

Original Article

Quality of Life Determinants among Breast Cancer Women Undergoing Treatment in Indonesia: A Cross-Sectional Study

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ABSTRACT

Objectives: Breast cancer affects millions of women worldwide, including Indonesia and brings a burden on many aspects, especially quality of life. This study investigated the influence of demographic characteristics, psychological distress and physical activity levels on quality of life among breast cancer women undergoing therapy in Indonesia.

Materials and Methods: This cross-sectional study was conducted among 200 breast cancer women. We used the Indonesian version of depression, anxiety, stress scales, international physical activity questionnaires and World Health Organization Quality of Life-BREF to evaluate psychological distress, physical activity levels and quality of life. Descriptive, bivariate and multiple linear regressions were applied.

Results: Study participants had moderate quality of life scores. Approximately 22% of the variance in physical health was explained by family history, depression and physical activity. Having a family history is associated with better psychological health ($\beta = 5.32, P = 0.04$). In contrast, experienced moderate to severe depressive symptoms contributed to lower environment domains ($\beta = -6.30, P = 0.02$). Furthermore, having a low level of physical activity was the only significant factor influencing all domain scores, including physical health ($\beta = -24.82, P < 0.001$), psychological health ($\beta = -19.72, P < 0.001$), social relation ($\beta = -16.91, P < 0.001$) and environment ($\beta = -13.91, P < 0.001$).

Conclusion: Physical activity levels are the strongest determinant of quality of life among breast cancer women in Indonesia. Nurses should not only widen information access regarding breast cancer, especially for patients with genetic risk, but also should early screen for depressive symptoms and develop strategies to motivate patients to increase their physical activity to escalate breast cancer patient's quality of life.

Keywords: Women, Breast cancer, Physical activity, Depression, Quality of life

INTRODUCTION

Breast cancer remains a significant health concern globally, affecting millions of women each year.^[1] Breast cancer is the most prevalent type of cancer in Indonesia, and 18 in 100,000 Indonesian women die due to breast cancer.^[1,2] Non-adherence to treatment guidelines and delaying of receiving initial or adjuvant therapy is more likely to result in a worse survival rate and increased risk of mortality among women with breast cancer.^[3] In Indonesia, about 86% of patients have treatment delays due to either patient or healthcare provider factors such as having a low education level, alternative treatment, physician, diagnosis and treatment system delays.^[4] Thus, motivating patients to adhere to recommended treatments poses a considerable challenge in the Indonesian context.

Breast cancer women experienced a poorer quality of life compared to the general population in Indonesia.^[5] In addition, nearly one-third of breast cancer patients have depression.^[6] Breast cancer survivors, especially those with early-stage cancer or who receive chemotherapy and suffer from treatment-related physical and psychological side effects, were more likely to have poorer quality of life.^[7] Meanwhile, breast cancer women with better performance during treatment are positively associated with greater quality of life.^[8] Identifying the factors influencing quality of life is paramount for enhancing treatment adherence and overall health outcomes among breast cancer patients.

Women living with breast cancer may have dilemmas either to continue their therapy, deal with side effects or prioritise their quality of life.^[9] Shrestha *et al.* (2019) showed that older cancer patients with lower physical function value a better

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quality of life, whereas the younger ones are more likely to have longer life expectancy.^[10] However, a study reported that younger women have lower physical, emotional and social function compared to older women.^[8] Therefore, effective breast cancer management should not only focus on treatment modalities but also encompass interventions to address functional decline across all age groups, thereby promoting overall well-being and longevity.

Maintaining physical activity is another challenge in Indonesia. Approximately 47.8% of Indonesian breast cancer women are physically inactive.^[11] In several previous studies, physical activity adherence managed treatment side effects, lowered risk of mortality and recurrence and improved quality of life.^[12-14] Experiencing greater physical challenges such as fatigue, poor self-image, lack of knowledge and misconception of exercising that causes worse physical function prevents patients from engaging in physical activity.^[15] Therefore, the primary objective of this study was to explore the influence of demographic factors, psychological distress and physical activity levels on quality of life among breast cancer women in Indonesia. The secondary objective was to identify the characteristics of psychological distress, physical activity levels and quality of life levels and to find the strongest determinant to predict breast cancer women's quality of life in Indonesia.

MATERIALS AND METHODS

Design

This cross-sectional study was conducted at Dharmais Cancer Hospital Jakarta, Indonesia, from April to August 2023.

Inclusion criteria

Women aged equal to 20 years or above who had been diagnosed with breast cancer received any cancer therapy (chemotherapy, radiotherapy, surgery or oral cancer medication).

Exclusion criteria

Women who had a history of mental illness were excluded from the study. G-Power 3.0.10 was used to calculate the sample size with the alpha level set at 0.05, with power at 0.95 and with the effect size at 0.05. The minimum sample size was 200 participants.

Ethical considerations

The study protocol and the informed consent form were approved by Dharmais Cancer Hospital Jakarta Review Boards (223/KEPK/VII/2023). Detailed information on the study was explained to the participants. The researcher validated the participants' understanding of the study and their voluntary involvement before securing written informed consent from all eligible participants before the study.

Measures

Eligible breast cancer patients took about 30–45 min to complete the entire self-reported questionnaires described below.

Participants' characteristics

The demographic data of the participants (age, education level, marital status and family history) and their cancer history (cancer stages and therapy types) were collected. The types of therapy were divided into chemotherapy, radiotherapy, a combination of chemotherapy and radiotherapy and others (hormonal therapy). Furthermore, cancer stages were categorised into stages I, II, III or higher.

Depression anxiety stress scale (DASS)

Damanik (2011) translated into the Indonesian version of the DASS from the original Lovibond and Lovibonds' DASS scale (1995) and reported adequate internal reliability for all subscales, including depression, anxiety and stress scales (Cronbach's $\alpha = 0.9053, 0.8517$ and 0.8806 , consecutively).^[16] Participants rated their symptoms for the past 2 weeks on a four-point Likert scale (0 = none, 1 = some of the time, 2 = a good part of the time and 3 = very much or most of the time). Each subscale consists of 14 items, and the score range was 0–42, with a higher score indicating higher severity of depression, anxiety and stress symptoms.^[16]

Physical activity levels

The Indonesian version of the self-reported international physical activity questionnaire was used to collect the levels of physical activity in this study.^[17] By answering seven questions, participants reported their physical activities in the past 7 days that lasted at least 10 min, for example, walking (Metabolic Equivalent Task [MET] level = 3.3), moderate ([MET] level = 4.0) and vigorous ([MET] level = 8.0) activities and time spent sitting. The intensity of total physical activity was expressed in MET-min per week (MET level \times minutes of activity \times times per week). Finally, physical activity levels were categorised into low physical activity (<600 MET-min/week), moderate physical activity (at least 600 MET-min/week) and high physical activity (3 days vigorous activity with 1500 MET-min/week or combination walking, moderate and vigorous activity with at least 3000 MET-min/week). The seven questions of this questionnaire are found to be valid (the Kaiser-Meyer-Olkin test = 0.910 and Bartlett's Test of Sphericity = 573, 434 [pdf = 28, $P < 0.001$]) and reliable (Cronbach $\alpha = 0.884$).^[17]

World Health organization quality of life (WHOQOL-BREF)

Quality of life was collected using the Indonesian version of the self-reported WHOQOL-BREF questionnaire, which consists of four domains such as physical health aspect

(7 items), psychological aspect (6 items), social relationships (3 items) and environment aspect (8 items).^[18] WHOQOL-BREF has been previously utilised among breast cancer patients in Indonesia.^[5] The good internal consistency of the WHOQOL BREF's domains was reported in this study for physical health (Cronbach $\alpha = 0.75$), psychological health (Cronbach $\alpha = 0.78$), social relation (Cronbach $\alpha = 0.77$) and environment (Cronbach $\alpha = 0.75$). Each item is rated using a 5-point Likert scale with varied wording on each scale (for example, 1 = very dissatisfied/very bad/not at all to 5 = very satisfied/very good/in extreme amount). We used a converting table to convert the raw score (total Likert scale in one domain) to the transformed score for each domain.^[19] The transformed scores range from 0 to 100, and a higher score indicates a greater quality of life.^[18] For example, if the raw score of physical health is 21, then the transformed score will be 50, according to the converting table.^[19]

Statistical analysis

IBM Statistical Package for the Social Sciences (SPSS) 21.0 (SPSS, Chicago, IL, USA) was applied to evaluate the collected dataset. This study used descriptive analysis (frequency, percentage, mean and standard deviation [SD]) for participants' and cancer characteristics as well as depression, anxiety, stress and the level of physical activity. To compare the quality of life scores among the various groups, we run bivariate analyses, including an independent *t*-test and one-way analysis of variance. Pearson's correlations were used to find the associations between continuous variables and the dependent variables. Statistical significant determinants from the above statistics were then entered into a multiple linear regression to determine the significant factors associated with quality of life domains including physical health, psychological health, social relations and environment.

RESULTS

Participants and cancer's characteristics

In total, 200 women with breast cancer participated in this study. Table 1 presents the background information on the demographics and cancer history of the participants. The mean age of the participants was 50.49 (SD = 10.96) years. The majority of the participants completed a secondary level of education (37.5%), stayed as housewives (75.5%), were married (76%) and had no family history of cancer (75.5%). All of the participants received cancer treatment, and most of them received chemotherapy (65%) and had been diagnosed with cancer stage III or higher (48.5%).

In addition, participants also experienced moderate to severe depressive symptoms, anxiety and stress (19%, 23% and 19%, respectively). Half of the participants engaged in moderate level of physical activity (52.5%) and had slightly above the moderate score of quality of life in physical

Table 1: Participants and cancer characteristics.

Variables	n (%)	Mean±SD
Age		50.49±10.96
Education levels		
Primary	68 (34)	
Secondary	75 (37.5)	
Tertiary	57 (28.5)	
Occupations		
Work	49 (24.5)	
Housewives	151 (75.5)	
Marital status		
Married	152 (76)	
Widow/single	48 (24)	
Family history		
Yes	49 (24.5)	
No	151 (75.5)	
Cancer stages		
I	12 (6)	
II	82 (41)	
III or higher	106 (53)	
Therapy		
Chemotherapy	102 (51)	
Radiotherapy	11 (5.5)	
Both	28 (14)	
Others	59 (29.5)	
Depression		
Normal to slight	172 (86)	
Moderate to severe	28 (19)	
Anxiety		
Normal to slight	154 (77)	
Moderate to severe	46 (23)	
Stress		
Normal to slight	162 (81)	
Moderate to severe	38 (19)	
Physical activity		
Low activity	30 (15)	
Moderate activity	105 (52.5)	
High activity	64 (32)	
Quality of life domains		
Physical health		57.28±18.47
Psychological health		63.69±17.43
Social relations		62.77±18.24
Environment		69.97±14.56
Descriptive analysis, n: Frequency, %: Percentage, SD: Standard deviation		

health (mean = 57.28, SD = 18.47), psychological health (mean = 63.69, SD = 17.43), social relations (mean = 62.77, SD = 18.24) and environment (mean = 69.97, SD = 14.56).

Determinants contributed to quality of life domains

Table 2 shows the bivariate analysis between participants and cancer characteristics and quality of life domains. Participants with a family history of cancer had higher scores in physical health, psychological health and social relation ($t = 2.09$, $P = 0.03$; $t = 2.32$, $P = 0.02$ and $t = 1.99$,

Table 2: Factors associated with quality of life domains.

Variables	Quality of life domains							
	Physical health		Psychological health		Social relations		Environment	
	Mean±SD	P	Mean±SD	P	Mean±SD	P	Mean±SD	P
Education levels ¹								
Primary	57.66±18.71	0.79	62.85±17.83	0.84	65.47±16.49	0.15	68.92±14.48	0.71
Secondary	56.17±18.43		59.66±17.72		59.66±17.72		70.06±14.08	
Tertiary	58.29±18.49		63.64±17.43		63.64±20.47		71.08±14.56	
Occupations ²								
Work	55.79±18.01	0.51	63.73±18.19	0.98	63.18±20.95	0.85	69.89±14.85	0.96
Housewives	57.76±18.65		63.68±17.24		62.64±17.34		69.99±14.51	
Marital status								
Married	57.51±18.16	0.75	64.41±17.0	0.30	63.14±15.04	0.61	69.96±14.45	0.98
Widow/Single	56.54±18.16		61.41±18.74		61.60±19.54		70.00±15.04	
Family history ²								
Yes	62.04±19.31	0.03*	68.67±19.07	0.02*	67.26±20.93	0.04*	73.36±16.40	0.06
No	55.74±17.99		62.07±16.61		61.31±17.10		68.86±13.79	
Cancer stages ¹								
I	57.60±18.02	0.88	61.50±16.56	0.89	64.08±17.64	0.90	72.50±13.34	0.77
II	54.83±14.29		64.06±19.13		63.23±18.92		69.36±15.02	
III or higher	57.60±18.02		63.66±18.02		62.27±17.92		70.15±14.42	
Therapy ¹								
Chemotherapy	56.48±17.90	0.78	62.92±17.91	0.87	62.51±17.56	0.39	69.54±13.86	0.70
Radiotherapy	59.81±21.64		62.63±19.42		56.27±21.31		68.72±15.31	
Both	55.71±9.68		65.78±16.57		60.75±19.73		68.28±14.57	
Others	58.94±18.58		64.23±16.94		65.38±18.11		71.72±15.76	
Depression ¹								
Normal to slight	58.07±18.41	0.13	64.06±17.86	0.13	62.91±18.75	0.79	70.88±14.39	0.02*
Moderate to severe	52.42±18.44		61.42±14.55		61.92±15.00		64.35±14.56	
Anxiety ¹								
Normal to slight	58.16±18.24	0.22	64.60±17.08	0.17	63.20±8.01	0.54	69.93±13.96	0.95
Moderate to severe	54.34±19.12		60.65±18.43		61.32±19.13		70.08±16.57	
Stress ¹								
Normal to slight	57.65±18.49	0.56	64.11±17.79	0.48	62.52±14.09	0.59	70.54±14.09	0.25
Moderate to severe	55.73±18.54		61.89±15.91		64.18±16.06		67.52±16.39	
Physical activity ¹								
Low activity	41.83±14.26	<0.001**	52.60±14.78	<0.001**	53.00±13.32	<0.001**	61.73±11.83	<0.001**
Moderate activity	55.36±17.27		61.04±16.35		60.85±17.54		68.36±13.87	
High activity	67.98±15.80		73.64±15.37		70.70±18.53		76.78±14.04	

¹One-way analysis of variance (ANOVA), Independent t-test analysis², SD: Standard deviation., ** $P < 0.01$ (two-tailed), * $P < 0.05$ (two-tailed)

$P = 0.04$, consecutively). Highly active participants were more likely to have greater scores in all quality of life domains ($F = 27.67$, $P < 0.001$; $F = 21.48$, $P < 0.001$; $F = 14.15$, $P < 0.001$ and $F = 24.21$, $P < 0.001$, respectively). In contrast, depression was negatively associated with the environment ($t = -2.21$, $P = 0.02$).

Table 3 provides the multiple linear regression results on factors contributed to quality of life domains. Approximately 22% of the variance in physical health was explained by family history, depression and physical activity. Having a family history positively contributed to psychological health ($\beta = 5.32$, $P = 0.04$). In contrast, experiences of moderate to severe depressive symptoms negatively influenced environment domains ($\beta = -6.30$, $P = 0.02$). Furthermore,

having a low level of physical activity was the only significant factor that contributed to the lower score of physical health ($\beta = -24.82$, $P < 0.001$), psychological health ($\beta = -19.72$, $P < 0.001$), social relation ($\beta = -16.91$, $P < 0.001$) and environment ($\beta = -13.91$, $P < 0.001$).

DISCUSSION

This study reported that Indonesian women with breast cancer under therapy have a moderate level of quality of life in all functioning scales, including physical health (mean = 57.28, SD = 18.47), psychological health (mean = 63.69, SD = 17.43), social relations (mean=62.77, SD = 18.24) and environment (mean = 69.97, SD = 14.56) which were lower than breast cancer patients in Thailand.^[20]

Table 3: Regression analysis of the patient's characteristics and their quality of life.

Variables	Physical health ($r^2=0.22$)		Psychological health ($r^2=0.17$)		Social relations ($r^2=0.10$)		Environment ($r^2=0.13$)	
	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>	β	<i>P</i>
Having family history	4.84	0.07	5.32	0.04*	4.90	0.08	3.64	0.10
Moderate to severe depression	-5.18	0.12	-2.34	0.47	-0.71	0.83	-6.30	0.02*
Low activity	-25.09	<0.001**	-19.93	<0.001**	-16.91	<0.001**	-14.12	<0.001**
Moderate activity	-11.87	<0.001**	-11.71	<0.001**	-9.21	<0.001**	-7.80	<0.001**

Multiple linear regression, r^2 : Adjusted R squared, ** $P<0.01$ (two-tailed), * $P<0.05$ (two-tailed)

Indonesian breast cancer patients experienced depression stigma and felt shame for having this disease, so they preferred to cure the symptoms through traditional therapy. As such, most of them visited health-care facilities for advanced cancer and poor conditions.^[21-23] Indicating the importance of strategies to increase patients' health literacy and prevent treatment delays for optimal well-being.

Nearly one in every four participants in this study had a family history of cancer and was more likely to have better psychological health, which is consistent with a previous study in Jakarta.^[24] Moreover, patients who perceived greater depressive symptoms tend to have poorer environmental scores, which is consistent with a review study conducted in less green areas and dense areas.^[25] Patients with a family history tend to have a higher awareness of breast cancer, and they are more likely to practice the screening methods, which are consistent with a study conducted in Addis Ababa, Ethiopia.^[26] A family history of having breast illness perhaps provides patients with an opportunity to gain information and improve their seeking behaviour. A previous study in Ghana supported that wider access to health information and literacy reduced depression and anxiety, then indirectly improved the quality of life among women living with breast cancer.^[27]

In addition, participants of our study experienced moderate to severe depressive symptoms, anxiety and stress (19%, 23% and 19%, respectively). This prevalence is higher than Setyowibowo *et al.*'s (2018) study, which revealed the prevalence of moderate to severe anxiety or depression ranged from 11.4 to 15.9% among breast cancer patients in Bandung.^[5] Living in high-density neighbourhoods was negatively associated with poorer quality of life.^[28] Moreover, the high-density area produces a lower opportunity to engage in recreational activity, and a study conducted by Orstad *et al.* (2018) and Lim showed that perceiving a better neighbourhood environment improves people's participation in recreational physical activity such as walking, which facilitates lowering depressive symptoms.^[28,29] It suggests that developing infrastructures to build a better environment is crucial to promoting psychological health and quality of life in Indonesia, especially in Jakarta.

This study revealed that physical activity was the most significant determinant contributing to aspects of quality of

life domains while controlling for other variables, which is supported by a study done in Korea.^[12] Breast cancer survivors with high physical activity were significantly associated with relieved physical symptoms, including fatigue, pain, sleep disturbance, upset by hair loss, cognitive impairment and depression, as well as sexual function, than patients with low physical activity.^[12,30,31] Many types of exercise were reported as safe and fruitful activities for breast cancer patient's quality of life, such as aerobics, yoga, walking and water exercise.^[30,32,33] After a 12-month exercise intervention, breast cancer patients who performed 2 km walking and attained better physical activity to 5-year follow-up tend to achieve higher global quality of life scores, physical, social and role functioning and low fatigue.^[32] Indicating these findings suggest the long-term effect of physical activity adherence on the prolonged effect of health deterioration and breast cancer-related side effects.

Approximately 15% of our study participants engaged in low physical activity. Decreasing the total physical activity level had been observed 2 years after post-operative breast cancer compared to pre-operative values.^[34] Patients' misconceptions regarding physical activity affecting physical deterioration, pain, fatigue, lack of confidence, time and knowledge were reported to be a challenge for nurses to motivate patients to participate in physical activity.^[15,35] Nurses may consider several behavioural change theories to develop strategies to motivate patients and improve patients' knowledge and literacy to enhance physical activity adherence and quality of life.^[35]

Strength of the study

Many determinants influence good quality of life among Indonesian women with breast cancer. The strengths of this study are that we add physical activity levels and investigate their contribution while considering patients' demography and depression. In addition, this study was conducted by Indonesian researchers, which helped us to better understand current breast cancer care and cultural influences as well as to create strategies to improve patients' quality of life.

Limitations of the study

The participants were recruited from only a single area, Jakarta which limited the findings' generalizability. Finally,

this study was a cross-sectional study that was not able to explain the causal-effect relationship.

Recommendations for clinical practice and future research

The findings of the study did highlight the need for healthcare providers to be aware of and assess patients' psychosocial conditions. Thus, the healthcare profession should be able to enhance breast cancer women's quality of life by motivating patients to engage in physical activity, facilitating depressive symptoms and broadening information access regarding breast cancer, especially for patients with family histories. Qualitative studies should be conducted to explore further the meaning of having breast cancer, difficulties in treatment adherence and managing side effects and strategies used to embrace these challenges from patients' perspectives.

CONCLUSION

Breast cancer patients in Jakarta, Indonesia, experienced moderate quality of life, highlighting the need for interventions to enhance their well-being. Family history, depression and physical activity levels significantly influence quality of life outcomes. Healthcare providers should prioritise health literacy, screen for depressive symptoms and promote physical activity to improve patients' quality of life and treatment adherence.

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We thank the hospital for providing the data.

Ethical approval

The research/study was approved by the Institutional Review Board at Dharmas Cancer Hospital Jakarta Review Boards, number 223/KEPK/VII/2023, dated 14 July 2023.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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