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Illness Perception and Quality of Life among Women with Breast Cancer: A Multivariate Analysis from Indonesia

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Abstract

Breast cancer profoundly affects patients' quality of life (QoL), yet the relative impact of illness perception compared to demographic factors remains underexplored. This study sought to identify key determinants of QoL using a comprehensive multivariate approach, aiming to examine how illness perception influences the QoL of patients with breast cancer in Indonesia. A cross-sectional study was conducted, involving 167 patients with breast cancer from the hospital's cancer unit who were selected by purposive sampling. Demographic data, illness perception, and QoL were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Measurement models assessed reliability (Cronbach's α, CR) and validity (AVE), while structural models evaluated path coefficients (β) and predictive power (R^2) using SmartPLS 4.0. Research results showed illness perception emerged as a strong predictor of QoL (β = -0.558, $p < 0.001$; $R^2 = 0.360$), with emotional response (loading = 0.796) and perceived consequences (loading = 0.727) identified as key dimensions. Demographic variables showed negligible influence ($R^2 = 0.0003$). Reliability was acceptable for illness perception (α = 0.699, CR = 0.794) but poor for demographic factors (α = 0.248). Model fit indices suggested moderate adequacy (SRMR = 0.104, NFI = 0.515). Illness perception, especially emotional response and perceived consequences, strongly determines QoL. Psychological interventions, education, and emotional support should be prioritized over demographic factors in breast cancer care.
Keywords: breast neoplasms, quality of life, illness perception, structural equation modeling, cognitive behavioral therapy

Persepsi Penyakit dan Kualitas Hidup di Kalangan Wanita dengan Kanker Payudara: Analisis Multivariat dari Indonesia

Abstrak

Kanker payudara berdampak besar terhadap kualitas hidup, namun pengaruh relatif persepsi penyakit terhadap demografi masih kurang dipelajari. Penelitian ini bertujuan untuk mengidentifikasi determinan utama kualitas hidup menggunakan pendekatan multivariat, menganalisis persepsi penyakit mempengaruhi kualitas hidup pada pasien kanker payudara di Indonesia. Sebuah studi potong lintang dilakukan terhadap 167 pasien kanker payudara dari unit kanker rumah sakit yang dipilih dengan purposive sampling. Data demografi, persepsi penyakit, dan QoL dianalisis dengan Partial Least Squares Structural Equation Modeling *(PLS-SEM). Model pengukuran menilai reliabilitas (α Cronbach, CR) dan validitas (AVE) sementara model struktural menguji koefisien jalur (β) dan daya prediktif (R^2) menggunakan SmartPLS 4.0. Hasil penelitian menunjukkan persepsi penyakit secara kuat memprediksi kualitas hidup (β = -0,558; $p < 0,001$; $R^2 = 0,360$), dengan emosi (loading = 0,796) dan konsekuensi (0,727) sebagai dimensi utama. Demografi menunjukkan efek yang dapat diabaikan ($R^2 = 0,0003$). Model ini memiliki reliabilitas yang dapat diterima untuk persepsi penyakit (α = 0,699, CR = 0,794) tetapi kurang sesuai untuk demografi (α = 0,248). Indeks kesesuaian menunjukkan keselarasan sedang (SRMR = 0,104, NFI = 0,515). Persepsi penyakit, terutama aspek emosi dan konsekuensi, menjadi penentu utama kualitas hidup. Intervensi psikologis, edukasi, dan dukungan emosional perlu diprioritaskan dibanding karakteristik demografi dalam perawatan kanker payudara.*
Kata Kunci: *neoplasma payudara, kualitas hidup, persepsi penyakit, pemodelan persamaan struktural; terapi perilaku kognitif*

Introduction

Breast cancer remains one of the most significant global health challenges of our time. As the most commonly diagnosed cancer worldwide, it accounts for 11.7% of all cancer cases and stands as the fifth leading cause of cancer mortality globally (Bray et al., 2018; Soerjomataram & Bray, 2021). The disease's impact is particularly severe in developing nations like Indonesia, where healthcare resources are often limited and late-stage diagnoses are common. Recent data from the Indonesian Ministry of Health reveals a troubling upward trend, with cancer prevalence increasing from 1.4 to 1.49 per 1,000 population between 2013 and 2018 (Ministry of Health Republic Indonesia, 2019). These statistics underscore the urgent need for comprehensive, evidence-based approaches to address the multifaceted challenges posed by breast cancer in the Indonesian context.

The impact of breast cancer extends well beyond physical health, profoundly affecting patients' quality of life (QoL) across several dimensions. Physical challenges, such as chronic pain, treatment-related fatigue, and mobility restrictions, significantly interfere with daily activities (Butler et al., 2023; Smolarz et al., 2022). On a psychological level, patients frequently grapple with anxiety, depression, and persistent fears of recurrence.(Butler et al., 2023) Socially, the disease can impose significant financial burdens, including treatment expenses and lost income. Moreover, alterations in physical appearance and decreased energy levels often lead to social withdrawal and difficulties in maintaining relationships (Zhu et al., 2023). From a spiritual perspective, many patients confront existential questions, a sense of lost purpose, and feelings of guilt or divine punishment (I. Dewi, Gartika, et al., 2023). This overall decline in QoL underscores the critical need for holistic interventions that address every facet of patient well-being (I. Dewi, Widianti, et al., 2023).

Understanding and improving the quality of life (QoL) in breast cancer patients hinges on illness perception, which is the way patients cognitively and emotionally interpret their disease (Tok Yıldız, 2024). According to Leventhal's Self-Regulation Model, illness perception encompasses several key components: identity, timeline, consequences, personal control, beliefs, treatment control, coherence, and emotional representation. Positive views, linked to perceived control and fewer negative consequences, lead to better treatment adherence and coping. Conversely, negative views often result in greater psychological distress and poorer health outcomes (Fernandes & McIntyre, 2020; Hosseini et al., 2025; Saranjam et al., 2023).

Previous studies have demonstrated that illness perception plays a central role in the psychological adjustment of women with breast cancer. A recent mixed-method study in Türkiye reported that patients commonly interpret breast cancer as a chronic and threatening condition associated with negative consequences, altered body image, emotional distress, and disruptions in family and social roles(Tok Yıldız, 2024). However, this study was primarily descriptive and did not quantitatively assess the predictive impact of illness perception on quality of life (QoL). In contrast, research from Poland by Ośmiałowska et al., (2022) confirmed that illness perception correlates with QoL, yet their analysis focused largely on acceptance, optimism, and coping strategies without examining whether illness perception exerts a stronger influence on QoL than demographic or clinical variables.

Further evidence derived from the self-regulation framework suggests that cognitive and emotional representations of illness are key determinants of coping patterns among women with breast cancer. (Fernandes & McIntyre, (2020) emphasized that illness representations significantly shape coping behaviors; however, their study did not extend these associations to QoL outcomes, nor did it employ multivariate modeling to evaluate the relative contribution of each illness perception dimension. Similarly, research examining illness perception and QoL among breast cancer patients (Ośmiałowska et al., 2022) has largely reported correlational findings without comparing the explanatory power of illness perception against socio-demographic characteristics.

Moreover, the existing body of literature is dominated by studies conducted in non-Asian contexts, such as Poland, Portugal, and Türkiye settings with socio-cultural values that differ markedly from those in Indonesia. Given that cultural norms, religious beliefs, and collectivistic family structures can profoundly influence emotional responses, illness beliefs, and coping

strategies, the applicability of these findings to Indonesian breast cancer patients remains limited. Importantly, none of the previous studies has evaluated illness perception as a latent construct using multivariate approaches such as partial least squares structural equation modeling (PLS-SEM). Consequently, it remains unclear which dimensions of illness perception, such as emotional representation or perceived consequences, are the strongest predictors of QoL.

Taken together, these gaps underscore the need for a contextually grounded, multivariate investigation that examines the predictive strength of illness perception relative to demographic factors among Indonesian women with breast cancer. The present study addresses these gaps by providing comprehensive empirical evidence on how multidimensional illness perception shapes QoL within this understudied population. This study employs a quantitative, multivariate approach to analyze the perception of illness affecting quality of life (QoL) in breast cancer patients in Indonesia. While prior studies explored this relationship, few used advanced statistical models to examine the complex interactions with social and spiritual factors. Grounded in the biopsychosocial-spiritual framework and the Common-Sense Model, (Fernandes & McIntyre, 2020; Hagger & Orbell, 2022) this research investigates the roles of illness perception, social support, and spiritual well-being. By testing these models in a predominantly Muslim, collectivist context, the study offers valuable insights for developing culturally sensitive interventions and enhancing holistic care in resource-limited healthcare settings.

Method

The research employed an observational, quantitative study design with a cross-sectional approach. The study focused on women diagnosed with breast cancer at a general hospital in Indonesia. A purposive sampling technique was used to select participants. A total of 167 breast cancer patients were analyzed, which exceeds the PLS-SEM threshold of 70, as per the 10x rule, and achieved a power greater than 99% for detecting significant effects. This robust sample size enables the reliable identification of relationships, even for smaller effects, and conforms to established methodological guidelines.(Hair et al., 2022)

Inclusion criteria for this study were: women aged 18–65 years with a confirmed diagnosis of stage I–IV breast cancer; currently undergoing or having completed cancer therapy (chemotherapy, radiotherapy, or hormonal treatment) within at least the past month; and able to communicate in Indonesian. Exclusion criteria included patients with severe comorbidities known to significantly impact quality of life (e.g., chronic renal failure, severe stroke), those with diagnosed cognitive impairments (e.g., dementia), and individuals who declined to participate. Eligible participants were identified with the assistance of oncologists and nurses. Researchers then approached these individuals, provided a clear explanation of the study's purpose, and obtained written informed consent. Participants completed the questionnaires either independently or with the assistance of a trained interviewer in cases of low literacy.

The demographic questionnaire collects information on age, disease stage, illness duration, income, religion, and educational level. Illness perception is evaluated using the Revised Illness Perception Questionnaire (IPQ-R),(Moss-Morris et al., 2002) which encompasses several dimensions: timeline, consequences, personal control, treatment control, illness coherence, emotional representation, and causal beliefs. This instrument has a Cronbach's Alpha of 0.82. Responses are recorded on a Likert scale from 1 to 5, where one represents "strongly disagree," and five signifies "strongly agree." Higher scores in timeline, consequences, and emotional representation indicate negative perceptions of the illness, whereas elevated scores in personal control, treatment control, and illness coherence suggest more adaptive perceptions. The mean scores for each subscale are calculated accordingly.

The quality of life was evaluated using the Indonesian Breast Cancer Health Related Quality of Life (INA-BCHRQoL),(Saptaningsih et al., 2018) which encompasses physical, psychological, social, and spiritual dimensions, with a validity coefficient of 0.82. Scores are determined using a 5-point Likert scale (1 = "Never or Very Poor" to 5 ="Always/Very Good") and are converted to a 0–100 scale, where higher scores signify better quality of life (QoL).

The global QoL score is the average of all domain scores, interpreted as follows: a score below 50 indicates poor health-related quality of life (HRQoL), scores from 50 to 70 indicate

moderate HRQoL, and scores above 70 indicate good HRQoL. The internal consistency, assessed by Cronbach's alpha, ranges from 0.82 to 0.91.(I. Dewi, Gartika, et al., 2023)

Data were collected from 167 breast cancer patients at the Hospital in Bandung district, West Java, Indonesia, using a cross-sectional design. Validated questionnaires, IPQ-R (Illness Perception), and INA-BCHRQoL (culturally adapted QoL), were administered in Bahasa Indonesia after rigorous translation and back-translation. Trained nurses conducted interviews in private clinic rooms post-consultation, ensuring confidentiality. For participants with limited literacy, items were read aloud verbatim without interpretation to prevent bias. The Quality control measures included real-time checks for missing responses, random audits (10% of forms) to verify consistency, and double data entry in SPSS to minimize errors.

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), a multivariate statistical technique well-suited for examining complex relationships between latent constructs in predictive research.(Hair et al., 2022) PLS-SEM was chosen due to its ability to handle smaller sample sizes, non-normal data distributions, and exploratory model structures, which are common characteristics in healthcare behavioral studies. The analysis followed a two-step approach:

Internal consistency was evaluated using Cronbach's alpha (α) and composite reliability (CR), both of which were expected to meet or exceed the threshold of 0.70 to ensure acceptable internal coherence of items within each construct. This threshold is widely accepted in psychometric research as the point where measurement error is considered low and item correlations sufficiently high to justify construct validity.(Hair et al., 2022) Convergent validity was assessed using the Average Variance Extracted (AVE), where a minimum value of 0.50 indicates that more than 50% of the variance in observed variables is explained by the latent construct, reflecting a satisfactory level of shared variance.

Structural Model Assessment. Path coefficients (β) were examined to test hypothesized relationships, with significance determined via bootstrapping (5,000 subsamples). Effect sizes (f^2) were calculated to assess practical relevance (small: 0.02; medium: 0.15; large: 0.35).(J. Cohen, 1992; L. Cohen et al., 2018) Predictive relevance (Q^2) was evaluated using the blindfolding procedure, where $Q^2 > 0$ suggested model relevance.(Hair et al., 2022) Model fit was checked via standardized root mean square residual (SRMR < 0.08) and normed fit index (NFI > 0.90) (Hu & Bentler, 1999).

This study received ethical approval from the Health Research Ethics Committee of Universitas 'Aisyiyah Bandung, Indonesia, with approval number: 737/KEP. 01/UNISA-BANDUNG/II/2024. Written informed consent was obtained from all participants, including thumbprint signatures for illiterate patients. Confidentiality was maintained through anonymous coding and secure data storage. Trained interviewers provided emotional support and made referrals when needed.

Participants received a gift without any incentives influencing their decision to participate. All procedures adhered to the Declaration of Helsinki and Indonesian health research regulations. The data were encrypted and accessible only to the research team, while paper records were stored in locked facilities. These measures were implemented to protect participant rights and ensure the integrity of the research.

Results

The study involved 167 breast cancer patients, primarily adults aged 30 to 59 years (75.6%). Most participants were in stage II of the disease (39.3%), identified as low-income (66.1% earning less than IDR 3.5M), were predominantly Muslim (98.8%), and had completed high school (36.3%). A significant portion of the patients reported having an illness duration of 1-2 years (43.5%), as shown in Table 1.

Table 1. Distribution frequency and demographic data of participants

Demographics of participants	f	%
Age		
young adults (20-29 years old)	9	5
adults (30-59 years old)	127	76
elderly (>=60 years old)	31	18
Stage of disease		
I	38	23
II	66	39
III	58	35
IV	5	3

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Demographics of participants	f	%
Length of illness		
<1 year	54	32
>1 to 2 years	73	43
>2 years	40	24
Income*		
<IDR 3,508,677	111	66
=IDR 3,508,677	44	26
>IDR 3,508,677	12	7
Religion		
Islam	166	99
Christian	1	1
Education		
Elementary school	45	27
Junior high school/equivalent	36	21
High school/equivalent	61	36
College/ equivalent	25	15

N=167 *income based on the West Java Regional Minimum Wage

Table 2 presents findings regarding the reliability of the demographic data, which proved to be unreliable. The Cronbach's Alpha value was 0.248, and the Average Variance Extracted (AVE) was 0.219. These findings indicate weak internal consistency, suggesting that the demographic variables do not represent a coherent latent construct. In contrast, the Illness Perception construct exhibited acceptable reliability, with a Cronbach's Alpha of 0.699 and an AVE of 0.367. Although the AVE is slightly below the ideal threshold of 0.5, the construct is still considered marginally valid. Quality of Life (QoL) demonstrated perfect reliability with a Cronbach's Alpha value of 1, likely due to its assessment using a single indicator.

Table 2. Construct Reliability and Validity

Construct	Cronbach's Alpha	rho_A	Composite Reliability (CR)*	Average Variance Extracted (AVE)**
Demographic	0,248	0,330	0,440	0,219
Quality of Life	1,000	1,000	1,000	1,000
illness perception	0,699	0,744	0,794	0,367

*CR indicates acceptable reliability if ≥ 0,7
**Average Variance Extracted (AVE) (acceptable if ≥ 0,5

Table 3. Path Coefficients and Effect Size

Relationship	β	f^2	Interpretation
Demographic and QoL	-0,211	0,070	Small negative effect
Illness Perception and QoL	-0,558*	0,487	Large negative effect
Demographic and illness perception	0,017	0,0003	Negligible effect

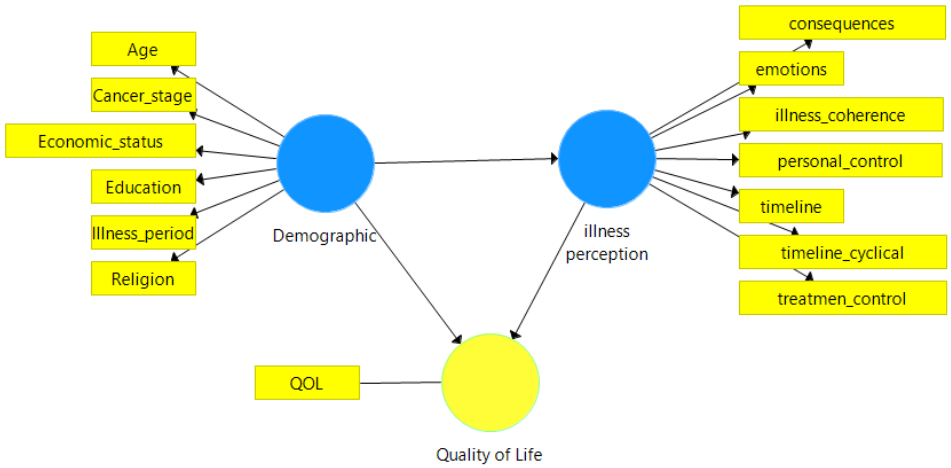

Figure 1. Structural Equation Model (SEM)-PLS illustrating the relationships between demographic factors, illness perception, and quality of life (QOL)

Table 4. Cross-Loadings of Key Indicators

Indicators	Demographics	QoL	Illness Perception
Economic status	**0,775**	-0,165	0,006
Cancer stages	**0,592**	-0,157	0,046
Emotions	0,010	-0,471	**0,796**
Consequences	0,044	-0,400	**0,727**
Personal control	0,043	-0,377	**0,651**
QoL	-0,221	1,000	-0,562

Bold values indicate primary loadings (> 0,7 ideal for convergent validity)

Table 5. Model Fit Indicates

Index	Value	Threshold	Interpretation
SRMR	0,104	< 0,08	Acceptable misfit
NFI	0,515	≥ 0,90	Poor fit
Chi-Square	197,27	-	Used for relative fit

SRMR=standardized Root Mean Square Residual
NFI=Normal Fit Index

Table 6. Predictive Power (R^2)

Variables	R^2	Adjusted R^2	Interpretation
Quality of Life (QoL)	0,360	0,353	Moderate explanation
Illness perception	0,0003	-0,006	Negligible explanation

Table 3 highlights strong loadings for `emotions` (0.796), `consequences` (0.727), and `personal control` (0.651), underscoring their importance. The weak cross-loading of `emotions` on quality of life (QoL) (-0.471) indicates that these constructs are distinct. Among demographic factors, `economic status` (0.775) and `cancer stage` (0.592) emerge as the most significant indicators, with minimal cross-loadings reinforcing their discriminant validity.

The diagram in Figure 1 represents a Structural Equation Model (SEM)-PLS illustrating the relationships between demographic factors, illness perception, and quality of life (QOL) among breast cancer patients. Illness perception strongly negatively impacts quality of life, while demographics have minimal effect. Economic status and education are key demographic factors; emotions and illness consequences dominate.

Table 4 illustrates a weak negative correlation between demographics and quality of life (QoL) at -0.211, which is likely insignificant given the low effect size (f^2 = 0.070). In contrast, illness perception demonstrates a strong negative correlation with QoL at -0.558, suggesting it is a significant predictor (f^2 = 0.487). Additionally, the relationship between demographics and illness perception is negligible, with a correlation coefficient of 0.017 and an effect size close to zero ($f^2 \approx 0$).

Table 5 indicates that the model fit indices demonstrate a moderate alignment between the hypothesized model and the observed data. The Standardized Root Mean Square Residual (SRMR) is 0.104, which exceeds the ideal threshold of 0.08, while the Normed Fit Index (NFI) stands at 0.515, falling short of the recommended value of 0.90. These findings suggest that, although the structural relationships are interpretable, there is potential for enhancing the model by incorporating theoretically justified paths or adjusting indicator loadings for improved accuracy.

Table 6 illustrates that the model accounts for 36% of the variance in Quality of Life (QoL), indicating a moderate predictive power for Demographics and Illness Perception. However, Illness Perception contributes a negligible explained variance (R^2 = 0.0003), suggesting that demographics have little impact on how patients perceive their illness. The adjusted R^2 values (QoL0.353; Illness Perception: -0.006) further

reinforce that the model's strength primarily stems from the QoL outcome.

Discussion

Breast cancer significantly impacts patients' quality of life (QoL), influenced by biological, psychological, and social factors (Huda et al., 2025). This study employed partial least squares structural equation modeling (PLS-SEM) to examine the multivariate relationships between demographics, illness perception, and QoL. Our findings highlight illness perception, particularly emotional and consequence-related dimensions, as the strongest predictor of QoL, while demographic factors showed minimal influence.

The path analysis revealed a strong negative association between illness perception and QoL, indicating that patients with more negative illness perceptions, such as heightened emotional distress or perceived severity of consequences, report significantly lower QoL. This aligns with previous research demonstrating that maladaptive illness beliefs exacerbate psychological distress and reduce functional well-being in cancer patients (Zhang et al., 2016) specifically, the cross-loadings identified emotions and consequences as the most influential dimensions, consistent with studies showing that fear of recurrence and perceived disability mediate QoL outcomes (Husson et al., 2017).

These findings support the Common-Sense Model (CSM) of illness representation (Fernandes & McIntyre, 2020; Hosseini et al., 2025), which posits that patients' cognitive and emotional appraisals of their condition shape coping behaviors and health outcomes. Interventions targeting illness perceptions, such as cognitive-behavioral therapy (CBT) or psychoeducation, may thus improve QoL by modifying catastrophic thinking and enhancing adaptive coping (Xiang et al., 2025)

The Biopsychosocial-Spiritual (BPSS) model offers a broader lens for interpreting these results, emphasizing that health outcomes result from interactions among biological, psychological, social, and spiritual factors (Cheung Siew Li et al., 2023; Gale et al., 2022). Biological Factors. Cancer stage and treatment regimens are critical to prognosis; their impact on QoL is mediated by illness perceptions. For instance, patients with stage II cancer (62.3% of our sample) reported varying QoL levels depending on whether they perceived their diagnosis as manageable or catastrophic. This aligns with BPSS research, which shows that biological severity alone does not dictate patient well-being (Sohl et al., 2015).

Psychological Factors. Our model's dominance of emotional and cognitive appraisals underscores the need for integrated mental health care in oncology. Cognitive-behavioral therapy (CBT) has proven effective in modifying maladaptive illness perceptions and improving QoL in cancer patients (Lau et al., 2020; Xiang et al., 2025). Our findings suggest that targeting specific illness beliefs (e.g., "My cancer will inevitably worsen") could yield more significant QoL improvements than broad demographic-based interventions. Social Factors. Although social determinants (e.g., income, education) are often linked to health disparities, our study found minimal direct influence on QoL. However, social support, which was not explicitly measured in this study, may indirectly influence perceptions of illness. Future studies should explore how social networks buffer or exacerbate illness-related distress.

Spiritual Factors. Despite 99.4% of participants identifying as Muslim, there was no significant association between religious affiliation and QoL (loading = -0.01). The spiritual dimension, though quantitatively minor in this study, warrants deeper qualitative interpretation. In a predominantly Muslim population, spiritual beliefs may be deeply internalized and not always reflected in structured questionnaire items. For example, spiritual surrender ("tawakkal") or belief in divine will ("takdir") may buffer emotional distress but remain unexpressed in standard instruments. Moreover, religious practices like prayer or recitation of the Qur'an may serve as coping strategies,(I. P. Dewi et al., 2020; I. P. I. Dewi & Widiyanti, 2018) yet their protective effects might be overshadowed by strong emotional representations of illness. Future mixed-methods research should incorporate narrative or ethnographic approaches to capture these culturally nuanced spiritual experiences more fully.

Contrary to expectations, demographic variables (age, cancer stage, economic status) exhibited weak predictive power on QoL and no significant effect on illness perception. This contrasts with some literature linking lower socioeconomic status and advanced cancer stages to poorer QoL.(Chouchane et al., 2022; Truong

Donnelly et al., 2015; You et al., 2024) However, the low Cronbach's alpha and AVE for the demographic construct suggest these variables may not function well as a latent factor. Instead, individual demographic indicators (e.g., economic status, loading = 0.775) should be analyzed separately in future studies.

While the model demonstrated acceptable levels of multicollinearity and discriminant validity, evidenced by appropriate cross-loadings that supported the distinctiveness of the constructs, the overall model fit was suboptimal, as indicated by the SRMR and NFI values. The negligible impact of demographics on QoL in our model should be interpreted with caution, especially in the Indonesian context. In collectivist cultures, individual demographic characteristics, such as income or education, may be moderated by strong family and community support systems, thereby weakening their direct influence on psychological outcomes.(Campos et al., 2014; Zhou et al., 2023) In addition, public healthcare subsidies and religious fatalism may equalize experiences across socioeconomic strata, thereby reducing demographic variability in illness perceptions.(Pargament et al., 1998) Thus, cultural context likely moderates the impact of structural inequalities on subjective well-being (Diener et al., 2003; Li et al., 2022; Zhou et al., 2023).

This study highlights the crucial role of illness perception in influencing the quality of life (QoL) of patients with breast cancer. Emotional and cognitive appraisals particularly perceived consequences and emotional distress have a stronger impact on QoL than demographic factors, underscoring the need for integrated psychological and medical interventions. Regular assessment using the *Brief Illness Perception Questionnaire* can help identify patients needing targeted support.

Culturally tailored interventions have proven effective; for example, an Indonesian religion-based caring program incorporating prayer and *dhikr* has improved psychological well-being, while Iranian studies have shown the influence of family and cultural norms on coping. mHealth-based psychosocial interventions also enhance outcomes, especially in low-resource settings. A multidisciplinary, patient-centered approach focusing on modifiable psychological factors can improve well-being and promote better treatment adherence among breast cancer survivors.

This study provides robust insights into illness perception as a key determinant of QoL in breast cancer patients, using a well-powered sample (N=168) and rigorous PLS-SEM analysis. Including multidimensional illness perception indicators (e.g., emotions, consequences) enhances clinical relevance. Methodological transparency (e.g., bootstrapping, reliability/validity tests) aligns with best practices in behavioral oncology research. The cross-sectional design precludes causal inferences. The suboptimal model fit (SRMR = 0.104, NFI = 0.515) suggests potential misspecification, while the homogeneous sample (99.4% Muslim, in the Indonesian context) limits generalizability. Self-reported data may introduce bias.

Future studies should employ longitudinal and experimental designs to better establish causal links between psychological factors, illness perceptions, and quality of life in breast cancer patients. Longitudinal studies can capture changes over time, while randomized controlled trials (RCTs) can more robustly assess the efficacy and mechanisms of psychological interventions. Additionally, future studies should adopt more representative sampling methods, such as random or stratified sampling, to enhance generalizability across diverse populations. Complementing PLS-SEM with covariance-based SEM may also improve model validation by providing a theory-driven confirmation of structural relationships. These methodological enhancements will support more reliable and culturally relevant insights into the psychological well-being of breast cancer patients.

Conclusion

This study emphasizes the importance of illness perception, especially the emotional and consequence-related aspects, as the primary factor influencing the quality of life (QoL) in breast cancer patients, even more so than demographic factors. Although the model needs further refinement, the findings suggest the need for care models informed by patients' psychological experiences of illness. Future research should investigate mediators, such as coping strategies, and consider alternative measurement methods to improve predictive accuracy.

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