ask about what is going on in our lives. She cared about our moods." – Participant 6

“[The individual sessions] were like checking in with a friend.” – Participant 21

“The chance to learn from a nurse and nutritionist who were teaching us many things. For me, that’s been vitally important.” – Participant 28

“[Program staff member] is very caring. She is fair to everyone.” – Participant 22

Perceived Behavioral Control

Facilitators

The main facilitators of participation in the program that interviewees identified included the frequent check ins and the practical nature of the instruction.

Frequent Check-ins and Accountability

Many participants reported the individual check-ins with staff helped promote accountability in completing home exercises, as well as engagement with the program overall.

“I like when they call me and ask me about [the home exercises]… I told [program staff member] it made me feel strong.” – Participant 9

“Yes, frequent phone calls. I really like receiving your calls. ‘How are you today, have you done the exercises?’ [Program staff member] and the team keep checking on us, reminding us to measure blood pressure and so on.” -- Participant 17

Practicality of Instruction

Participants valued the extent to which the program’s instruction on nutrition and exercise could be incorporated into their daily lives. Many reported that the simplicity of the recipes made them feel empowered to prepare nutritious meals at home. They felt the exercise instruction required minimal equipment and could be modified to perform at home. The handouts from class served as a memory tool and allowed participants to recreate recipes and exercises at home.

“Yes, the one that taught us how to cook healthy food following simple recipes. I learned how to prepare easy but nutritious meals.” – Participant 6

“The practical sessions doing exercises, like those when we learned how to take deep-breathing and other moves.” – Participant 17

“I like that the equipment is small, not so big or heavy. The little gadgets allow me to do exercises at home.” – Participant 22

“How I’m supposed to do the exercises, what position I need to hold properly… I do it a at home because I have the weights, just like the instructor showed when she came.” – Participant 31

“Although I’m old and can’t remember every class, when I go home and read the handouts, I feel like I’m still capable of learning.” – Participant 36

Barriers

Scheduling and logistical barriers

The main barriers that participants identified were related to work and family responsibilities that conflicted with attending sessions. Notably, transportation to the sessions initially posed a barrier to attendance; the pilot program making transportation available to participants helped alleviate this barrier.

“My job. Sometimes I couldn’t come because of my job. I really want to come, but I just don’t have the time.”—Participant 12

“More than anything, it was difficult for me because my husband has Alzheimer’s, and sometimes it’s hard for me to leave him since I have to keep an eye on him. But coming here wasn’t difficult. They’d call me an Uber to pick me up.”—Participant 34

Mixed experiences with technology

Participants had mixed experiences with the program’s patient-facing technology. They found the Fitbit device and app to be helpful tools, but sometimes found them challenging to use. On the one hand, some participants felt that the Fitbit was easy to use once program staff assisted with setting up the device. They felt it provided motivation to exercise by providing a step goal and tracking participants’ progress toward the goal. On the other hand, some participants found using a mobile app for CR overwhelming, and some endorsed difficulty understanding how to use the Fitbit despite the instruction provided.

“[The Fitbit] was easy to use after you helped me connect it to my phone.” – Participant 36

“I felt motivated to walk more the next day if I did not meet my step goal the day before.” – Participant 36

“Once I got to know [the Fitbit] a little better, I found it to be a stronger tool for me.” – Participant 21

“The App is in Chinese, but there are parts here that I still do not know how to use.” – Participant 25

Discussion

This qualitative evaluation of the HEART-ACT CR program demonstrated successful implementation of a survivorship-centered program tailored to breast cancer survivors in a multi-lingual, safety-net population. Interviews highlighted favorable attitudes toward the program, including perceived physical, emotional, and psychosocial benefits. Participants emphasized the importance of social support from both fellow participants and program staff. Interviews also identified facilitators and barriers that

influenced participation and engagement in healthy lifestyle behaviors. We organized findings according to the Theory of Planned Behavior to provide insight into factors that may shape breast cancer survivors' willingness and ability to engage in cardiovascular risk reduction and survivorship care.

By intentionally addressing structural barriers to CR participation, the HEART-ACT program was able to engage a multi-lingual population within a safety-net health system. Prior studies have consistently identified cost, language discordance, transportation challenges, competing work and caregiving responsibilities, and limited health literacy as major barriers to participation in CR. [15, 16] In the present study, participants across English-, Spanish-, and Cantonese-speaking groups described meaningful engagement with the program, suggesting that language-concordant delivery facilitated understanding, trust, and participation. Transportation assistance helped mitigate an important logistical barrier, allowing several participants to attend despite caregiving responsibilities and competing life demands. Furthermore, participants with limited financial resources and varying levels of literacy were able to participate, as the program was offered at no cost and included materials tailored for low literacy levels.

Still, despite these adaptations that facilitated participation for some participants, others cited work obligations and caregiving responsibilities as persistent logistical barriers. The challenge of overcoming these competing demands despite strong interest in the program has been highlighted in prior CR literature. [17, 18] These findings support ongoing efforts to develop flexible models of rehabilitation delivery, including hybrid, telehealth, and home-based approaches. Such models may improve accessibility for cancer survivors facing logistical barriers while maintaining the core benefits of rehabilitation. However, future adaptations should carefully consider how to preserve opportunities for peer interaction and community building, given the central role that camaraderie played in participants' experience of the HEART-ACT program.

The physical and emotional benefits described by participants are consistent with prior studies examining CR and exercise-based rehabilitation programs among breast cancer and other cancer survivors. [8, 19] Previous research has demonstrated improvements in functional capacity, physical activity participation, fatigue, and quality of life following CR-based interventions.[8, 19] Participants in HEART-ACT similarly reported improvements in exercise tolerance, pain, sleep quality, blood pressure control, and overall physical well-being. In addition, many participants described increased confidence in their ability to maintain healthy behaviors, reduced anxiety surrounding their cancer history and future health, and greater self-efficacy in managing their health. These findings align with prior evidence that comprehensive rehabilitation programs can improve psychological well-being and reduce stress among cancer survivors. [8, 20] Notably, participants frequently highlighted the enjoyment they derived from program activities, particularly group movement and dancing sessions. While enjoyment is not always emphasized in rehabilitation research, our findings suggest that incorporating fun and engaging activities may enhance participant satisfaction and foster sustained engagement with healthy lifestyle behaviors.

One of the most salient findings was the value participants placed on camaraderie and social support. Many participants described developing meaningful relationships with fellow breast cancer survivors and viewed these connections as an important source of encouragement, accountability, and emotional support. Participants reported learning from one another, sharing experiences, and feeling less isolated in their survivorship journey. These findings are consistent with prior studies demonstrating that social support within exercise and rehabilitation programs can reduce feelings of isolation, promote resilience, and improve adherence to physical activity among cancer survivors.[21, 22] The group-based structure of HEART-ACT appeared to create a sense of community that extended beyond the exercise component of the program and may represent an important mechanism through which rehabilitation interventions influence health behaviors and psychosocial outcomes.

Participants reported mixed experiences with the technology incorporated into the intervention. Many found the Fitbit and useful for tracking activity, monitoring progress, and motivating exercise, particularly after receiving assistance with setup and use. However, some participants experienced difficulty using technology or felt overwhelmed by aspects of remote monitoring. These findings are consistent with prior literature suggesting that wearable devices can increase physical activity and support health behavior change among cancer survivors but may require ongoing technical assistance and individualized support to maximize effectiveness. [23, 24] A systematic review of wearable technology among breast cancer survivors found generally high adherence rates, suggesting that wearable devices can be successfully integrated into survivorship programs when adequate support is provided. [25]

Several limitations should be considered when interpreting these findings. First, this qualitative analysis reflects the experiences of a relatively small sample of participants from a single safety-net healthcare system, which may limit generalizability to other populations and settings. Second, participants who completed exit interviews may have had more favorable experiences than those who did not participate in interviews, introducing the potential for selection bias. Third, interviews were conducted shortly after program completion and therefore capture short-term perceptions rather than long-term maintenance of behavior change. Future studies should examine whether the benefits and behavioral changes described by participants are sustained over time and explore experiences in larger and more diverse populations.

In conclusion, participants in the HEART-ACT cardiac rehabilitation program described meaningful physical, emotional, and social benefits from participation. Social support from fellow survivors and program staff emerged as particularly important contributors to engagement and satisfaction. At the same time, participants identified practical barriers and varying levels of comfort with technology that should be addressed in future implementation efforts. These findings support the potential of tailored CR programs to improve both physical and psychosocial outcomes among breast cancer survivors.

Declarations

Ethics Approval

This study was reviewed and approved by the UCSF IRB (#23-40216). All participants provided written, informed consent. This study was conducted in accordance with the Declaration of Helsinki. Clinical trial number: not applicable.

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Author Contribution

C.C, E.S, J.L, R.O, and A.B coded and analyzed interview transcripts. C.C wrote the main manuscript text. All authors reviewed and edited the manuscript.

Data Availability

Interview recordings and transcripts were stored securely to protect participant confidentiality. The data are available from the corresponding author upon reasonable request, subject to applicable ethical and confidentiality considerations.

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