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Nurse-Led Meaning-Centered Spiritual Care, Anxiety, and Illness Acceptance in Breast Cancer: A Quasi-Experimental Study

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Abstract

Breast cancer frequently causes anxiety and difficulties with illness acceptance, potentially affecting psychological well-being, treatment engagement, and adaptation to cancer-related challenges. This study evaluated changes in anxiety and illness acceptance following nurse-led meaning-centered spiritual care compared with routine oncology care. A quasi-experimental, non-equivalent control group pretest–posttest study was conducted at two hospitals in Palembang, Indonesia, from May 2025 to April 2026. Using consecutive sampling, 172 women with stage I–III breast cancer were recruited into intervention (n = 86) and control (n = 86) groups according to hospital, without randomization. The intervention involved four individualized nurse-led sessions lasting 45–60 minutes each, delivered twice weekly over two weeks. Sessions integrated spiritual assessment, meaning-centered reflection, adaptive spiritual coping, and reinforcement of hope and illness acceptance, supported by an educational booklet and daily reflective exercises. Both groups received routine oncology care. Anxiety was assessed using the Hospital Anxiety and Depression Scale–Anxiety subscale (HADS-A), and illness acceptance using the Acceptance of Illness Scale (AIS). Between-group differences in pretest–posttest change scores were compared to characterize short-term comparative intervention-related psychological outcome differences. Relative to controls, the intervention group had a greater reduction in HADS-A scores (between-group difference in change: −4.94 points; 95% CI: −5.79 to −4.09; $p < 0.001$; Cohen's $d = 1.76$) and a greater increase in AIS scores (6.57 points; 95% CI: 5.41–7.73; $p < 0.001$; Cohen's $d = 1.70$). Nurse-led meaning-centered spiritual care was associated with greater short-term improvements in both outcomes, although nonrandomized hospital-based allocation limits causal inference.

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1. INTRODUCTION

Breast cancer remains the most frequently diagnosed malignancy among women and continues to represent a major global public health challenge. According to the Global Cancer Observatory, approximately 2.3 million new breast cancer cases and 670,000 deaths occurred worldwide in 2022, accounting for nearly one in four cancers diagnosed among women (Bray et al., 2024). Despite advances in early detection and multimodal treatment, women with breast cancer may experience persistent psychological challenges throughout diagnosis, treatment, and survivorship (Sung et al., 2024). Anxiety is one of the most prevalent psychological symptoms among women with breast cancer, particularly during periods of treatment uncertainty, fear of disease progression, and changes in body image and family roles (National Comprehensive Cancer Network, 2025; Howell et al., 2023). These concerns are relevant to women with stage I–III breast cancer receiving active treatment or follow-up care, as ongoing treatment demands and uncertainty about recovery may complicate psychological adjustment. Beyond anxiety, difficulties accepting the diagnosis and its consequences may further affect emotional well-being, treatment engagement, and adaptation to illness (National Cancer Institute, 2024; Caruso et al., 2022). Therefore, evaluating anxiety alongside illness acceptance is important for understanding complementary psychological needs and informing supportive oncology nursing interventions in this population.

Comprehensive oncology nursing therefore extends beyond symptom management to encompass psychological, emotional, and spiritual care as integral components of person-centered cancer care. The American Nurses Association recognizes spiritual care as a professional nursing responsibility that supports patients in finding meaning, hope, dignity, and connectedness during illness (American Nurses Association, 2021). Likewise, the International Council of Nurses emphasizes that nurses should address patients' holistic needs, including spiritual well-being, throughout the continuum of cancer care (International Council of Nurses, 2021). Theoretically, this holistic approach is supported by Watson's Theory of Human Caring, which proposes that authentic caring relationships and spiritually sensitive interactions facilitate healing, emotional resilience, and human flourishing despite serious illness (Watson & Woodward, 2020). In oncology settings, nurses are uniquely positioned to deliver structured spiritual interventions because they maintain continuous therapeutic relationships with patients, enabling them to identify existential distress, facilitate meaning-making, strengthen adaptive coping, and promote acceptance of illness alongside routine clinical care (Balboni et al., 2022; Puchalski et al., 2023).

Growing evidence indicates that spiritual and meaning-centered interventions may support psychological adjustment among patients with cancer, although their approaches, populations, and measured outcomes differ across studies. Previous research has examined religious practices, mindfulness-based interventions, prayer, chaplaincy services, general spiritual counseling, and meaning-centered psychotherapy, with varying emphasis on existential distress, emotional well-being, spiritual needs, and meaning-making (Breitbart et al., 2022; Warth et al., 2023). Existing interventions also vary considerably in conceptual frameworks, intervention components, duration, delivery methods, and outcome measures, limiting direct comparisons and the applicability of findings to standardized oncology nursing protocols (Caldeira et al., 2023). Although these studies provide important evidence regarding psychological and spiritual support, they do not necessarily establish whether a brief, structured, nurse-delivered meaning-centered spiritual care program is associated with comparative improvements in both anxiety and illness acceptance among women with stage I–III breast cancer. Rather than assuming that illness acceptance has rarely been investigated, the present study addresses the

more specific question of whether changes in this outcome, alongside anxiety, differ between patients receiving structured nurse-led meaning-centered spiritual care and those receiving routine oncology nursing care (Büssing et al., 2022; Phillips et al., 2024).

Important practice and research gaps also persist regarding nurse-led spiritual care for women with breast cancer. In oncology settings, the integration of spiritual assessment and meaning-oriented supportive care into routine nursing practice may be constrained by insufficient training, limited availability of structured intervention protocols, and uncertainty regarding implementation procedures (Ferrell et al., 2023; European Oncology Nursing Society, 2024). Previous studies have examined diverse approaches to spiritual and meaning-centered care, with differences in intervention providers, therapeutic components, delivery formats, and psychological outcomes. These variations make it difficult to determine the specific contribution of structured, nurse-delivered meaning-centered interventions to psychological adjustment in women with breast cancer. Furthermore, the extent to which such interventions influence both anxiety and illness acceptance within the same controlled study remains insufficiently established. Consequently, further context-specific evaluation is warranted to examine the feasibility and potential benefits of integrating structured meaning-centered spiritual care into routine oncology nursing in Indonesia, without assuming that findings from other populations or intervention models are directly transferable.

Therefore, this quasi-experimental study aimed to evaluate differences in changes in anxiety and illness acceptance between women with breast cancer receiving structured nurse-led meaning-centered spiritual care and those receiving routine oncology nursing care. The specific contribution of this study lies in examining a nurse-delivered intervention that incorporates meaning-oriented spiritual support into routine oncology care while assessing two complementary psychological outcomes. It was hypothesized that participants receiving the intervention would demonstrate greater reductions in anxiety, as measured by the Hospital Anxiety and Depression Scale–Anxiety subscale (HADS-A), and greater improvements in illness acceptance, as measured by the Acceptance of Illness Scale (AIS), compared with the control group. Rather than introducing meaning-centered care as an entirely new therapeutic concept, the study evaluates its application within a structured nursing intervention using a nonrandomized controlled pretest–posttest design in Indonesian oncology settings. The findings are intended to provide preliminary comparative evidence to inform the refinement and further evaluation of structured spiritual care interventions, while recognizing that nonrandomized allocation and recruitment from different hospitals limit definitive causal interpretation. Although the intervention was implemented in Indonesia, its cultural appropriateness and broader applicability require further investigation and should not be interpreted as having been formally established through cultural validation.

2. METHODS

A quasi-experimental, non-equivalent control group pretest–posttest study was conducted at two hospitals in Palembang, Indonesia, from May 2025 to April 2026. Sample size planning was conducted using G*Power version 3.1.9.7, based on a repeated-measures analysis of variance framework with two independent groups and two measurement occasions (baseline and post-intervention), focusing on the group-by-time interaction. The planning assumptions included a moderate effect size (Cohen's f = 0.25), 80% statistical power, a significance level of $\alpha = 0.05$, and a correlation of 0.50 between repeated measurements. The moderate effect size was selected as a conventional planning assumption rather than an effect established by preliminary data. The study's documented minimum sample size was 154 participants. Under the planned equal

allocation ratio of 1:1, this minimum requirement corresponded to 77 participants per group. Equal group sizes were selected to facilitate balanced between-group comparisons and optimize statistical precision, assuming comparable outcome variability. The allocation ratio was established for recruitment planning rather than random assignment, as participants were recruited from separate hospitals according to their respective study groups. To accommodate an anticipated 10% attrition rate, the recruitment target was calculated as 154/0.90 = 171.11 and rounded upward to 172 participants, corresponding to a planned recruitment target of 86 women per group. All 172 enrolled participants completed the study without loss to follow-up (Faul et al., 2009).

The independent variable was participation in the nurse-led meaning-centered spiritual care program, whereas the primary outcomes were anxiety and illness acceptance. The intervention was developed by integrating principles of Meaning-Centered Psychotherapy, Watson's Theory of Human Caring, recommendations from the International Consensus Conference on Spiritual Care in Health Care, and contemporary oncology nursing spiritual care guidelines (Breitbart et al., 2018; Watson & Woodward, 2020; International Council of Nurses, 2021; Puchalski et al., 2023). Two trained oncology nurses delivered four individualized face-to-face sessions over two consecutive weeks, each lasting approximately 45–60 minutes. The sessions sequentially addressed therapeutic relationship development and spiritual assessment using the FICA Spiritual History Tool; meaning-centered reflection on life experiences, personal values, and sources of purpose; adaptive spiritual coping through practices aligned with individual spiritual beliefs and preferences; and reinforcement of hope, resilience, illness acceptance, and individualized coping strategies. Participants received an educational booklet and completed daily reflective exercises throughout the intervention period. Intervention fidelity was supported through standardized manuals, structured session checklists, direct supervision, and weekly monitoring by the principal investigator to promote consistency in intervention delivery. A detailed description of the intervention protocol is provided in Table 1.

Participants in the control group received routine oncology nursing care according to institutional protocols, including physical assessment, symptom management, medication and chemotherapy education, nutritional counseling, discharge planning, psychosocial support, and referral to psychologists or hospital chaplains when clinically indicated. Following study completion, control participants received the educational booklet to ensure equitable access to supportive information. After written informed consent was obtained, baseline demographic characteristics and outcome measurements were collected before intervention delivery. Participants in the intervention group subsequently received the structured spiritual care program, while those in the control group continued routine care. Both groups underwent identical post-intervention assessments immediately following the two-week intervention period. Anxiety was measured using the seven-item HADS-A, with lower scores indicating lower anxiety, whereas illness acceptance was assessed using the eight-item Acceptance of Illness Scale (AIS), with higher scores indicating greater illness acceptance (Zigmond & Snaith, 1983; Bjelland et al., 2002; Felton et al., 1984). The Indonesian-language versions of HADS-A and AIS underwent additional linguistic review and preliminary measurement evaluation to assess their suitability for women with breast cancer in the study setting. The reported adaptation procedures included forward–backward translation, expert review, and pilot testing involving 30 women with breast cancer. Expert review was intended to examine the linguistic clarity and clinical relevance of the translated items, while pilot testing assessed internal consistency in the target population. The pilot assessment yielded Cronbach's α coefficients of 0.89 for HADS-A and 0.91 for AIS, indicating good

internal consistency. These findings were interpreted as preliminary reliability evidence rather than comprehensive confirmation of construct validity or cultural equivalence. Outcome assessments were conducted by trained research assistants independent of intervention delivery using standardized procedures. The schedule of enrollment, intervention delivery, and outcome assessments is presented in Table 2.

Data were analyzed using IBM SPSS Statistics version 29.0 (IBM Corp., Armonk, NY, USA). Continuous and categorical variables were summarized using appropriate descriptive statistics. Normality was assessed using the Shapiro–Wilk test and graphical inspection. Baseline differences were examined using independent-samples t tests, Mann–Whitney U tests, chi-square tests, or Fisher's exact tests, as appropriate. The primary reported analysis compared between-group pretest–posttest change scores using independent-samples t tests. Paired t tests assessed within-group changes, while repeated-measures ANOVA examined group-by-time interactions. ANCOVA was considered as a supplementary baseline-adjusted approach but was not included in the reported analyses. Given nonrandomized allocation, potential residual confounding was acknowledged. Mean differences, 95% confidence intervals, and Cohen's d, calculated using pooled change-score standard deviations, quantified comparative effects. Statistical significance was set at $p < 0.05$. All 172 participants completed both assessments; therefore, no imputation was required. Reporting followed the TREND Statement (Des Jarlais et al., 2004).

Ethical approval was obtained from the Medical and Health Research Ethics Committee, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia (Approval No. 133/EC/FKUNSRI/2025), and administrative permission was obtained from both participating hospitals before participant recruitment. Written informed consent was obtained from all participants prior to data collection. Participant anonymity and confidentiality were protected using coded identifiers and secure data storage, and all procedures were conducted in accordance with the Declaration of Helsinki and the International Council for Harmonisation Good Clinical Practice guidelines for research involving human participants (World Medical Association, 2025; International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use, 2023).

Table 1. Components of the nurse-led meaning-centered spiritual care program.

Session	Duration	Intervention Components	Nursing Activities	Expected Outcomes
Session 1	45–60 min	Therapeutic relationship and spiritual assessment	Establish therapeutic rapport, perform spiritual assessment using the FICA Spiritual History Tool, explore illness experiences, identify spiritual needs, sources of hope, and existential concerns	Development of trust, identification of spiritual resources and psychological needs
Session 2	45–60 min	Meaning-centered life reflection	Facilitate guided life review, explore personal values, purpose in life, hope, gratitude, resilience, and meaningful life experiences despite cancer	Enhanced meaning in life and positive cognitive reframing

Session	Duration	Intervention Components	Nursing Activities	Expected Outcomes
Session 3	45–60 min	Meaning-centered spiritual coping	Facilitate reflective dialogue, encourage culturally appropriate spiritual practices, strengthen family connectedness, forgiveness, adaptive coping, and emotional expression	Reduced anxiety, strengthened spiritual coping, and improved emotional adaptation
Session 4	45–60 min	Reinforcement and future planning	Reinforce meaning-making, illness acceptance, hope, resilience, individualized coping strategies, and future life goals; provide educational booklet and encourage daily reflective practice	Improved illness acceptance, sustained resilience, and long-term psychological adaptation

FICA = Faith and Belief, Importance, Community, and Address in Care.

Table 2. Schedule of participant enrollment, intervention delivery, and outcome assessments.

Study Activities	Enrollment (Baseline)	Week 1	Week 2	Post-intervention
Eligibility screening	✓			
Written informed consent	✓			
Demographic and clinical data collection	✓			
HADS-A assessment	✓			✓
Acceptance of Illness Scale (AIS) assessment	✓			✓
Routine oncology nursing care (Control group)		✓	✓	
Nurse-led meaning-centered spiritual care (Intervention group)		Session 1–2	Session 3–4	
Educational booklet (Intervention group)	✓			
Reflective home practice (Intervention group)		✓	✓	
Educational booklet (Control group)				✓

HADS-A = Hospital Anxiety and Depression Scale–Anxiety; AIS = Acceptance of Illness Scale.

3. RESULTS AND DISCUSSION

A total of 196 women with breast cancer were screened for eligibility between May 2025 and April 2026. After screening, 24 women were excluded because they did not meet the eligibility criteria (n = 18) or declined participation (n = 6). Consequently, 172 eligible participants were consecutively enrolled, comprising 86 women in the intervention group

and 86 women in the control group. All participants completed the intervention protocol and post-intervention assessments, resulting in a retention rate of 100% without loss to follow-up or missing outcome data. The participant recruitment, allocation, intervention delivery, and follow-up process are presented in Figure 1.

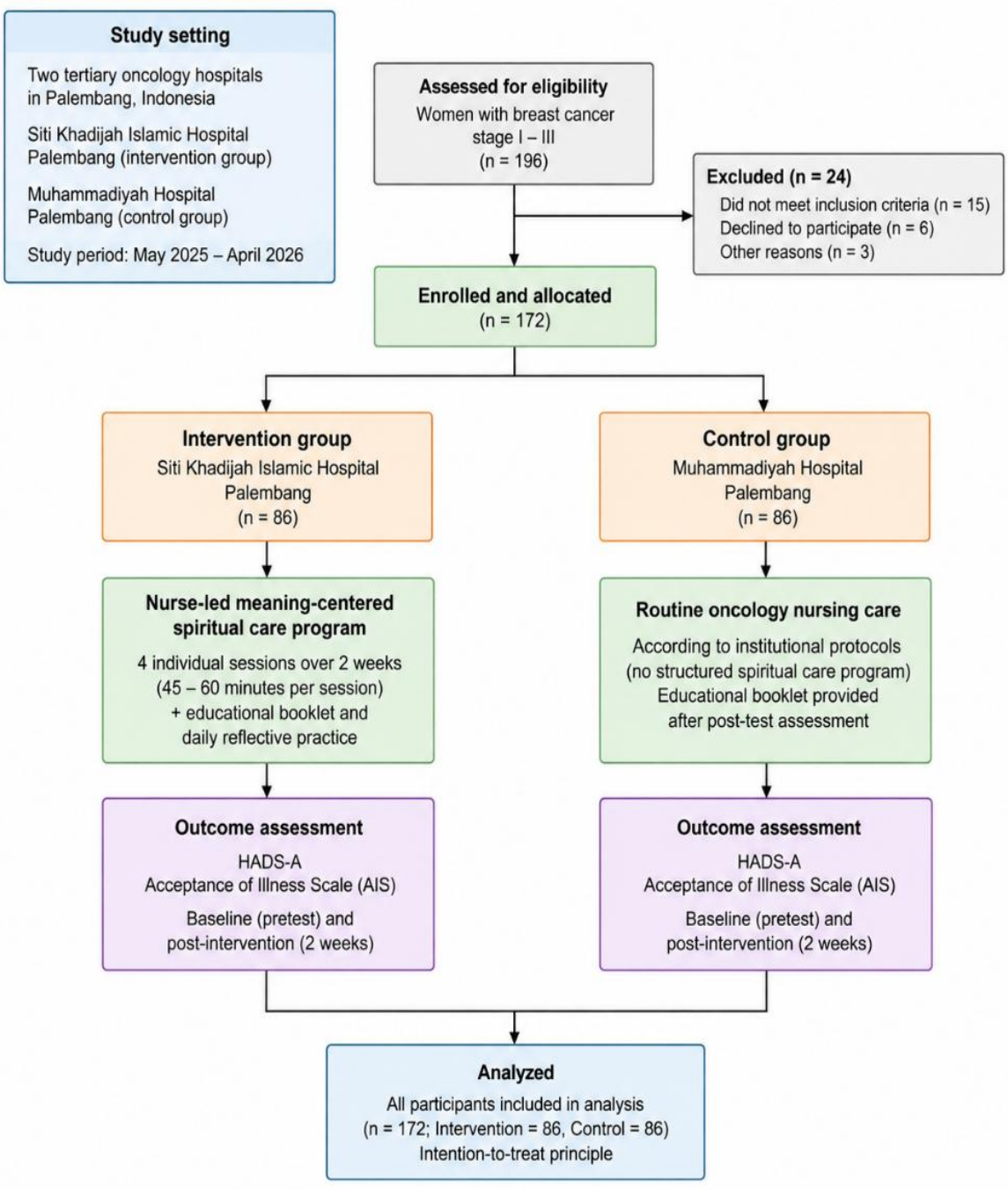


Figure 1. Flow diagram of participant recruitment, group allocation, intervention delivery, and outcome assessment.

Table 3. Baseline demographic and clinical characteristics of participants (N = 172).

Characteristic	Intervention (n = 86)	Control (n = 86)	p-value
Age (years), mean ± SD	49.8 ± 8.7	50.4 ± 9.1	0.68
Married, n (%)	69 (80.2)	71 (82.6)	0.69
Secondary education or higher, n (%)	61 (70.9)	59 (68.6)	0.74
Employed, n (%)	34 (39.5)	31 (36.0)	0.64
Duration since diagnosis (months), mean ± SD	11.2 ± 5.6	10.9 ± 5.8	0.73
Stage I, n (%)	18 (20.9)	17 (19.8)	0.97
Stage II, n (%)	44 (51.2)	46 (53.5)	
Stage III, n (%)	24 (27.9)	23 (26.7)	
Received chemotherapy, n (%)	76 (88.4)	74 (86.0)	0.64
Previous breast surgery, n (%)	58 (67.4)	61 (70.9)	0.63
Hormonal therapy, n (%)	36 (41.9)	34 (39.5)	0.75
At least one comorbidity, n (%)	29 (33.7)	27 (31.4)	0.74
Religion (Islam), n (%)	86 (100)	86 (100)	—

Based on Table 3, the intervention and control groups demonstrated similar observed demographic and clinical characteristics before the intervention. The mean age was 49.8 ± 8.7 years in the intervention group and 50.4 ± 9.1 years in the control group (p = 0.68). Stage II breast cancer was the predominant diagnosis in both groups (51.2% vs. 53.5%), while the majority of participants had undergone chemotherapy (88.4% vs. 86.0%) and previous breast surgery (67.4% vs. 70.9%). The mean duration since diagnosis was also similar (11.2 ± 5.6 vs. 10.9 ± 5.8 months; p = 0.73). No statistically significant differences were observed in the measured demographic or clinical characteristics (all reported p > 0.05), suggesting no detectable baseline differences in these variables. However, given the nonrandomized allocation and recruitment from separate hospitals, these findings do not exclude potential unmeasured confounding.

Table 4. Baseline comparison of primary outcome measures.

Outcome	Intervention	Control	p value
HADS-A score	12.94 ± 2.91	12.71 ± 2.83	0.59
AIS score	22.15 ± 5.28	22.47 ± 5.14	0.68

Based on Table 4, baseline psychological outcomes were equivalent between groups. The intervention group had a mean HADS-A score of 12.94 ± 2.91 compared with 12.71 ± 2.83 in the control group (p = 0.59). Likewise, the mean AIS score was 22.15 ± 5.28 in the intervention group and 22.47 ± 5.14 in the control group (p = 0.68). These findings indicate that both groups entered the study with comparable levels of anxiety and illness acceptance, thereby reducing the possibility that post-intervention differences were attributable to baseline imbalance.

Table 5. Changes in anxiety and illness acceptance following the intervention.

Outcome	Group	Baseline Mean ± SD	Post-intervention Mean ± SD	Mean Difference (95% CI)	p-value	Cohen's d
HADS-A	Intervention	12.94 ± 2.91	7.52 ± 2.84	−5.42 (−7.03 to −3.81)	<0.001	0.86
	Control	12.71 ± 2.83	12.23 ± 2.95	−0.48 (−1.68 to 0.72)	0.42	0.09

Outcome	Group	Baseline Mean ± SD	Post-intervention Mean ± SD	Mean Difference (95% CI)	p-value	Cohen's d
AIS	Intervention	22.15 ± 5.28	29.33 ± 5.17	7.18 (4.95–9.41)	<0.001	0.91
	Control	22.47 ± 5.14	23.08 ± 5.26	0.61 (−1.14 to 2.36)	0.49	0.11

As presented in Table 5, participants receiving the nurse-led meaning-centered spiritual care program demonstrated reductions in anxiety and improvements in illness acceptance following the two-week intervention. Mean HADS-A scores decreased from 12.94 ± 2.91 to 7.52 ± 2.84, corresponding to a within-group mean change of −5.42 points ($p < 0.001$). Mean AIS scores increased from 22.15 ± 5.28 to 29.33 ± 5.17, representing a within-group mean change of 7.18 points ($p < 0.001$). In contrast, the control group showed smaller changes in HADS-A (−0.48 points; $p = 0.42$) and AIS (0.61 points; $p = 0.49$). The 95% confidence intervals for within-group mean changes were recalculated using the standard deviations of paired change scores and the corresponding sample sizes. These findings describe changes within each group and should not be interpreted independently as evidence of comparative intervention effectiveness. The principal comparison was therefore based on between-group differences in change scores, as presented in Table 7, and the group-by-time interaction analysis reported in Table 6.

Table 6. Repeated-measures ANOVA of intervention effects

Outcome	Source	F	p-value	Partial η²
HADS-A	Time	74.21	<0.001	0.30
	Group	1.18	0.28	0.01
	Group × Time	49.87	<0.001	0.23
AIS	Time	81.44	<0.001	0.32
	Group	0.96	0.33	0.01
	Group × Time	56.42	<0.001	0.25

Based on Table 6, repeated-measures ANOVA demonstrated significant interaction effects between treatment group and assessment time for both anxiety and illness acceptance. Significant group-by-time interactions were observed for HADS-A ($F = 49.87$, $p < 0.001$, partial $\eta^2 = 0.23$) and AIS ($F = 56.42$, $p < 0.001$, partial $\eta^2 = 0.25$), indicating that changes over time differed significantly according to intervention status. The large partial eta-squared values further suggest that the nurse-led meaning-centered spiritual care program accounted for a substantial proportion of the observed improvements in psychological outcomes beyond those achieved through routine oncology nursing care.

Table 7. Between-Group comparison of changes in anxiety and illness acceptance scores.

Outcome	Intervention Δ Mean ± SD	Control Δ Mean ± SD	Between-Group Mean Difference (95% CI)	p-value	Cohen's d
HADS-A	−5.42 ± 3.12	−0.48 ± 2.46	−4.94 (−5.79 to −4.09)	<0.001	1.76
AIS	7.18 ± 4.28	0.61 ± 3.41	6.57 (5.41 to 7.73)	<0.001	1.70

Δ = post-intervention score minus baseline score. Cohen's d is presented as the absolute standardized between-group difference in mean change scores, calculated using the pooled standard deviation of change scores. Confidence intervals are recalculated from the reported group sizes and change-score standard deviations using an independent-samples t approach.

As shown in Table 7, the between-group comparison of change scores demonstrated significantly greater improvements in both primary outcomes among participants receiving nurse-led meaning-centered spiritual care than among those receiving routine oncology nursing care. The intervention group exhibited a greater reduction in anxiety, with a between-group mean difference in HADS-A change scores of −4.94 points (95% CI: −5.79 to −4.09; $p < 0.001$). Similarly, the improvement in illness acceptance was greater in the intervention group, with a between-group mean difference in AIS change scores of 6.57 points (95% CI: 5.41 to 7.73; $p < 0.001$). Both outcomes demonstrated large standardized between-group differences, with Cohen's *d* values of 1.76 for anxiety and 1.70 for illness acceptance. These effect sizes were calculated by dividing the absolute difference between the group mean change scores by the pooled standard deviation of the corresponding change scores. Collectively, these findings indicate that participation in the nurse-led meaning-centered spiritual care program was associated with substantially greater short-term reductions in anxiety and improvements in illness acceptance compared with routine oncology nursing care, although causal inference remains limited by the nonrandomized study design.

Finally, the clinical relevance of these findings was further explored through changes in participant classifications based on predefined outcome thresholds. In the intervention group, the proportion of women with clinically significant anxiety (HADS-A ≥11) decreased from 69.8% at baseline to 23.3% following the intervention, compared with a smaller reduction from 68.6% to 64.0% in the control group. Similarly, the proportion of participants achieving high illness acceptance (AIS ≥30) increased from 18.6% to 60.5% in the intervention group, whereas 20.9% of control participants met this threshold at post-intervention assessment. These descriptive categorical findings complement the continuous outcome analyses presented in Table 7, suggesting that the greater improvements observed in the intervention group were accompanied by favorable shifts in anxiety severity and illness acceptance classifications. Nevertheless, the primary comparative interpretation was based on between-group differences in continuous change scores, while categorical findings were considered supplementary and exploratory.

The present study demonstrated that a structured nurse-led meaning-centered spiritual care program produced clinically meaningful reductions in anxiety while substantially enhancing illness acceptance among women with breast cancer compared with routine oncology nursing care. Participants who received the intervention exhibited a large reduction in anxiety (Cohen's $d = 0.86$) together with a marked improvement in illness acceptance (Cohen's $d = 0.91$), whereas women receiving standard care showed only negligible changes in both outcomes. The significant group-by-time interaction effects and large between-group effect sizes further indicate that these improvements were attributable to the intervention rather than the natural course of psychological adaptation during treatment. These findings reinforce the growing recognition that psychological adjustment to cancer cannot be addressed solely through symptom management but requires nursing interventions that integrate existential, emotional, and spiritual dimensions of care. Meaning-centered spiritual care may enable patients to reinterpret the experience of illness, preserve personal identity, strengthen hope, and foster adaptive coping, thereby promoting resilience during cancer treatment. Similar mechanisms have been described in contemporary psycho-oncology literature, where meaning-making interventions are associated with improved emotional adaptation and reduced existential distress among patients with advanced and non-advanced cancers (Rodin et al., 2021; Applebaum et al., 2022; Fegg et al., 2023).

One important contribution of this study lies in demonstrating the effectiveness of a nurse-led, rather than psychologist-led or chaplain-led, meaning-centered intervention.

Nurses maintain continuous therapeutic relationships with patients throughout diagnosis, treatment, and follow-up, placing them in a unique position to recognize spiritual distress and facilitate ongoing meaning-making as part of routine clinical encounters. The structured intervention used in this study combined spiritual assessment, guided life reflection, culturally appropriate spiritual coping, and reinforcement of hope and future purpose, allowing psychological support to be integrated seamlessly into standard oncology nursing practice. Previous implementation studies have shown that nurse-delivered psychosocial interventions are more sustainable and accessible than specialist-led services because they require fewer additional resources while improving continuity of care and patient engagement (Charalambous et al., 2021; Howell et al., 2024; Leuteritz et al., 2023). The present findings therefore provide practical evidence that oncology nurses can effectively deliver structured meaning-centered spiritual care after appropriate training and standardized intervention protocols.

The observed improvement in illness acceptance represents another clinically important finding because acceptance of illness is increasingly recognized as a central determinant of long-term psychological adaptation among individuals living with cancer. Women with breast cancer frequently experience uncertainty, altered body image, fear of recurrence, and disruption of social and family roles, all of which may compromise acceptance and emotional well-being. By encouraging patients to identify personal values, recognize enduring life meaning, strengthen spiritual resources, and develop future-oriented coping strategies, the intervention appears to facilitate cognitive reframing and acceptance of illness rather than avoidance or emotional suppression. This interpretation is consistent with emerging evidence indicating that acceptance-based and meaning-oriented interventions improve psychological flexibility, resilience, and quality of life among oncology populations (Greer et al., 2022; Hulbert-Williams et al., 2021; Arch et al., 2023). Furthermore, greater illness acceptance has been associated with improved treatment adherence, lower psychological distress, stronger self-management, and better survivorship outcomes, highlighting its relevance as an important patient-centered outcome beyond symptom reduction (Cavers et al., 2021; Costa et al., 2024).

The findings also have important implications for oncology nursing practice, particularly in culturally diverse settings where spirituality constitutes an integral component of patients' coping resources. Although international cancer care guidelines increasingly advocate holistic care, structured spiritual assessment and meaning-oriented nursing interventions remain inconsistently implemented in routine clinical practice. The present study demonstrates that a brief four-session intervention delivered over two weeks can achieve substantial psychological benefits without requiring highly specialized mental health services. Incorporating standardized spiritual assessment tools, structured meaning-centered communication, reflective exercises, and individualized spiritual coping strategies into routine nursing care may therefore represent a feasible and scalable approach to strengthening psychosocial support for women with breast cancer. These findings align with recent recommendations from global oncology organizations emphasizing the integration of person-centered supportive care throughout the cancer continuum and the expanding role of nurses in delivering evidence-based psychosocial interventions (Ferrell & Temel, 2022; Chan et al., 2023; World Health Organization, 2024).

Several limitations should nevertheless be considered when interpreting the present findings. The quasi-experimental design without random allocation may have introduced residual selection bias despite the comparable baseline characteristics observed between groups. In addition, outcomes were evaluated immediately after completion of the intervention; therefore, the long-term sustainability of anxiety reduction and illness acceptance remains uncertain. The study was also conducted in two hospitals within one

Indonesian city, which may limit generalizability to other healthcare systems and cultural contexts. Future multicenter randomized controlled trials with longer follow-up periods are warranted to determine whether the psychological benefits of nurse-led meaning-centered spiritual care are maintained over time and whether they translate into broader outcomes such as treatment adherence, symptom burden, quality of life, spiritual well-being, and survival. Economic evaluations and implementation studies would also be valuable to determine the cost-effectiveness and scalability of integrating structured meaning-centered spiritual care into routine oncology nursing services across different healthcare settings.

4. CONCLUSION

This quasi-experimental study found that participation in a structured nurse-led meaning-centered spiritual care program was associated with greater reductions in anxiety and improvements in illness acceptance among women with breast cancer compared with routine oncology nursing care. The observed between-group differences and large effect sizes suggest potentially beneficial psychological outcomes; however, causal interpretations are limited by nonrandomized allocation and potential confounding between hospital settings and intervention exposure. These findings suggest a potential role for oncology nurses in incorporating meaning-centered reflection, spiritual assessment, therapeutic communication, and culturally responsive coping strategies into person-centered cancer care. Nevertheless, the feasibility of routine implementation and effects on broader well-being were not directly evaluated. Further multicenter randomized controlled trials with longer follow-up periods are recommended to establish causal effectiveness, assess the sustainability of psychological outcomes, and evaluate implementation feasibility and generalizability across diverse oncology settings.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

ETHICAL CONSIDERATIONS

The study was approved obtained from the Medical and Health Research Ethics Committee, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia (Approval No. 133/EC/FKUNSRI/2025), and administrative permission was obtained from both participating hospitals before participant recruitment. Written informed consent was obtained from all participants prior to data collection. Participant anonymity and confidentiality were protected using coded identifiers and secure data storage, and all procedures were conducted in accordance with the Declaration of Helsinki and the International Council for Harmonisation Good Clinical Practice guidelines for research involving human participants.

AUTHOR CONTRIBUTIONS

Arena Lestari contributed to Conceptualization, methodology, investigation, participant recruitment, intervention implementation, data collection, formal analysis, data curation, writing—original draft, and project administration. Aris Citra Wisuda contributed to Conceptualization, methodology, validation, supervision, formal analysis, interpretation of data, writing—review and editing, critical revision of the manuscript for important intellectual content, and final approval of the manuscript. Suzanna contributed to Investigation, participant recruitment, data collection, validation, resources, writing—review and editing, and final approval of the manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work. All authors have read

and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

During the preparation of this manuscript, the authors used generative artificial intelligence (ChatGPT, OpenAI) solely to improve language quality, grammar, readability, and manuscript organization. Artificial intelligence was not used for study design, data collection, data analysis, interpretation of findings, or generation of scientific conclusions. All scientific content, critical interpretation, and editorial decisions were independently developed, verified, and approved by the authors. The authors accept full responsibility for the accuracy, originality, and integrity of the manuscript.

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