ORIGINAL ARTICLE

Motivation and quality of life in breast cancer survivors: A self-determination theory perspective for physical activity promotion

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ABSTRACT

Despite the well-established benefits of physical activity for breast cancer survivors (BCS), adherence to exercise guidelines remains strikingly low (5–30%), highlighting the urgent need to identify limitations and employ motivational frameworks to increase intervention effectiveness. This cross-sectional study examined the associations among exercise motivation, physical activity levels, quality of life (QoL), and healthy lifestyle behaviours in BCS, using Self-Determination Theory (SDT) as the theoretical foundation. Thirty-five BCS participated, with a mean age of 59.97 ± 10.80 years. The results showed that the highest scores were recorded in identified regulation, social well-being, sleep habits, and dietary habits, while the lowest were found for physical activity participation and additional concerns. Significant correlations emerged among self-determined motivation, basic psychological needs, lifestyle habits, and QoL, providing valuable insights into their interrelationships. These findings highlight the importance of designing and implementing motivational programs that promote adherence to physical exercise and improve the QoL in this population.

Keywords: Self-determinated motivation, Basic psychological needs, Lifestyle habits, Physical exercise.

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INTRODUCTION

Breast cancer survival has improved significantly over time, leading to a considerable increase in the number of breast cancer survivors (BCS) (Bray et al., 2024). This trend is due to substantial advances in both early diagnosis and treatment (Miller et al., 2022). However, despite disease remission, a considerable proportion of BCS sufferers face chronic multi-organ sequelae, which have a multidimensional impact on their quality of life (QoL) (Park et al., 2021; Pimentel-Parra et al., 2025).

BCS can experience extreme fatigue, pain, sleep problems, anxiety, and depression, often clustered in "*symptom clusters*" (affecting 13%) (Abrahams et al., 2018; Bjerkeset et al., 2020). Furthermore, treatments cause physical changes (hair loss, scarring, weight gain) that impact body image and sexuality (Triberti et al., 2019). Faced with the complexity of these challenges, scientific evidence demonstrates the physical and psychological benefits of exercise both during and after treatment for this disease (Kim et al., 2020; Pudkasam et al., 2018). Furthermore, non-medical interventions, especially psychological interventions and exercise, are highly recommended as first-line therapies for cancer-related fatigue, being particularly effective after completing treatment (Abrahams et al., 2018; Kim et al., 2020; Zhang et al., 2025).

Despite the well-known benefits of exercise and healthy diets, few cancer survivors engage in the necessary physical activity recommended by leading medical institutions (Rock et al., 2022). In fact, only 5–30% of patients maintain physical activity during or after treatment (Kim et al., 2020). This is due to multiple barriers, including motivational factors and limitations in functional capacity, as well as physical discomfort and lack of motivation (Cho and Park, 2018; Wurz et al., 2015) . At the individual level, common barriers include physical injuries or symptoms (such as pain and fatigue), lack of time, and lack of motivation. At the societal level, family obligations and lack of support are identified. At the organizational/environmental level, job demands/stress and the cost of healthy food are predominant barriers (Michael et al., 2021).

A recent review on exercise motivation and practice in cancer survivors highlights the need to apply theoretical frameworks to understand cognitive and motivational processes and thus develop effective interventions (Pudkasam et al., 2021). Although the Theory of Planned Behaviour (Ajzen, 1991) and the Social-Cognitive Theory (Bandura, 1986) have been widely used to explain exercise behaviours in cancer survivors, few studies have been based on Self-Determination Theory (Ryan and Deci, 2017). This theory, currently considered one of the most important, postulates that motivation for physical activity depends fundamentally on the satisfaction of three basic psychological needs (BPNs): competence (feeling efficacious), autonomy (being able to choose), and relatedness (social connection) (Ryan and Deci, 2017). When these needs are met, forms of self-determined motivation emerge (such as intrinsic motivation driven by enjoyment or regulation identified by benefit assessment), which are associated with greater exercise adherence and well-being. Conversely, the frustration of these needs leads to less healthy motivations (such as acting out of social pressure or guilt), reducing the benefits. Vallerand's Hierarchical Model (Vallerand, 2007) expands this perspective, proposing that BPN satisfaction generates positive affective, cognitive, and behavioural consequences. However, the application of this framework in the context of SCM is still scarce and limited, with findings suggesting that BPN satisfaction is linked to greater intrinsic motivation and that BPN-based interventions (online or telephone-based) can improve QoL. Research limitations persist, such as the lack of prospective studies and the need for models that integrate more variables for a deeper understanding.

Thus, the aim of this study is to analyse the levels of self-determined motivation (intrinsic regulation, integrated regulation, and identified regulation), satisfaction of BPNs (competence, autonomy, and social

relationships), QoL (physical well-being, social/family well-being, emotional well-being, functional well-being, and additional concerns), healthy lifestyles (sleep habits, eating habits, and physical activity) among BCS. The second aim is to analyse the relationships among these variables to inform and guide future research focused on developing and optimizing effective interventions that foster adherence to physical exercise and healthy lifestyle behaviours, thereby enhancing QoL among BCS.

MATERIAL AND METHODS

Participants

A total of 35 female BCS took part in this cross-sectional study. The participants had a mean age of 59.97 ± 10.80 years. All participants were treated in accordance with the ethical guidelines of the American Psychological Association regarding participant assent, confidentiality, and anonymity. Women agreed to participate in this study by giving written consent.

Procedure

This study was conducted involving the administration of questionnaires to (Leyton et al., 2018) BCS. Two Spanish associations were contacted: the Tierra de Barros Oncology Association, located in Almendralejo, and the Spanish Association Against Cancer (AECC) in Cáceres (Spain). Both associations agreed to facilitate the distribution of questionnaires at their offices, with collection scheduled every 15 to 20 days. Each questionnaire required approximately 10 minutes to complete.

Instruments

The questionnaires used to obtain information related to the study variables are detailed below.

Motivation for physical exercise

To assess motivation for physical exercise based on self-determination theory (Deci and Ryan, 2000), the Behavioural Regulation in Exercise Questionnaire (BREQ-3) (Wilson et al., 2006) was employed. The Spanish version, validated by González-Cutre et al., (2010), evaluates intrinsic regulation, integrated regulation, and identified regulation, among other motivational constructs, in physical activity contexts. The questionnaire consists of 24 items designed to assess the type of motivational regulation related to exercise participation. Participants respond on a Likert scale with 5 response levels, ranging from 0 (completely disagree) to 4 (completely agree). Subsequently, the items are grouped into six factors: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation, underlying the motivational continuum of SDT.

The basic psychological needs

The Basic Psychological Needs Satisfaction Scale (Wilson et al., 2006) was used to measure autonomy, competence, and social relatedness. The Spanish adaptation by Moreno-Murcia et al., (2011) consists of 18 items (six per dimension). Sample items include: competence, autonomy, and social relatedness.

Quality of life

The QoL was assessed using two validated instruments: The FACT questionnaire (Cella et al., 1993) was used, as the general questionnaire, and the FACT-B questionnaire by Brady et al., (1997) which is specific for breast cancer. It consists of 36 items, 26 of which are general and 9 are specific to breast cancer. This is divided into 5 subscales, which are: 7 items for physical well-being, 7 items for social/family well-being, 6 items for emotional well-being, 7 items for functional well-being and a subscale for additional concerns related to both the illness and breast cancer treatment with 9 items.

Healthy lifestyle

To evaluate healthy lifestyle habits related to rest and balanced eating, the Healthy Lifestyle Questionnaire was administered. This instrument was originally validated in a Spanish population (Leyton et al., 2018) and consists of 20 items assessing various health-related behaviours. For the purposes of this study, the five items pertaining to tobacco use were excluded, as they were not relevant to the research objectives. Subsequently, the items are grouped into three factors: rest habits, respect schedules, and balance diet.

Physical activity

The International Physical Activity Questionnaire (IPAQ) short version (Craig et al., 2003), validated in Spanish by Roman-Viñas et al., (2010), was used to evaluate physical activity over the past seven days. The IPAQ classifies activity into three levels (Toloza and Gómez-Conesa, 2007): 1 (low): no physical activity recorded or below the average level, 2 (medium): 3 or more days of vigorous physical activity of at least 20 min per day, 5 or more days of moderate physical activity or walking of at least 30 min, or 5 or more days of any combination of light, moderate or vigorous physical activity, and finally, 3 (high): 3 or more days of vigorous physical activity of more than 30 minutes per day or 7 or more days of any combination of light, moderate or vigorous physical activity. These will be the values established in this work to evaluate the practice of physical activity.

Statistical analysis

The collected questionnaire data were processed using IBM SPSS Statistics 24 (IBM Corp., 2016). Each variable was systematically coded and entered into the statistical software for analysis. Prior to parametric analysis, the assumption of normality was assessed through: Skewness and kurtosis indices, with absolute values below 1.0 indicating acceptable univariate normality (George and Mallery, 2010). Kolmogorov-Smirnov test confirmed a normal distribution ($p > .05$) across key variables. Given these results, parametric statistical methods were applied for subsequent analyses. Descriptive statistics (means, standard deviations, and frequency distributions) were computed to characterize the sample. For the analysis of reliability, the indice of Cronbach's Alpha (α) (equal to or greater than .70) (Nunnally, 1978), was used. Bivariate correlations (Pearson's *r*) were conducted to examine linear relationships between variables. All analyses employed a significance threshold of $p = .05$ (two-tailed).

RESULTS

A descriptive analysis of the questionnaires was performed, including means, standard deviations, and reliability coefficients (Cronbach's Alpha), for all the variables measured in the study (Table 1). The reliability of the questionnaires generally demonstrated good to excellent internal consistency for most scales, with values ranging from .62 to .93. Specifically, the motivation variables consistently demonstrated high mean scores and excellent internal consistency (α >.88) across their subscales.

The correlational analysis (Table 2) revealed significant associations among motivational, psychological, and lifestyle variables. Intrinsic, integrated, and identified regulation styles showed strong positive correlations with one another ($r = .85–.94$, $p < .01$), indicating high coherence within self-determined motivation. All three regulation styles were positively associated with competence ($r = .74–.77$, $p < .01$), autonomy ($r = .67–.75$, $p < .01$), and social relationships ($r = .43–.46$, $p < .05$), supporting the theoretical link between self-determination and psychological need satisfaction.

Functional well-being correlated with competence ($r = .40$, $p < .05$) and physical health ($r = .67$, $p < .01$), but not with emotional or social well-being.

Table 1. Descriptive statistics and reliability analysis of the variables measured through the questionnaires.

Variables	Range	Mean	SD	Cronbach`s Alpha
(M) Intrinsic regulation	1-5	3.90	1.28	*.96*
(M) Integrated regulation	1-5	3.75	1.28	*.93*
(M) Identified regulation	1-5	4.20	1.13	*.92*
(BPNs) Competency	1-5	3.42	1.05	*.90*
(BPNs) Autonomy	1-5	3.82	1.07	*.88*
(BPNs) Social relationships	1-5	3.70	1.01	*.88*
(QoL) Physical	1-5	3.88	1.00	*.81*
(QoL) Social	1-5	4.34	.74	*.86*
(QoL) Emotional	1-5	3.21	1.18	*.62*
(QoL) Functional	1-5	3.90	.97	*.87*
(HLS) Additional preocupations	1-5	2.99	.98	*.72*
(HLS) Rest Habits	1-5	4.00	1.18	*.86*
(HLS) Respect schedules	1-5	4.39	.76	*.75*
(HLS) Balance diet	1-5	4.14	.78	*.65*
IPAQ	1-3	1.71	.82	-

Note: (M) Motivation; (BPNs) Basic psychological needs; (QoL) Quality of life; (HLS) Healthy lifestyle; SD: Standard deviation.

Table 2. Correlational analysis of all motivational, basic psychological needs, quality of life, healthy lifestyle and physical activity variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Intrinsec R.	-														
2. Integrated R.	.94**	-													
3. Identified R.	.85**	.86**	-												
4. Competence	.74**	.77**	.76**	-											
5. Autonomy	.71**	.75**	.67**	.76**	-										
6. Social relationships	.46**	.43*	.45**	.54**	.53**	-									
7. Physical	.09	.09	.07	.10	.08	.05	-								
8. Social	.05	.14	.09	.28	.16	.00	.50	-							
9. Emotional	-.01	-.06	-.14	-.11	.07	-.17	.39	.29	-						
10. Functional	.29	.29	.28	.40*	.24	.01	.67**	.68**	.33	-					
11. Preoccupations	.17	.16	.17	.26	.05	.14	-.52**	-.17	-.44**	-.28	-				
12. Rest	.28	.26	.13	.47**	.28	.06	.10	.36*	.15	.42*	-.01	-			
13. Schedules	.17	.27	.26	.33*	.42*	.26	.16	.28	.13	.15	-.17	-.33	-		
14. Diet	.29	.30	.15	.11	.26	.03	.16	.12	.16	.06	-.15	.10	.65**	-	
15. Physical activity	.14	.14	.29	.16	.16	.19	-.04	-.01	-.00	-.03	.02	.06	.08	-.13	-

*Note. 1-3: Motivational variables; 4-6: Basic psychological needs variables; 7-10: Quality of life variables; 11-4: Healthy lifestyle variables; R. = Regulation; **. The correlation is significant at the 0.01 level. * The correlation is significant at the 0.05 level.*

Preoccupations were negatively associated with physical health (r = −.52, p < .01) and emotional well-being (r = −.44, p < .01), suggesting higher distress aligns with poorer health perceptions. Rest was significantly linked to competence (r = .47, p < .01), functional well-being (r = .42, p < .05), and social well-being (r = .36, p < .05).

Respect for meal schedules correlated with autonomy (r = .42, p < .05) and competence (r = .33, p < .05) and showed a strong positive association with diet quality (r = .65, p < .01).

Physical health and social well-being were unrelated to motivational or lifestyle variables (p > .05), except for their mutual correlation (r = .50, p < .05). Emotional well-being showed no significant associations with motivation or health behaviours.

DISCUSSION

The aim of this study was to analyse the levels of self-determined motivation (intrinsic, integrated, and identified regulation), the satisfaction of BPNs (competence, autonomy, and social relationships), QoL (physical well-being, socio-family well-being, emotional well-being, functional well-being, and additional concerns), as well as healthy lifestyle habits (rest routines, nutrition, and physical activity) in BCS.

Several studies have demonstrated the benefits of engaging in physical activity both during and after a breast cancer diagnosis (Coughlin et al., 2019; Dieli-Conwright et al., 2018; Fernández-Lázaro et al., 2020). Recent research, such as that conducted by Céspedes-Aleixandre (2024), reveals significant improvements across all dimensions of QoL following the implementation of a physical exercise program combined with health education.

In the present study, IPAQ results were found to be low, indicating that the women in the sample engage in limited physical activity. Díaz et al. (2020) confirm that during the recovery period from breast cancer, women tend to make changes in their lifestyle. These changes may be positive—such as adopting healthy eating habits, as observed in this study where nutrition scored the highest average—or negative, such as increased sedentary behaviour or psychosocial challenges. In this case, emotional well-being obtained the lowest average score.

Another important finding is the average score obtained on the Self-Determination Theory (SDT) motivation continuum, where identified regulation stands out. This indicates that the participants engaged in physical activity due to external motivations. In a systematic review, Pérez-Cerezo (2023) highlights key psychological variables associated with physical activity in individuals with cancer, such as high self-esteem and intrinsic motivation. The importance of satisfying the BPNs of autonomy and competence is also emphasized (Price and Brunet, 2022).

The second objective was to analyse the relationship between these variables in order to guide the development and optimization of effective interventions aimed at improving adherence to physical activity and healthy lifestyle habits, thereby enhancing overall QoL and well-being.

In line with the principles of Self-Determination Theory (Ryan and Deci, 2017; Ryan et al., 2021), the most self-determined forms of motivation were positively and significantly associated with the BPNs of competence, autonomy, and social relationships (Viveiros et al., 2025; Zhang et al., 2024). When individuals feel autonomous, competent, and connected, they tend to be more deeply motivated, showing greater commitment and persistence. Beyond intrinsic motivation, a person who exercises because they value its health benefits (identified regulation), or because they have integrated it into their identity (integrated regulation), is likely to feel autonomous, competent, and socially connected.

This relationship not only enhances performance but also contributes to overall well-being. In the present study, positive and significant correlations were found between healthy lifestyle variables—such as rest—and QoL indicators including functional well-being, social well-being, and physical health, all of which were associated with the BPNs of competence. Studies such as that by Majeed et al. (2017), which examined these variables in a population with depression, support these findings. However, in the study by Jang et al. (2023) involving individuals with disabilities, the BPN that was significantly related to QoL variables was autonomy. Renzi et al. (2022) found that the BPNs of relatedness was the key determinant in the adoption of positive QoL indicators and engagement in physical activity as a healthy lifestyle variable among older

adults. These findings suggest that the strength of each BPNs may vary depending on cultural context, type of activity, or individual differences.

In a descriptive study, Mateo-Orcajada et al. (2023) identified positive relationships between BPNs and adherence to the Mediterranean diet and physical activity. Our study corroborates these results, revealing positive and significant correlations between healthy eating habits and the BPNs of competence and autonomy.

No significant relationships were found with the physical activity variable. It is worth noting that recent studies, such as Pérez-Cerezo (2023), identified a significant correlation between physical activity and all three BPNs: autonomy, competence, and relatedness. Furthermore, Fernandes et al. (2023), through structural equation modelling, concluded that higher levels of physical activity are associated with more self-determined dietary regulation, which, in turn, leads to less restrictive eating behaviours influenced by external and emotional factors.

This study presents several limitations that should be considered when interpreting the results. First, due to its descriptive and cross-sectional design, causal relationships between the psychological variables analysed cannot be established. The results reflect the psychological state of the participants at a specific point in time, without accounting for the evolution of these variables over time.

Second, the sample consisted exclusively of women diagnosed with breast cancer who voluntarily agreed to participate, which may introduce selection bias. It is possible that patients with greater psychological resources or a stronger interest in emotional aspects were more willing to participate, thereby limiting the generalizability of the findings to the broader population of women with this disease.

Additionally, certain contextual and clinical factors that could influence the psychological state of the participants such as treatments received, perceived social support, or mental health history, were not considered. The absence of these variables may restrict a more comprehensive understanding of the phenomenon under study.

Future research could address these limitations through longitudinal designs, larger and more representative samples, and the inclusion of additional variables that allow for a more comprehensive understanding of the psychological impact of breast cancer.

Finally, this descriptive study focused on the analysis of psychological variables in women with breast cancer offers insight into the emotional impact of the disease, highlighting psychological needs that are often overlooked in this patient group. It provides an empirical foundation for the development of more effective and personalized psycho-oncological interventions.

CONCLUSION

This study presents a description of variables related to QoL, healthy lifestyle habits, and self-determined motivation in a group of BCS. The results showed that the highest scores were recorded in identified regulation, social well-being, rest habits, and eating habits, while the lowest scores were observed in physical activity and additional concerns. It is recommended that future research develop and implement motivational programs aimed at promoting physical exercise to improve the QoL of BCS.

AUTHOR CONTRIBUTIONS

Ana Ferri Caruana contributed to data collection, manuscript writing, and the preparation of figures and tables. Marta Leyton Román was involved in the literature review, manuscript writing, and interpretation of results. Ruth Jiménez Castuera was responsible for the conceptualization of the study, data collection, statistical analysis, critical revision of the manuscript, and final review of the document prior to submission. Santiago Fresno Alba contributed to data collection, manuscript writing, and the preparation of figures and tables.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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