

Attitudes and Beliefs of Older Female Breast Cancer Survivors and Providers About Exercise in Cancer Care

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OBJECTIVES: To understand breast cancer survivors' and providers' attitudes and beliefs regarding exercise counseling and structured exercise programs within cancer care.

SAMPLE & SETTING: 61 female breast cancer survivors and 11 breast cancer providers from a university cancer center in the Pacific Northwest.

METHODS & VARIABLES: Survivors completed anonymous self-report surveys, and providers participated in semistructured interviews. Survey data were analyzed using descriptive statistics, and interview transcripts were analyzed using qualitative content analysis.

RESULTS: Breast cancer survivors and providers believed that including exercise counseling within cancer care was important. More than half of the survivors reported that they would attend structured exercise classes; a majority of providers thought cancer centers should offer exercise programs.

IMPLICATIONS FOR NURSING: Nurses could facilitate exercise counseling within cancer care and advocate for clinic-based exercise programs.

KEYWORDS breast cancer; exercise; exercise counseling; clinic-based exercise programs

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Breast cancer is the most common cancer diagnosed in women in the United States, who have a 12.8% lifetime risk of the disease (National Cancer Institute, n.d.). The five-year postdiagnosis relative survival rate of female invasive breast cancer is 89.9% (National Cancer Institute, n.d.), and the 15-year postdiagnosis relative survival rate is 80% (American Cancer Society, 2019). The continually improving prognosis for breast cancer has resulted in more than 3.8 million U.S. women with a history of breast cancer being alive as of January 1, 2019 (American Cancer Society, 2019). As survivors live longer postdiagnosis and as the number of breast cancer survivors is projected to increase, the long-term effects of breast cancer treatment become an increasing concern that should be addressed early in the breast cancer care trajectory. Persistent treatment-related side effects with long-term consequences are bone and muscle loss and fat gain (Cameron, Douglas, Brown, & Anderson, 2010; Santen, 2011; Vance, Mourtzakis, McCargar, & Hanning, 2011) that collectively increase the risk of frailty, falls, fractures, disability, and obesity-related diseases, such as cardiovascular disease. For example, a majority of breast cancer survivors experience bone loss related to treatment and age (Saad et al., 2008; Suskin & Shapiro, 2018) and are 1.3–1.5 times more likely to be diagnosed with osteoporosis than women without breast cancer, with older women at higher risk because of increased age (Hill et al., 2014; Peppone et al., 2014). The estimated health-care cost (i.e., initial treatment, continuing care, and end-of-life care) in 2020 for breast cancer is \$20.5 billion, with the greatest increase in breast cancer care expenditures attributed to the continuing care of survivors (Mariotto, Yabroff, Shao, Feuer, & Brown, 2011). To minimize the burden and cost of breast cancer on a survivor's long-term health, it is critical to

develop strategies that can address these persistent side effects and implement them into routine cancer care.

Exercise is one approach to addressing these long-term consequences. The recommended amount of physical activity for adults to achieve health benefits is 150 minutes of moderate physical activity per week (U.S. Department of Health and Human Services, 2018), and this is also the recommended amount for cancer survivors (Schmitz et al., 2010). Structured and group-based exercise interventions have been successful in improving the health effects of breast cancer and its treatment (Keogh & MacLeod, 2012; Segal et al., 2017). For example, Winters-Stone et al. (2011, 2013) developed and tested a structured, group-based exercise program to counter the treatment-related bone and muscle loss and fat gain common in breast cancer survivors. Their program, Prevent Osteoporosis With Impact + Resistance (POWIR), has established efficacy and would be ready for translation to practice (Winters-Stone et al., 2011, 2013; Winters-Stone, Leo, & Schwartz, 2012). However, such evidence does not automatically lead to uptake by clinical practice, creating a gap between research knowledge and practice that leaves most breast cancer survivors underserved. There is a large body of evidence regarding the benefits of exercise in breast cancer survivors. In response, research has examined the barriers and facilitators to implementing exercise counseling within cancer care (Pong, Faulkner, Jones, & Sabiston, 2018; Keogh et al., 2017; Nadler et al., 2017; Smith-Turchyn, Richardson, Tozer, McNeely, & Thabane, 2016) and to developing community-based exercise programs for cancer survivors (Musanti & Murley, 2016; Schwartz, de Heer, & Bea, 2017); however, there is minimal research that explores the implementation of supervised exercise programs within routine oncology care (Karvinen, Carr, & Stevinson, 2013; Santa Mina et al., 2012). Therefore, the aim of this study was to gain insights into attitudes and beliefs regarding exercise counseling and structured exercise programs from the perspectives of breast cancer survivors and providers. Learning about the shared and discrepant viewpoints between survivors and providers can inform approaches to implement exercise counseling and reinforce the need for embedding exercise programs within cancer care.

Methods

A convergent parallel mixed methods design was used to gain an understanding of breast cancer survivors' and providers' perspectives on exercise counseling and referral and participation in a structured,

group-based exercise program within cancer care. Quantitative and qualitative data were collected in parallel, analyzed separately, and then merged to compare the perspectives of breast cancer survivors and providers. This study was guided by the Consolidated Framework for Implementation Research (CFIR). This framework was derived through a comprehensive synthesis of the implementation literature (Damschroder et al., 2009). There are five domains that influence implementation within this framework: inner setting, outer setting, characteristics of individuals involved, implementation processes, and intervention characteristics. The study was approved by the Oregon Health and Science University (OHSU) Institutional Review Board (IRB).

Quantitative Data

Sample: The sample was selected from an IRB-approved data repository that aggregated information from participants enrolled in one of four randomized controlled exercise trials in female cancer survivors. Three of the four studies enrolled only breast cancer survivors (NCT00659906, NCT00591747, NCT00665080), and the fourth enrolled women with any cancer (NCT01635413). Depending on the particular study, women had to have received chemotherapy and/or radiation therapy for their breast cancer. Metastatic disease was an exclusion criterion for all trials; as a result, only women with early-stage cancer (I–III) could potentially be enrolled. Only breast cancer survivors in the repository were invited to participate in this ancillary study, and there were no other exclusion or inclusion criteria for this convenience sampling.

Data collection: Emails were sent to all breast cancer survivors in the research repository with an explanation of the study, including a statement of consent (consent was implied if they continued to the survey) and a link to the online questionnaire using a highly secure, encrypted web-based research data collection and management system. Following the email invitations, women with no email address listed on the repository or with undeliverable email addresses were invited to participate via mailings sent through the United States Postal Service, which included the same study explanation, statement of consent, and a hard-copy survey with a self-addressed stamped envelope to return materials to the study team. Data were collected over the course of four months (mid-August to mid-December 2016).

Survey: The anonymous self-report survey was developed for this study and had questions regarding

basic demographics and breast cancer treatment and diagnosis. The survey consisted of questions regarding perceptions about participation in a structured exercise program, such as location and frequency of class, type of exercise, willingness to commit to a yearlong program, and exercise counseling preferences, including timing and type of provider. These questions listed multiple choices, and respondents could endorse more than one choice per question. Questions were developed based on the literature regarding cancer survivors' perceptions of and preferences for exercise counseling and programs, and they were guided by CFIR (survivors' preferences are the outer setting in CFIR).

The 13 items of the Outcome Expectations for Exercise Scale (Cronbach alpha = 0.89) were used to inquire about exercise benefits (Resnick, Zimmerman, Orwig, Furstenberg, & Magaziner, 2000); in the current sample, the Cronbach alpha was 0.94. Five items describing additional exercise benefits were taken from the Exercise Benefits/Barriers Scale (Cronbach alpha = 0.952) (Sechrist, Walker, & Pender, 1987); in the current sample, the Cronbach alpha for these five items was 0.81. For these five items from the Exercise Benefits/Barriers Scale, participants rated statements on a four-point Likert-type scale with options ranging from strongly agree to strongly disagree. Six items describing barriers to exercise also were taken from the Exercise Benefits/Barriers Scale (Sechrist et al., 1987); the Cronbach alpha for these six items in the current sample was 0.62.

In addition, seven statements from a barrier and benefits questionnaire developed by Gho, Munro, Jones, and Steele (2014) was used; the questionnaire had an interclass correlation coefficient of 0.82, and the Cronbach alpha in the current sample was 0.76. Nine additional statements regarding barriers were added based on the literature; participants rated the extent that these barriers would keep them from exercising on a four-point Likert-type scale with options ranging from not at all to a lot. Participants were also asked about their typical physical activity in a given week using the seven-item International Physical Activity Questionnaire–Short Form (IPAQ-SF), which had test-retest reliability for adults in the United States ranging from 0.66 to 0.81 (Craig et al., 2003). Questions were asked about days per week and minutes per day of at least 10-minute bouts of vigorous and moderate activity, as well as days per week and minutes per day of walking and sitting. The survey as a whole was kept brief, with a total of 50 questions; it could be completed in about 15 minutes.

Analysis: Data were analyzed using IBM SPSS Statistics for Windows, version 24.0. Descriptive statistics were calculated, including mean, distribution, and percentages. Physical activity was categorized as light, medium, or high using the IPAQ-SF scoring protocol (IPAQ Research Committee, 2005).

Qualitative Data

Sample: Breast cancer care providers, including oncologists (medical, surgical, radiation), nurse practitioners, RNs, social workers, and administrators, working at a cancer care center within an urban academic health center in the Pacific Northwest were recruited.

Data collection: A researcher (K.W.-S.) who had established relationships with some of the breast cancer providers through previous collaboration sent an invitation via email to 21 breast cancer providers in the breast cancer clinic; nurses working on the inpatient units who care for individuals with breast cancer were not included. One follow-up email was sent to nonresponders. Semistructured interviews were conducted individually with each provider by a trained PhD student (W.B.A.) in the provider's office; these lasted about 20–30 minutes. Informed consent was completed prior to the interviews, and participants were compensated for their time with a \$10 gift card. All interviews were audio recorded and transcribed verbatim.

Interviews: An interview guide, informed by CFIR (addressing the inner setting, characteristics of individuals involved, implementation processes, and intervention characteristics) and based on insights from the literature on exercise counseling and factors affecting implementation of evidence-based interventions within clinical settings, was used. The interviews began with a description of a structured, group-based yearlong exercise program for breast cancer survivors (the POWIR program); participants were asked to consider this program when answering questions. Questions focused on providers' perceptions of their role in providing exercise counseling, thoughts on the most appropriate time in the cancer care continuum to provide exercise counseling, motivation to include exercise counseling in routine cancer care, views on survivors' motivations and barriers, ideas on how to implement counseling and referral within the clinic, and identification of key stakeholders. Probes were used during interviews to gain more in-depth descriptions and achieve further exploration of topics (see Figure 1).

Analytic strategy: Qualitative content analysis was used, with a goal of obtaining qualitative descriptions

(i.e., straightforward descriptions using everyday terms that stay close to the data and are less interpretive than other qualitative approaches) (Neergaard, Olesen, Andersen, & Sondergaard, 2009; Sandelowski, 2000). Prior to analysis, the interview transcripts were checked for accuracy against the interview audio recordings. Each interview transcript was read as a whole to get a sense of the overall meaning. Line-by-line coding was done to achieve thorough coverage of data. Two research team members reviewed and coded all transcripts independently, compared and categorized codes, and identified themes from the categories. During this process, a codebook was developed to document codes and definitions. Atlas.ti 7 was used to organize codes into categories and themes and to calculate frequencies within themes.

Results

Quantitative

Of the 195 emails that were initially sent out to breast cancer survivors in August 2016, including a reminder

email sent one month later, 26 emails failed to deliver and 35 complete surveys were returned, resulting in a participant response rate of 21%. In October 2016, 60 hard-copy surveys were mailed to women in the research repository list who did not have an email address listed or had undeliverable email addresses. Six packets were returned to sender and 26 completed hard-copy surveys were returned, resulting in a participant response rate of 48%. A total of 61 female breast cancer survivors participated in this study. A majority of survivors responded that they were White and non-Hispanic ($n = 58$ and 56 , respectively). In addition, 57 had partial college education or higher, and 45 were retired. More than half ($n = 35$) were overweight or obese, and about one-third ($n = 20$) exercised for at least 150 minutes at a moderate level of intensity each week. The average age of participants was 72.4 years ($SD = 9.8$), with a range of 51–90 years, and the average time from diagnosis was 15.5 years ($SD = 4.9$), with a range of 9–42 years (see Table 1).

FIGURE 1. Cancer Care Provider Interview Guide

- Do you currently counsel your patients regarding their physical activity?
 - How much time could you reasonably spend counseling patients on physical activity?
 - Are there specific patient characteristics that would make you more likely to counsel about physical activity or exercise? If yes, what are they?
 - How important is counseling on physical activity?
- How comfortable are you with counseling and/or informing your patients on physical activity and exercise?
 - What would help you to be more comfortable counseling your patients?
 - Do you feel that you have the knowledge to refer a patient to a specific program?
- When is the most appropriate time to initiate exercise counseling?
- How important is exercise counseling to providers in this clinic?
 - What factors do you think can influence the level of support the clinic has for physical activity and exercise counseling?
 - To what extent does the existing clinic flow support time for exercise counseling?
 - What factors would affect incorporating exercise counseling into clinic appointments?
- Who is the most appropriate team member to provide counseling—nurse, surgeon, oncologist, social worker? Are there other appropriate team members not mentioned?
- What do you view as your role to support patients in continuing exercise?
- What are your thoughts about referring patients to this specific exercise program?
 - Do you feel that this specific program would benefit your patient population?
 - How do you think a referral could be made? Through the electronic health record?
 - What factors would influence making a referral?
- Who would you identify as a key stakeholder or leader in promoting physical activity and referral to the exercise program in the clinic?
- Do you think hospitals should provide exercise for recovery following cancer treatment?
- Which patients with cancer do you feel should not exercise?
 - Are there specific characteristics of patients that would prevent you from counseling them on exercise?
- Are there high-priority initiatives already taking place in the clinic?
 - Do you foresee these priorities affecting implementation of physical activity counseling and referral to this specific program?
- Is there anything else I did not ask about that you would like to mention?

Survivors indicated that they would most like to receive information regarding exercise from their primary care provider or obstetrician/gynecologist (n = 25), followed by medical oncologist (n = 22), surgical oncologist (n = 12), nurse (n = 9), and radiation oncologist (n = 7); 22 indicated no preference. Participants reported that they would most like to hear about exercise for people with cancer at any time during care (n = 21), right after completing primary treatment for cancer (n = 16), when the medical team determines it is appropriate (n = 14), 6–12 months after primary treatment (n = 9), or when first diagnosed with cancer (n = 6).

Lack of convenient exercise facilities was found to be a main barrier to exercise (42 were affected a lot or some). Although barriers to exercise were present, a majority of the participants (47 strongly agreed or agreed) indicated that exercise is an activity that they enjoy, that it makes them feel better physically (60 strongly agreed or agreed), that it improves their mood (57 strongly agreed or agreed), and that it helps to get their mind off cancer (44 strongly agreed or agreed). Many indicated that they would commit to a yearlong exercise program (27 responded “yes,” and 27 responded “maybe”) and would be interested in a group exercise program with breast cancer survivors (32 responded “yes,” and 36 responded “maybe”).

Qualitative

Emails were sent to 21 breast cancer providers, and 11 providers were ultimately interviewed (1 medical oncologist, 1 radiation oncologist, 1 surgical oncologist, 1 nurse practitioner, 3 RNs, 3 social workers, and 1 provider with an administrative role). One oncologist was male and one of the social workers was male; the remaining nine providers were women. The main themes that emerged from the analysis of the transcripts were as follows: barriers to exercise counseling, facilitators to exercise counseling, beliefs about exercise counseling, perceived patient barriers to exercising, beliefs about exercise in breast cancer survivors, and implementation strategies.

Barriers to exercise counseling: Most (n = 8) of the cancer care providers talked about the amount of information that they need to cover in appointments and cited lack of time as a significant barrier to engaging in exercise counseling during appointments. A lack of space and the need to turn over rooms were identified as additional barriers by four providers. As one provider stated, “Things just get so busy, and there’s often so much else to talk about regarding medications and other side effects that

TABLE 1. Survivor Characteristics (N = 61)

Characteristic	n
Body mass index	
Underweight	3
Healthy weight	22
Overweight	22
Obese	13
Breast cancer spread to other parts of body	
Yes	6
No	52
Do not know	3
Breast cancer stage	
I	18
II	16
III	7
Do not know	18
Education	
Partial high school	1
High school graduate	2
Partial college or specialized training	19
Bachelor’s degree	15
Graduate school or professional training	23
Employment	
Part-time	7
Full-time	8
Retired	45
Homemaker	1
IPAQ-SF physical activity status	
Low	21
Medium	16
High	24
Lymphedema diagnosis	
Yes	14
No	45
Do not know	2
Marital status	
Married	35
Widowed	12
Divorced	10
Single	1

IPAQ-SF—International Physical Activity Questionnaire—Short Form

Note. IPAQ-SF physical activity status is as follows: High is having at least 1 hour of moderate intensity physical activity daily; medium is 1 half-hour of at least moderate intensity physical activity during most days of the week; low is not meeting the criteria for the high and low categories.

Note. Numbers may not sum to total due to missing data.

sometimes exercise doesn't make the top of the priority list." Another provider said, "The issue is just more time." In addition, six providers indicated that survivors were overloaded with information and that exercise was not a priority during the appointment:

Then some of it has to do with cues from the patient and what they're willing to talk about or not. . . . They get overloaded, and you can tell that their brain's shutting down and they've absorbed all of the information they can absorb for today.

Another provider shared similar observations:

Sometimes in our earliest encounters, I don't know whether it's a good time. Some people, they're so overwhelmed by the acute treatment phase of their cancer that I'm not sure they'd be emotionally or just ready to add something else.

Concern regarding the stamina and status of the survivor was identified as a barrier to counseling by three providers.

Facilitators to exercise counseling: Survivors' motivation and interest in taking control of their health were the main facilitators for engaging in exercise counseling and education that were noted by all providers:

I think our breast cancer [survivors] are particularly motivated in that regard. It's often our breast cancer [survivors] who take advantage of the support services, things like yoga and mindfulness-based stress reduction. So, I think breast cancer [survivors] are a great audience to target because they're so motivated.

Four providers commented on determining the survivor's level of readiness or motivation and tailoring messaging based on that:

I usually will be looking for readiness. And there are some [survivors] that don't really exhibit that yet. They're not at the point where they're ready to start something. And so, at that point, it's really just to encourage them, getting them some ideas as to what they can do.

Another provider expanded on this:

What I do is I see kind of what someone's baseline is and if they're someone who exercises a lot. I'll

try to counsel them on how to adapt if they're feeling fatigued and encourage them to exercise up to the level of tolerance.

Beliefs about exercise counseling: All providers identified post-treatment as an ideal time for exercise counseling; however, some noted that encouraging exercise during treatment was beneficial and important:

I think if you wait until after treatment, you've missed a really great window. I think you need to get people staying active so that they don't lose strength, so that their [strength] stays better through treatment. . . . After treatment's too late in the game; then you're doing catchup.

Perceived patient barriers to exercising: Providers suggested a variety of barriers for survivors engaging in exercise; however, there was no consensus or agreement on barriers. Barriers noted included cost, fear of harming self, lack of time, lack of resources, and fear of cancer recurrence.

Beliefs about exercise in breast cancer survivors: All providers described the physical and mental health benefits from exercise, including improvements in symptoms, such as sleep, mood, and fatigue, and side effects of treatment, such as bone loss and weight gain. A few talked about the belief that patients with breast cancer are more fit and less ill compared to other patients with cancer. One provider stated, "I've always encouraged [survivors] to stay physically very active while they're on treatment, particularly if they're on chemotherapy, because people get debilitated very quickly." Another provider added that exercise "combats depression. And that's something that can come on right after treatment oftentimes because they're dealing emotionally with what they've just gone through and the changes in their life related to that."

Implementation strategies: Providers suggested a variety of strategies that could be implemented to enhance exercise counseling and referral to a structured program, including the following:

- Using reminders in the electronic health record (EHR) and visual cues (e.g., posters in examination rooms)
- Integrating a referral system and templates within the EHR
- Engaging and informing providers

All providers noted that exercise counseling is a team effort involving various providers, surgeons,

physicians, nurses, social workers, and physical therapists, as well as the survivor's support person or family members. Many of the providers (three nurses, two physicians, two social workers) thought that exercise counseling could be nurse driven. All providers commented that the counseling needs to take minimal time and be a part of routine care. Although most providers acknowledged that covering the cost of structured exercise programming is a concern and that insurance reimbursement would be limited, they thought that the cancer center should provide structured exercise programming for survivors:

I really believe [that meeting] the needs of cancer survivors is becoming a public health issue, and it really fits with the triple aim in terms of reducing readmissions, improving efficacy of care, improving patient satisfaction. I think if we can tie exercise to all of those goals, then we help the hospital achieve its value of trying to meet the triple aim.

Merged Quantitative and Qualitative Results

The authors compared the codes and frequencies to survey responses that pertained to providers and survivors (see Table 2). A majority of breast cancer survivors indicated that oncologists should provide exercise counseling, and most providers thought that it could be part of routine cancer care and reinforced by multiple members of the healthcare team. Although almost all of the providers thought that post-treatment was the most suitable time for counseling, almost half of the breast cancer survivors preferred this time point (either right after completing primary cancer treatment or 6–12 months after completing primary cancer treatment), with just a few preferring to receive counseling when first diagnosed. There was little agreement regarding survivors' barriers to exercise. Cost was the most cited barrier by providers; however, this was not among the barriers reported by survivors. Providers and survivors held similar beliefs about the benefits of exercise in breast cancer survivors, in particular that exercise improves mental health and mood, physical health, and sleep and fatigue. Many of the providers thought that a group exercise program could be provided by the hospital, and a majority of survivors indicated that they would be willing to attend exercise classes at the cancer center. There seems to be agreement among survivors and providers regarding the benefits of exercise and the importance of including counseling and programming in routine cancer care.

Discussion

Breast cancer survivors' and providers' attitudes and beliefs about exercise and exercise counseling and programming were assessed. Most providers cited the amount of information that they need to cover and the lack of time during an appointment as significant barriers, and they noted patients' motivation and interest as significant facilitators to engaging in exercise counseling. Providers felt that exercise counseling needed to be a team effort and could be facilitated by nurses. Survivors reported that they wanted to receive exercise counseling but were divided about the ideal time in the cancer care continuum to receive such counseling. Survivors and providers believed that including exercise counseling in cancer care was important.

There has been a call for integrating exercise counseling within cancer care (Karvinen et al., 2013; Santa Mina et al., 2012; Schwartz et al., 2017). Breast cancer survivors in this study and in other studies (Gjerset et al., 2011; Jones & Courneya, 2002; Vallance, Lavalley, Culos-Reed, & Trudeau, 2013) have stated that they want to have exercise counseling as part of their cancer care. However, most women are not routinely receiving exercise counseling during their cancer care. In a study by Daley, Bowden, Rea, Billingham, and Carmicheal (2008), a majority of breast cancer survivors reported not receiving exercise counseling during their cancer care; a study by Sabatino et al. (2007) observed that survivors were less likely to report receiving exercise counseling than patients without a history of cancer.

Providers in the current study indicated that integrating exercise counseling into cancer care was important; however, they indicated that there are barriers to doing so, including lack of time, lack of space, its being a low-priority goal, and concern over the survivor's health status. These barriers have been reported in other studies (Fong et al., 2018; Keogh et al., 2017; Smith-Turchyn et al., 2016). Additional research into how best to integrate exercise counseling within routine cancer care is recommended (Fong et al., 2018).

When exercise recommendations by oncologists have been integrated into cancer care, there have been mixed results. In a study by Jones, Courneya, Fairey, and Mackey (2004), exercise recommendation alone led to an increase in survivors' exercise; survivors who recalled receiving a recommendation from the oncologist one week later had greater increases in exercise. However, a study by Park et al. (2015) found that exercise recommendation alone was not sufficient to increase survivors' exercise

TABLE 2. Comparison of Exercise Beliefs and Attitudes: Cancer Care Provider Interview Codes and Frequency and Breast Cancer Survivor Survey Responses

Qualitative Theme	Cancer Care Providers (N = 11)	Breast Cancer Survivors (N = 61)
Beliefs about exercise counseling	<ul style="list-style-type: none"> ■ It should be a team effort (n = 11). ■ Post-treatment is the most suitable time (n = 9). ■ It can be a nurse-driven activity (n = 7). ■ It can be done in 5–10 minutes (n = 5). 	<ul style="list-style-type: none"> ■ Who should provide cancer-specific exercise counseling? <ul style="list-style-type: none"> □ Primary care provider or obstetrician/gynecologist (n = 25) □ Medical oncologist (n = 22) □ Surgical oncologist (n = 12) □ Nurse (n = 9) □ Radiation oncologist (n = 7) □ No preference (n = 22) ■ Timing preference for exercise counseling <ul style="list-style-type: none"> □ When first diagnosed with cancer (n = 6) □ Right after completing primary cancer treatment (n = 16) □ 6–12 months after completing primary cancer treatment (n = 9) □ When medical team determines it is appropriate (n = 14) □ Any time (n = 21)
Perceived patient barriers to exercising	<ul style="list-style-type: none"> ■ Cost is the most common barrier to patient exercise (n = 2). ■ Fear of harming self (n = 1) ■ Fear of recurrence (n = 1) ■ Lack of resources (n = 1) ■ Lack of time (n = 1) ■ Risk of fracture (n = 1) ■ Transportation (n = 1) 	<ul style="list-style-type: none"> ■ Breast cancer survivors stated that the following are barriers preventing them from exercising^a: <ul style="list-style-type: none"> □ Lack of convenient facilities (n = 42) □ Inconvenient times for exercise (n = 37) □ No instructor to guide exercise (n = 31) □ Lack of time (n = 18) □ No one to exercise with (n = 18) □ Fatigue (n = 16) □ Transportation problems (n = 15) □ Other health problems in addition to cancer (n = 14) □ Lack of understanding about how to exercise (n = 12)
Beliefs about exercise in breast cancer survivors	<ul style="list-style-type: none"> ■ Benefits of exercise <ul style="list-style-type: none"> □ Exercise promotes physical health (n = 11). □ Exercise helps with treatment (n = 9). □ Exercise aids mental health (n = 7). □ Exercise assists with sleeping (n = 4). □ Breast cancer survivors are more fit and less ill (n = 2). 	<ul style="list-style-type: none"> ■ Breast cancer survivors indicated that exercise does the following^b: <ul style="list-style-type: none"> □ Makes them feel better physically (n = 60) □ Improves their mood (n = 57) □ Helps to strengthen their bones (n = 57) □ Makes them more mentally alert (n = 57) □ Improves their endurance in performing daily activities (n = 56) □ Helps them feel less tired (n = 54) □ Improves their self-esteem (n = 51) □ Is an activity they enjoy (n = 47) □ Helps to get their mind off cancer (n = 44)

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TABLE 2. Comparison of Exercise Beliefs and Attitudes: Cancer Care Provider Interview Codes and Frequency and Breast Cancer Survivor Survey Responses (Continued)

Qualitative Theme	Cancer Care Providers (N = 11)	Breast Cancer Survivors (N = 61)
Implementation strategies	<ul style="list-style-type: none"> ■ Counseling is added as routine care (n = 9). ■ The electronic health record can be used for referral (n = 9). ■ Exercise classes/services can be provided by hospitals (n = 5). ■ The exercise program can take place at the facility (n = 4). 	<ul style="list-style-type: none"> ■ Timing preference to start exercise program <ul style="list-style-type: none"> □ When first diagnosed with cancer (n = 13) □ Right after completing primary cancer treatment (n = 10) □ 6–12 months after primary cancer treatment (n = 6) □ When medical team determines it is appropriate (n = 16) □ Any time (n = 22) ■ Locations participants are able and willing to attend exercise class <ul style="list-style-type: none"> □ Cancer center, clinic, or medical facility (n = 33) □ Community center (n = 30) □ Medical health center (n = 30) □ Health club (n = 28) ■ Number of days a week women are able and willing to exercise <ul style="list-style-type: none"> □ 2 days (n = 21) □ 3 days (n = 21) □ 4 days (n = 7) ■ Amount of time able and willing to exercise per session <ul style="list-style-type: none"> □ 30 minutes (n = 17) □ 45 minutes (n = 20) □ 60 minutes (n = 37) □ 90 minutes (n = 9)

^a Values represent those who responded some or a lot.

^b Values represent those who responded agree or strongly agree.

Note. Frequency of codes is the number of providers who endorsed that code during the interview.

Note. Breast cancer survivors could choose more than one survey response; as a result, numbers may exceed the total.

level and that the addition of motivational materials was necessary. A study by Winters-Stone et al. (2018) determined that survivors who received exercise recommendation plus an exercise DVD better maintained their exercise levels and reported less fatigue eight weeks later compared to women who received exercise recommendation only and reported declines in exercise and worsening fatigue over time. In each of these studies, the recommendation came from just the oncologist. In the current study, the providers believed that exercise counseling was a team effort and that nurses could lead this effort. As a result, a team approach involving multiple members of the healthcare team providing exercise counseling and the inclusion of materials or

referral to a structured exercise program could be an effective approach for survivors to hear and recall the message and enact the recommendations.

Breast cancer survivors are interested in structured exercise programming. In the current study, most of the breast cancer survivors indicated that they would commit to a yearlong exercise program and would be interested in a group exercise program with breast cancer survivors or other female cancer survivors; however, it is important to note that the participants in the current study may have been biased by their previous enrollment in a clinical exercise trial. Similarly, other breast cancer survivors have reported a preference for structured, group-based exercise programming (Karvinen,

Raedeke, Arastu, & Allison, 2011; Vallance et al., 2013). Breast cancer survivors who have participated in structured, group-based exercise programs reported appreciating the support and acceptance from others and feeling safe (Balneaves et al., 2014; Emslie et al., 2007). Supervised exercise classes have been shown to affect exercise adoption even five years after participation (Mutrie et al., 2012). Meta-analyses have shown that supervised and/or group-based exercise interventions result in greater outcomes (e.g., fitness, muscle strength) compared to unsupervised and/or home-based interventions in cancer survivors in general (Jones et al., 2011; Segal et al., 2017). Exercise programs that involve other breast cancer survivors could enhance the adoption and maintenance of exercise while providing a supportive and safe environment for exercise.

There are community-based exercise programs designed for cancer survivors in general and breast cancer survivors in particular (Musanti & Murley, 2016; Schwartz et al., 2017). For example, Livestrong® at the YMCA is a group-based exercise program for cancer survivors that has demonstrated positive outcomes (Heston, Schwartz, Justice-Gardiner, & Hohman, 2015; Schumacher & McNiel, 2018), and dragon boat teams (involving a canoe-like boat) for breast cancer survivors have been successful at improving outcomes for this population (Harris, 2012; Ray & Verhoef, 2013). In the clinic setting, physical and occupational therapists provide individual training and rehabilitation exercises for survivors; although this is important, it does not have the added benefit of support as with a group-based program. Survivors in the current study indicated an interest in group-based programs with other female survivors. Including structured exercise programs, such as the POWIR program, as part of cancer care within cancer centers is an important step in survivorship care that could potentially have a positive impact on the triple aim. The triple aim, initially defined by the Institute for Healthcare Improvement in 2008, refers to simultaneously attending to three goals in the provision of health care: “improving the individual experience of care; improving the health of populations; and reducing the per capita costs of care for populations” (Berwick, Nolan, & Whittington, 2008, p. 760). Because exercise has been shown to have a positive impact on treatment-related side effects, recurrence rates, and mortality (overall and breast cancer specific) (Spei et al., 2019; Stout, Baima, Swisher, Winters-Stone, & Welsh, 2017) and a structured, group-based exercise

KNOWLEDGE TRANSLATION

- Breast cancer survivors and providers agreed that exercise counseling and structured exercise programs should be part of cancer care.
- Among providers, the main barrier to exercise counseling was time, and the main facilitator was breast cancer survivor interest in exercise.
- Nurses could facilitate an effort to integrate exercise counseling and referral to structured exercise programming within cancer care.

program is desired by survivors, offering a structured, group-based exercise program addresses the three goals of the triple aim.

In the current study, the majority of survivors reported that they would attend a group-based exercise program in the cancer center. The providers in the current study thought a group-based supervised exercise program could be integrated within the existing physical rehabilitation program and either potentially reimbursed by insurance or offered without charge by the cancer center as part of comprehensive cancer care.

Limitations

Results of the current study need to be considered with the following limitations. The average survivor age in the sample was 72 years; survivors were at least 7 years from diagnosis, with the majority being more than 10 years from diagnosis; and most survivors were White and college educated. In addition, only 14 reported lymphedema. Survivors who are younger, closer to their diagnosis, non-White, not college educated, or experiencing lymphedema might have differing barriers and facilitators to exercise, and beliefs about exercise and exercise counseling. One-third ($n = 20$) of the survivors reported exercising at a moderate level of intensity for at least 150 minutes per week, which is a greater amount than is reported for older breast cancer survivors. In other studies in which physical activity was objectively measured by accelerometer, breast cancer survivors' average daily minutes of moderate to vigorous physical activity ranged from 3.7 to 32 minutes (Boyle, Vallance, Ransom, & Lynch, 2016; Lynch et al., 2010; Phillips et al., 2015; Thraen-Borowski, Gennuso, & Cadmus-Bertram, 2017). In addition, older cancer survivors in general were less active (Boyle et al., 2016; Thraen-Borowski et al., 2017). This pattern of younger women being more active than older women is also seen in the general population (Bennie, De Cocker, Teychenne, Brown, & Biddle, 2019). Based on these patterns of physical activity in women in general

and breast cancer survivors in particular, it would be expected that younger survivors would have greater levels of exercise and greater interest in a group-based exercise program.

Participant response to the web-based survey sent via email was low; a selection bias may be present, with those interested in exercise more likely to respond. The sample may not be representative of breast cancer survivors. In addition, all survivors had previously taken part in a cancer-related exercise study; as such, they potentially felt more favorably toward exercise-related programs for cancer survivors. This sample likely reflects the views of the subset of breast cancer survivors interested in engaging in an exercise program offered in the clinical setting because they initially showed an interest in participating in an exercise-focused clinical trial. In addition, the providers participating in the current study practiced at an urban academic medical center, and their opinions might not be generalizable to all cancer care providers.

Implications for Nursing

Nursing could facilitate the integration of exercise counseling and referral to structured exercise programs within cancer care. Oncology nurses report inquiring about and promoting exercise among their patients (Karvinen, McGourty, Parent, & Walker, 2012; Keogh et al., 2017; van Veen et al., 2017). However, they have reported lack of time, uncertainty regarding safety of exercise for survivors (Karvinen et al., 2012; Keogh et al., 2017), lack of structural support (Keogh et al., 2017), and uncertainty in what to recommend (Karvinen et al., 2012) as barriers to providing exercise counseling. Providing continuing education to practicing oncology nurses regarding exercise recommendations and counseling approaches could increase the number of oncology nurses who engage in exercise counseling with their patients. In addition, enhancing nurses' leadership skills could propel them to serve as change agents and facilitate the effort to implement exercise counseling and evidence-based structured exercise programs, such as the POWIR program, within routine cancer care. Within the hospital setting, clinical nurse leaders could serve as influential leaders in integrating exercise counseling and interventions within the inpatient setting (McGowan, 2016).

In the current study, all of the providers thought that exercise counseling could be performed as a team effort. The majority of survivors preferred hearing exercise counseling from a primary care provider or obstetrician/gynecologist, followed by a medical

oncologist, a surgical oncologist, a nurse, and a radiation oncologist; about one-third had no preference. A team approach in which multiple members of the healthcare team provide exercise counseling would meet the survivors' and providers' preferences while taking into account the time constraints on the oncologists and the nurses, with each adding to and reinforcing the information given by the other. Although there was some divergence between providers and survivors regarding the optimal time in the cancer continuum to initiate exercise counseling, almost half of the survivors and almost all of the providers in the current study indicated after primary treatment as the optimal timing. A counseling intervention with referral to a structured, group-based exercise program could be implemented at the end of primary treatment. In addition, nurses and other healthcare team members could briefly discuss the importance of exercise depending on a survivor's situation throughout treatment.

Conclusion

Breast cancer survivors and providers who took part in the current study reported that exercise counseling and structured exercise programs should be integrated within cancer care. Oncology nurses could facilitate the integration of exercise counseling and referral to structured exercise programs within cancer care. More research is needed on the dissemination and implementation of exercise counseling and a structured exercise program within cancer care.

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