

Factors related to oncology nurses' exercise counseling for management of fatigue of women during treatment for breast cancer

Abstract

Purpose: To identify and explore the predictors of nurses' exercise counseling for the management of fatigue of women during treatment for breast cancer.

Design: Descriptive correlational.

Setting: Registered nurses who were current members of the Oncology Nursing Society.

Sample: 115 nurses working in oncology settings, providing direct care to adult women receiving treatment for breast cancer.

Methods: Nurses completed a demographic questionnaire, an Exercise Questionnaire, two Exercise Beliefs, and one Exercise Counseling Behaviors Scales.

Main research variables: personal experience with exercise, exercise barriers beliefs, exercise benefits beliefs, exercise counseling behaviors.

Findings: Exercise barriers beliefs, the nurse's current position nurse, and knowledge about National Comprehensive Cancer Network (NCCN) guidelines predicted exercise counseling behaviors.

Conclusion: Nurses' beliefs about exercise barriers are most important to their exercise counseling for women with breast cancer and cancer-related fatigue (CRF).

Implications for nursing: Educational programs are needed to improve nurses' knowledge about standards of care for the treatment of CRF. Strategies need to be developed to assist patients to overcome barriers and promote nurses' exercise counseling behaviors.

Knowledge Translation

- i. Nurses who believe in the benefits of exercise, but also have strong beliefs that women with breast cancer experiencing CRF have many barriers to exercise, tend not to counsel them to exercise.
- ii. Nurses may need to explore strategies to increase their exercise counseling behaviors in the presence of their personal beliefs about exercise barriers.
- iii. Nurse leaders could mentor staff nurses to alter the impact of exercise barriers beliefs.

Keywords: exercise beliefs, fatigue, counseling, knowledge, behaviors, nurse leaders, cancer

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Abbreviations: NCCN, national comprehensive cancer network; ONS, oncology nursing society; ACS, American cancer society; CRF, cancer-related fatigue

Introduction

Cancer related fatigue is a distressing, persistent, subjective sense of physical, emotional and cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning.¹ A high incidence (249,260) of new breast cancer cases in women is projected for 2016, and over two million women are living with breast cancer (American Cancer Society,² 2016, National Cancer Institute.³ Women with breast cancer

have reported increases in fatigue levels described as moderate to severe, during the first two days following chemotherapy.^{4,5}

Moderate levels of exercise for at least 15 minutes three to five times weekly can reduce fatigue during chemotherapy treatment and up to six weeks after hospitalization, and can also improve vigor and vitality.⁶⁻¹⁰ Despite this knowledge, a little less than half the patients with CRF do not exercise due to physical, cognitive, and social reasons.^{11,12}

National clinical practice guidelines for managing cancer related fatigue recommend that healthcare professionals educate and provide exercise counseling by to patients who are in active treatment.^{1,13} Therefore to reduce CRF, it is imperative to provide exercise education

and counseling during treatment to motivate women with breast cancer to exercise, thus minimizing their fatigue. The Oncology Nursing Society Foundation came to the same conclusion after supporting the development of the Breast Cancer Care Quality Measure's set. One of the Quality measures was to ascertain the percentage of patients beginning chemotherapy who received counseling about exercise as an intervention to combat fatigue.¹⁴

Background and conceptual framework

Currently, nurses' management of fatigue is inconsistent with national treatment guidelines, which recommend that exercise counseling includes encouraging patients with CRF to exercise.^{1,15,16} According to the ONS, about 10% of patients with breast cancer received recommendation to exercise in order to reduce their fatigue.¹⁴

Nurses' management of illnesses is influenced by their beliefs about the effectiveness of the treatment. Treatment beliefs of nurses affected the degree to which they managed patients undergoing cervical cancer screening.¹⁷ Mental health nurses' negative treatment beliefs have also affected their level of adherence to guidelines for managing patients' illnesses.¹⁸ Physicians' beliefs in the benefits of prostate cancer screening also influenced how active they were in screening patients for prostate cancer, indicating that they were also not immune to the association of treatment beliefs and illness management behaviors.¹⁹

These studies suggests that oncology nurses' exercise counseling behaviors may also be influenced by their beliefs about exercise as a treatment for CRF in women with breast cancer, such that the beliefs about the benefits or barriers of exercise may influence them to either counsel or not counsel patients to exercise.

Conceptual framework

The Common Sense Model (CSM) of Self Regulation which guided this study proposes that individuals cope with their illness and treatment based on their understanding of the strategies for managing illness.²⁰ Illness management behaviors of patients and healthcare providers ("expert others") can be influenced by personal, social, and cultural factors.²¹⁻²³ Healthcare providers use their own beliefs about illness treatment to guide and advise patients in managing new or unusual symptoms.^{20,21}

Leventhal et al.²¹ State that a treatment belief can be multidimensional with an identity (e. g. label), control (e. g. control of symptoms), consequences and cost (e.g. symptoms and side-effects, financial costs) or benefits (e.g. improved quality of life). Treatment beliefs and illness management behaviors are influenced by personal contexts such as life experiences, institutional affiliations, and roles.²²

Leventhal et al.²¹ also theorize that treatment beliefs mediate the relationship between contextual factors, such as one's personal experience with treatment, and illness management behaviors. For example, medical students who were more physically active believed exercise counseling was important and, in turn, counseled their patients to exercise.²⁴ The literature suggests that personal factors among nurses such as personal experience with the treatment, may affect their beliefs about patient treatments and their illness management behaviors.²⁵ These findings suggest the relationship between nurses' personal experience with exercise and their exercise counseling behaviors may be mediated by their beliefs about exercise as a treatment for patients' CRF. There is little evidence of the extent to which oncology nurses' exercise beliefs influence their exercise

counseling behaviors. Therefore, a clear understanding of these beliefs are needed in order to inform and guide nurses' exercise counseling behaviors, and improve the quality of life of women being treated for breast cancer.

This study was the first in which the relationship among nurses' personal experience with exercise, their beliefs about exercise as a treatment for CRF, and their exercise counseling behaviors were examined. The author also explored whether exercise beliefs mediated (i.e. influenced) the relationship of personal experience with exercise and exercise counseling behaviors. The overall purpose was to identify and explore the predictors of Oncology nurses' exercise counseling for the management of fatigue of women during treatment for breast cancer.

Methods

The researcher used a descriptive, correlational design to examine nurses' reported personal exercise experience, exercise beliefs, and exercise counseling behaviors. The Institutional Review Board of Rutgers University of New Jersey approved the study.

Sampling and setting

An E-mail list of 2,000 addresses of nurses is the minimum required order by the ONS. The initial email transmission was sent to only 1822 randomly selected nurses, who comprised the convenience sample of current members of the Oncology Nursing Society. Eligible participants included nurses who worked in oncology settings, provided direct care to adult women receiving treatment for breast cancer, and those who could read and understand English, as the questionnaire was printed in English.

The participants were sent an informational letter via e-mail that explained the purpose of the study, an assurance of anonymity, and the participant's right to choose whether or not to participate. This letter also indicated that completion of the questionnaires would serve as the individual's consent to participate in the study, and were instructed to access the web link provided in the email to complete the questionnaires. Two reminder contacts resulted in a response rate of 7% (N=128), consistent with the response rates for online surveys ranging between 5-10%, as E-mails are more quickly dismissed and forgotten than mailed pencil and paper surveys.²⁶

Sample size was estimated from power analyses based on studies discussed in the literature review. For correlational analysis, using moderate effect size, $r=.30$, a sample size of 85 was needed to obtain a power of .80, and an alpha level of .05 with three predictor variables.²⁷ For regression analysis using a medium effect size, $r^2=.13$, a sample size of 88 was needed.

Measures

Data were collected from 128 nurses, who completed the Demographic questionnaire, the Godin Leisure Time Exercise Questionnaire, the Exercise Benefits, and Exercise Barriers Beliefs Scales, and the Exercise Counseling Behaviors Scale.

Demographic data included age, gender, marital status, current position, length of time working in that position, work status, highest degree earned, background, knowledge level of National Comprehensive Cancer Network clinical practice guidelines for cancer-related fatigue (a linear scale of zero to ten, 0 = not knowledgeable to 10= extremely knowledgeable), length of time

licensed as a registered nurse, length of time worked in an oncology setting, and certification in oncology nursing.

The Godin Leisure Time Questionnaire measured self-reported personal experience with exercise, and is designed to measure the usual leisure time exercise behavior levels (strenuous, moderate, mild) of the respondents.²⁸ Initial and subsequent coefficients for the strenuous, .98, $p < .05$ and .84, $p < .05$; moderate, .46, $p < .05$ and .36, $p < .05$; and mild, .48, $p < .05$ and .24, $p < .05$, intensity exercise levels, and the total weekly score, .74, $p < .05$ and .62, $p < .05$ has been established for this instrument.^{28,29} For this study, responses only allowed for the calculation of the participants' total time spent (minutes) in each level of exercise over a 7-day period that represented a typical exercise week in the past month.²⁸ This was done to capture the minimum minutes per week in each level (i.e., 150 minutes [2.5 hours] of moderate intensity exercise or at least 75 minutes [1.25 hours] of vigorous intensity exercise per week), recommended by the Centers for Disease Control and Prevention.³⁰ Participants who were not currently exercising were instructed to respond with a zero for each level of exercise intensity.

The 8-item *Exercise Benefits Beliefs scale* was developed to measure the beliefs that nurses have of the benefits of exercise for women with breast cancer experiencing CRF.³¹ It uses a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and items were summed with a range of 8 to 40; higher scores indicate favorable beliefs in the benefits of exercise. An example of the items includes: "exercise will improve quality of life." Face, content, and construct validity were established for this scale, with an alpha coefficient of .94. For this study the alpha coefficient was .95.

The 12-item *Exercise Barriers Beliefs scale* was developed to measure the beliefs that nurses have of the barriers to exercise for women with breast cancer experiencing CRF.³¹ It uses a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), and items were summed ranging from 12 to 60; higher scores indicate a greater belief in the barriers to exercise. An example of the items includes: "they are too sick to exercise." Face, content, and construct validity were established for this scale, with an alpha coefficient of .81. For this study the alpha coefficient was .82.

The 6-item *Exercise Counseling Behaviors Scale* was developed by the investigator to measure exercise counseling behaviors of nurses based on the NCCN Clinical Practice Guideline counseling recommendations for CRF, and were related to fatigue, energy conservation, and activity enhancement counseling strategies.¹ The scale established face and content validity through a panel of seven oncology nurse experts (1 nurse researcher, 2 oncology nurse practitioners, 2 outpatient oncology nurses, and 2 inpatient oncology nurses, all certified in oncology nursing. The content validity index (CVI) for this instrument was 1.00. The scale was administered via a Pilot Study to 378 oncology nurses. Principal Component's factor analysis was used to evaluate the initial construct validity of the scale, which was unidimensional with 6 items e.g. "I encouraged these patients to consider initiation of both endurance and resistance exercises." Cronbach's alpha was used to assess the internal consistency reliability; the alpha coefficient of the initial scale was .78. For this study the alpha coefficient was .79. It uses a 5-point Likert scale ranging from 1 (Never) to 5 (Always), and items were summed ranging from 6-30; higher scores indicating more engagement in exercise counseling.

Data analyses

Demographic, personal exercise experience, exercise benefits beliefs, exercise barriers beliefs, and exercise counseling behaviors data from the Survey Monkey database were imported and statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 19.0 for Windows.³² Descriptive statistics were used to analyze the demographic data in order to describe the sample characteristics.

Pearson Product Moment Correlation and chi-square for nominal level data were used to determine the relationships among the variables. All relationships were evaluated using a two-tailed alpha level of significance of .05, to reduce false positive results. Demographic variables with significant correlations with the dependent variable would need to be controlled in subsequent analyses.

Regression analyses were conducted to determine which of the three predictors (personal exercise experience, exercise benefits beliefs, exercise barriers beliefs) independently predicted counseling behaviors. To explore whether the relationship of personal experience with exercise and counseling behaviors were influenced by exercise beliefs mediation analyses were performed using Baron and Kenny's test for mediation.³³

Findings

Sample characteristics

Of the 128 nurses, 2 respondents' data were eliminated as 1 did not work in an oncology setting and 1 did not complete the survey. The remaining 126 nurses reported their current position as staff and charge nurses, managers, educators, and advanced practice nurses working in oncology settings and caring for women with breast cancer. Eleven outliers with a score range of 900 to 2360 minutes were deleted due to a severely skewed (z -score=12.9) distribution of scores of total time spent in exercise. This deletion resulted in mild skewness with no need for data transformation, and a sample of 115 participants was used for data analysis, which was more than required by the power analysis for statistical analyses.³⁴

On average the participants were middle-aged, married, Caucasian women who worked full time Table 1. Seventy-one percent of the nurses had a Baccalaureate degree or higher, and had more than 16 years of experience as a registered nurse. About 66% worked more than 10 years in an Oncology setting, and 75 were Board certified in Oncology Nursing.

The demographic questionnaire asked participants to rate the extent to which they were knowledgeable about the National Comprehensive Cancer Network (NCCN) guidelines for cancer treatment-related fatigue. Approximately 39.1% of nurses reported that they were not to somewhat knowledgeable (0-5) about NCCN guidelines for management of CRF, and a majority of nurses (60.9%) reported that they were moderately to extremely knowledgeable (6-10) about these guidelines.

Main variables

Scores were summed for all the variables and Table 2 presents the means, standard deviations and ranges of the variables. Factoring these statistics, nurses engaged in exercise counseling behaviors about 52% of the time, and believed that women with breast cancer and

CRF experienced barriers to exercise (67%). Nurses held a moderate belief (78%) that women with breast cancer experiencing CRF would benefit from exercising.

Table 1 Characteristics of the sample (N =115)

Variable	n	%
Age		
21-30	10	8.7
31-40	7	6.1
41-50	31	27
51-60	56	48.7
61-70	11	9.6
Gender		
Female	112	97.4
Male	3	2.6
Marital status		
Never been married	15	13.3
Married	77	68.1
Divorced	7	6.2
Widowed	5	4.4
Separated	1	.9
A member of an unmarried couple	8	7.1
Background		
African-American	1	.9
Asian	2	1.7
Caucasian	107	93
Filipino	2	1.7
Hispanic	2	1.7
Mixed Race	1	.9
Work status		
Full time	111	96.5
Part time	3	2.6
Per Diem	1	.9
Current position		
Staff nurse	62	54.1
Charge nurse	6	5.1
Nurse Manager	15	13.3
Nurse educator	13	11.2
Nurse practitioner	19	16.3
Experience in current position		
Less than 1 year	9	7.8
1-5 years	46	40.5
6-10 years	28	24.1
11-15 years	14	12.1
16-20 years	8	6.9
Over 20 years	10	8.6

Table Continued....

Variable	n	%
Highest nursing degree		
Diploma	10	8.6
Associate degree	23	19.8
Baccalaureate degree	49	43.1
Masters degree	33	28.4
Time licensed as a registered nurse		
1-5 years	13	11.3
6-10 years	10	8.6
11-15 years	10	8.6
16-20 years	15	13
Over 20 years	67	58.3
Time worked in an oncology setting		
Less than 1 year	1	.9
1-5 years	17	14.9
6-10 years	21	18.4
11-15 years	17	14.9
16-20 years	17	14.9
Over 20 years	42	36
Board certified in oncology nursing (OCN/AOCN)		
Yes	85	73.9
No	30	23.1
Knowledge about the NCCN guidelines for cancer treatment related fatigue		
0 (No knowledge)	3	2.6
1	3	2.6
2	4	3.5
3	11	9.6
4	5	4.3
5	19	16.5
6	21	18.3
7	19	16.5
8	15	13
9	8	7
10 (Very knowledgeable)	7	6.1

Only 8% of participants reported no level of engagement in exercise. A majority of participants (81%) reported engagement in mild exercise during the week with an average time spent of 101 minutes (1.7 hours). Eighty-two percent of participants reported engagement in moderate intensity exercise with an average time spent of 96 minutes (1.6 hrs). Forty-seven percent of participants reported engagement in strenuous exercise with an average time spent of 42 minutes (0.7 hours). Nurses spent an average of four hours of exercise per week across the intensity levels (Table 2 for time frames of levels of exercise and total exercise).

Table 2 Descriptive statistics of the study variables (N=115)

Variable	Mean	SD	Range
Total time spent in mild exercise	101.2	115.3	0-500
Total time spent in moderate exercise	96.5	94	0-420
Total time spent in strenuous exercise	42.5	67.5	0-420
Total time spent in exercise	240.2	192.3	0-720
Exercise Benefits Beliefs	33.2	4.8	8-40
Exercise Barriers Beliefs	34.3	5.5	14-44
Exercise Counseling Behaviors	21.5	4.7	12-30

Correlational analyses

Exercise benefits beliefs was inversely related to exercise barriers beliefs, $r=-.36$, $p<.01$. There was a significant and inverse relationship between exercise barriers beliefs and exercise counseling behaviors, $r=-.31$, $p<.01$. Two demographic variables were identified as covariates during correlational analyses, current position and knowledge about NCCN guidelines were significantly related, $r=.2$, $p<.05$. Current position of the nurse ($r=.23$, $p<.05$) and knowledge about NCCN guidelines for cancer treatment related fatigue ($r=-.26$, $p<.01$) were inversely related to exercise barriers beliefs. Current position of the nurse ($r=.21$, $p<.05$) and knowledge about NCCN guidelines for cancer treatment related fatigue ($r=.54$, $p<.01$) were significantly related to exercise counseling behaviors Table 3. These demographic variables were controlled for in multivariate regression analyses.

Table 3 Interco relations of main variables and covariate demographic factors

Variable	1	2	3	4	5	6
Total time spent in exercise	1					
Exercise benefits beliefs	-.03	2				
Exercise barriers beliefs	-.03	-.36**	1			
Exercise Counseling Behaviors	.15	.01	-.31**	1		
Current position	.06	.18	-.23*	.21*	1	
Knowledge about the NCCN Guidelines	-.02	.13	-.26**	.54**	.2*	1

* $p < .05$; ** $p < .01$

Regression analyses

Regression analyses revealed that exercise barriers beliefs was found to be a significant predictor of exercise counseling behaviors, $\beta=-.311$, $p=.001$. Mediation analyses could not be conducted for the main variables, as personal exercise experience did not predict exercise beliefs, nor exercise counseling behaviors. However, as previously noted, current position and knowledge of the NCCN guidelines were significant covariates. Current position (i.e., role) predicted exercise barriers beliefs, $\beta=-.233$, $p=.028$ and exercise counseling behavior, $\beta=.209$, $p=.044$; exercise barriers beliefs completely mediated the relationship between current position and exercise counseling behaviors, $\beta=.134$, $p=.201$ Table 4. Knowledgeable about NCCN guidelines predicted exercise barriers beliefs, $\beta=-.248$, $p=.011$ and

exercise counseling behavior, $\beta=.535$, $p=.000$; and exercise barriers beliefs partially mediated the relationship between knowledge of the NCCN guidelines and exercise counseling behaviors, $\beta=.472$, $p=.000$ Table 5.

Table 4 Mediation model of the relationship of current position and exercise counseling behaviors

Variables	β	Significance	R-Square
MODEL 1 (exercise counseling) current position	.209	.044	.044
MODEL 2 (exercise barriers beliefs) current position	-.233	.028	.054
MODEL 3 current position	.134	.201	.153
Exercise barriers beliefs	-.338	.002	

Table 5 Mediation model of the relationship of knowledge of NCCN guidelines and counseling behaviors

Variables	β	Significance	R-Square
MODEL 1 (exercise counseling) knowledge of NCCN guidelines	.535	.000	.286
MODEL 2 (exercise barriers beliefs) knowledge of NCCN guidelines	-.248	.011	.062
MODEL 3 knowledge of NCCN guidelines	.472	.000	
Exercise barriers beliefs	-.221	.016	

Discussion

In this study 52% of nurses reported that they engaged in exercise counseling behaviors, consistent with studies that revealed that 24 to 50 percent of patients receive counseling for managing cancer treatment related fatigue.^{16,35,36}

This sample of oncology nurses did not exercise at the level recommended by the CDC.³⁰ Personal experience with exercise was not related to the exercise benefits beliefs nor the exercise barriers beliefs of nurses, suggesting that personal experience with exercise may not be an important contextual factor that affects nurses' beliefs in exercise as a treatment for women with breast cancer experiencing CRF. This finding is inconsistent with previous research²⁵ that revealed that nurses' personal experiences were significantly related to their positive beliefs.

The lack of relationship between personal exercise experience and exercise counseling behaviors, was inconsistent with findings reported by Burns et al.³⁷ who found that practitioners' engagement in moderate physical activity was a strong predictor of routine counseling of patients, $\beta=.82$, $p<.05$. Frank et al.²⁴ also noted that medical students who exercised tended to engage in exercise counseling, 1.01, 95% CI [1, 1.01]. For this study, it is plausible that, nurses' level of personal exercise was simply not an important factor that explains their counseling behaviors toward women with breast cancer experiencing CRF. However, there was variability in self-reported exercise behaviors and the outliers that were deleted from the sample may have been due to over-reporting. It is possible that this deletion may be related to the lack of correlation between personal experience with exercise and the other study variables.

At least 80% of the sample agreed or strongly agreed with each item on the exercise benefits belief scale. These findings are consistent with a study by Lee et al.³⁸ who found that 95% of the nurses agreed in the benefits of exercise. However in the current study, nurses' exercise benefit beliefs had no effect on their counseling behaviors, which is inconsistent with empirical evidence supporting this relationship.^{17,19} The lack of variability in the exercise benefits beliefs scores may explain the insignificant relationship between these variables. The significant relationship between exercise barriers beliefs and exercise counseling behaviors is consistent with empirical evidence noted by Hall et al.¹⁷ It is interesting to note that exercise benefits beliefs and exercise barriers beliefs were inversely and significantly related, indicating that they are two distinct and opposite concepts, with exercise barriers beliefs influencing exercise counseling behaviors.

In this study nurses who hold leadership positions tended to be more knowledgeable about NCCN guidelines for CRF, did not perceive many barriers to exercise for women with breast cancer and CRF, and tended to counsel them to exercise. Also, nurses who were knowledgeable about NCCN guidelines for CRF, did not believe that women with breast cancer and CRF have many barriers that prevent them from exercising, and were more likely to counsel them to exercise. It is possible that nurse leaders were more confident with their knowledge of the guidelines and the benefits of exercise to prevent a negative impact of barriers beliefs on their ability to counsel women with breast cancer, thus supporting the influence of roles and affiliations on the multidimensionality of treatment beliefs and illness management behaviors of health care providers as posited in the Commonsense Model.²² Rogers et al.¹⁶ noted that resident physicians' level of confidence in the knowledge of the American College of Sports Medicine guidelines was significantly associated with more frequent self-reported counseling behaviors, $r=.30$, $p=.03$.

Exercise barriers beliefs partially mediated the relationship between knowledge of NCCN guideline for CRF and exercise counseling behaviors and completely mediated the relationship between a nurses' current position and exercise counseling behavior, suggesting that beliefs about barriers to exercise may be an important influence for the degree to which nurses who are knowledgeable about the NCCN guidelines and who function in particular roles counsel women with breast cancer and CRF about exercise. The nurses' knowledge and roles directly influenced their exercise beliefs and these beliefs influenced their counseling behaviors to clients with breast cancer with CRF. There were four factors related to exercise counseling behaviors: Current position, Knowledge about the NCCN guidelines for fatigue, exercise benefits beliefs, and exercise barriers beliefs.

Strengths and limitations

The strengths of this study were the sample size, which was more than adequate for statistical analyses, and the reliable and validated measures for exercise beliefs and exercise counseling behaviors. The major limitation of this study was the sampling frame. Most of the participants were Caucasian, and were all members of the same professional organization. Therefore, the findings may not be generalized to nurses with more diverse backgrounds who work in oncology settings. The Godin Leisure Time Questionnaire was limited in its reliability coefficients for moderate and mild levels of exercise, which were not robust. Self-reporting of personal exercise behavior was another limitation. It is possible that nurses'

engaged in socially desirable responses by inflating their exercise behaviors. It is best to use more objective measures of exercise such as direct observation of exercise, pedometers, or accelerometers, to reduce errors of memory recall and over inflation.^{39,40} This would also eliminate the use of the Godin Leisure Time Questionnaire.

Implications for nursing practice and research

The "Get up and Get moving" campaign of the ONS is geared to motivating nurses and patients to engage in physical activity, and to increase the number of times nurses recommend physical activity to patients receiving treatment for cancer.⁹ In this study, nurses who engaged in physical activity did not necessarily counsel their clients to exercise, therefore it is no guarantee that engaging in exercise will improve this quality measure. As the first study to explore the relationships among oncology nurses' exercise experience, beliefs, and counseling behaviors to women with breast cancer, this study should be replicated obtaining a more diverse sample for generalizability, and using an objective measure of exercise that may be related to exercise beliefs and counseling behaviors. The study also implied that even though nurses believed that exercise is beneficial in combating fatigue they tended not to counsel clients with breast cancer clients and CRF to exercise because they perceived these clients had too many barriers to do so. In order to increase their exercise counseling behaviors, nurses may need to explore and reshape their personal beliefs about exercise barriers. Transformational leaders who provide cognitive empowerment through education to patients about the benefits of exercise, can be used as expert models for staff nurses, as nurse leaders seem to be more knowledgeable about exercise counseling guidelines. This may improve the confidence of staff nurses to explore potential exercise barriers with their patients in order to provide them with resources to overcome these barriers and engage in exercise. The ONS offers a course, Incorporating Physical Activity into Cancer Care, providing skills and resources to help nurses to discuss physical activity with their clients. In-depth qualitative explorations of the exercise treatment beliefs across roles of nurses are also needed to gain a better understanding of commonalities and differences in nurses' exercise barriers beliefs and their effects on their exercise counseling behaviors.

Conclusion

The current study provides important contributions to the existing body of knowledge related to the factors that influence oncology nurses' adherence to exercise counseling guidelines while caring for women with breast cancer. Nurses' exercise counseling behaviors did not meet the national standards of care. Strategies are needed to improve this important quality measure and positively effect the quality of life of women with breast cancer and CRF. This preliminary work suggests that complex relationships exist among nurses' positions, knowledge of national CRF guidelines, treatment beliefs, and exercise counseling behaviors, thus supporting the theorized direct and indirect influence of personal contexts on the illness management behaviors of health care providers.²²

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Conflict of interest

The author declares no conflict of interest.

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