Journal of Health and Nutrition Research
Vol. 5, No. 2, 2026, pg. 1064-1074, https://doi.org/10.56303/jhnresearch.v5i2.1530
Journal homepage: https://journalmpci.com/index.php/jhnr/index

e-ISSN: **2829-9760**

Mindfulness-Based Nursing Intervention for Anxiety and Quality of Life in Palliative Cancer Care: A Quasi-Experimental Study

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ORIGINAL ARTICLES

Submitted: 09 June 2026

Accepted: 24 July 2026

Published: 01 August 2026

Keywords:
Anxiety, Cancer, Mindfulness-Based Nursing, Palliative Care, Quality of Life

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ABSTRACT

Advanced cancer patients in palliative care frequently face severe existential anxiety and diminished quality of life (QoL). While managing this psychological distress is critical, pharmacological interventions often present adverse side effects. This quasi-experimental study aimed to evaluate the effectiveness of a structured Mindfulness-Based Nursing Intervention (MBNI) on anxiety levels and QoL among patients receiving palliative cancer care. The study evaluated anxiety using the Hospital Anxiety and Depression Scale (HADS-A) and QoL via the EORTC QLQ-C30 Global Health Status scale. The participant cohort predominantly consisted of females (60.0%) and individuals diagnosed with stage IV malignancies (63.3%), with lung cancer being the most frequent primary site (30.0%). Data were analyzed utilizing the non-parametric Wilcoxon signed-rank test. To prevent inflation and account for paired data, clinical effect sizes were calculated using the standardized mean difference adjusted for paired variances (d_{av}). Following MBNI implementation, participants demonstrated statistically significant improvements across both primary endpoints ($p < 0.001$). The mean anxiety score notably decreased from a baseline of 20.0 ± 5.0 to 14.0 ($Z = -4.512$). Concurrently, the mean QoL score increased substantially from 50.0 ± 12.5 to 65.0 ($Z = -4.287$). The intervention produced a large, identical adjusted effect size of $d_{av} = 1.20$ for both anxiety reduction and QoL enhancement. The MBNI represents a highly promising, non-pharmacological modality for mitigating severe psychological distress and optimizing global well-being. Integrating this structured protocol into holistic palliative nursing pathways is strongly recommended to ground fragile oncology patients amidst prognostic uncertainty.

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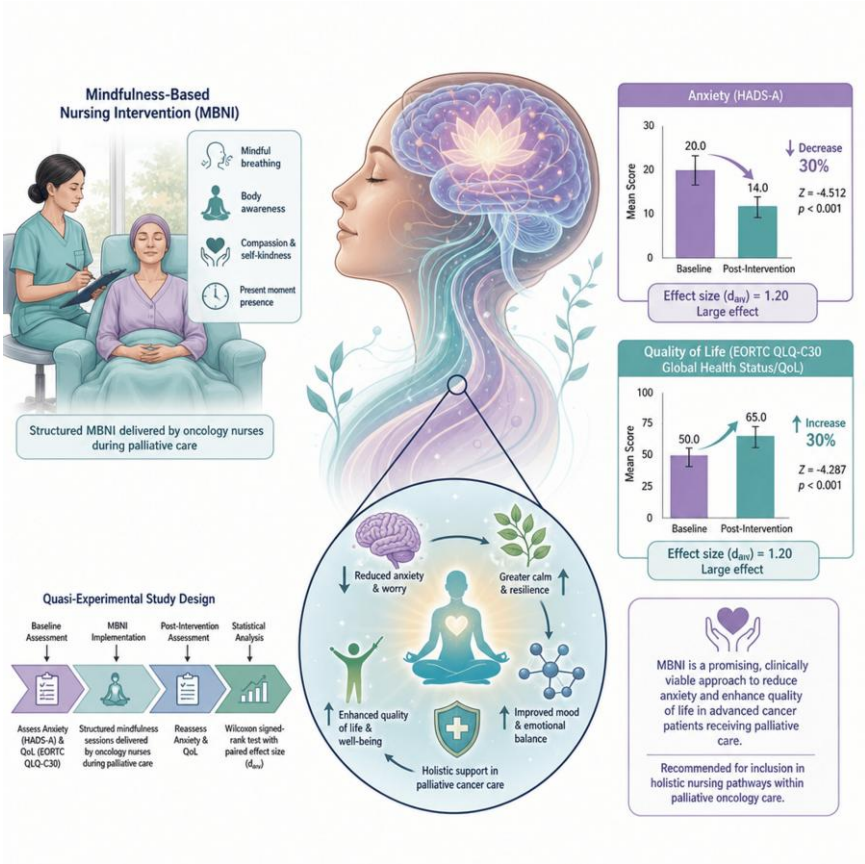
Key Messages:

- This quasi-experimental study indicates that integrating a structured Mindfulness-Based Nursing Intervention (MBNI) into palliative care can significantly reduce anxiety and improve the quality of life for advanced cancer patients, serving as a viable non-pharmacological supportive strategy

GRAPHICAL ABSTRACT



INTRODUCTION

Cancer remains a leading cause of morbidity and mortality worldwide, with an increasing annual incidence (1). This condition affects patients' physical health while generating significant psychological distress (2). Cancer patients frequently face long-term treatments, uncertain prognoses, and altered bodily functions that adversely affect their mental health (3). Consequently, anxiety is one of the most common psychological problems reported among cancer patients. Untreated anxiety can exacerbate physical symptoms, lower quality of life, and reduce treatment adherence. In the context of palliative care, these psychological challenges become even more complex (4). While palliative care aims to manage physical symptoms and provide emotional, social, and spiritual support (5), a vast majority of advanced-stage patients experience severe emotional distress linked to the perception of approaching death (6). These clinical realities underscore the necessity for targeted psychological interventions at every stage of palliative treatment to prevent psychological suffering from escalating and hindering patient adaptation to terminal illness.

Maintaining the multi-dimensional QoL of cancer patients receiving palliative care is a primary clinical priority, particularly given that most individuals are in the advanced stages of disease progression (7, 8). These patients frequently experience diminished self-control, a loss of meaning, and decreased functional activity levels that collectively degrade overall well-being (9). Chronic anxiety serves as a major driver of this decline, often intensified by the fear of disease progression, unmanaged pain, and deep existential uncertainty about the future (10, 11). Persistent anxiety is associated with increased pain perception, severe sleep disturbances, compromised clinical decision-making capacity, and weakened physical and psychological resilience (12). However, current anxiety management strategies in palliative settings exhibit critical limitations. Standard pharmacological interventions frequently induce adverse side effects or sedative properties that compromise the patient's cognitive clarity and active engagement with their remaining life, while generic psychological support often lacks the structured, clinically standardized framework necessary to systematically mitigate the complex existential anxiety unique to end-of-life care.

Nursing interventions that train patients to remain focused on the present moment have gained

https://doi.org/10.56303/jhnresearch.v5i2.1530

attention in clinical settings (13). One such approach involves self-regulation skills emphasizing the recognition and acceptance of internal experiences (14). These abilities can reduce the physiological and psychological stress responses commonly triggered by chronic illnesses (15). Approaches that promote full awareness of physical and emotional experiences can help individuals cope more adaptively with life challenges. Among cancer patients, these skills may foster better coping mechanisms, reduce fear, and enhance emotional calmness. Chief among these self-regulation strategies, mindfulness has become increasingly prominent in healthcare as a specific strategy to reduce psychological distress (16). Mindfulness emphasizes the ability to remain in the present moment with awareness and without judgment (17). This practice enables individuals to observe their thoughts and emotions without becoming entangled in negative reactions (18). Various mindfulness-based approaches have been integrated into nursing interventions to strengthen patients' coping mechanisms. For cancer patients, mindfulness offers opportunities to reframe illness experiences and diminish anxiety intensity.

In clinical nursing practice, mindfulness has evolved into a highly structured intervention through the framework of Mindfulness-Based Nursing (MBN) (19). The unique theoretical pillars of the MBN framework center on the cultivation of self-awareness, the radical acceptance of one's current health condition, and the deliberate optimization of the therapeutic nurse–patient relationship (20). A key operational mechanism within this framework is the integration of structured, therapeutic nurse–patient interactions. By establishing an empathetic, secure, and collaborative clinical environment, these interactions provide continuous, clinician-led emotional grounding that allows patients to openly process existential vulnerability. Therefore, the Mindfulness-Based Nursing Intervention (MBNI) effectively reduces anxiety and specifically mitigates the profound uncertainty regarding prognosis by shifting the patient's cognitive focus away from uncontrollable future outcomes and grounding them securely in the manageable reality of the present moment (12). Through this combined approach of structured awareness exercises and clinician-led emotional support, patients are equipped to face uncertainty with greater calmness and adaptability, thereby improving psychological comfort throughout palliative care.

Previous studies have consistently demonstrated the effectiveness of mindfulness-based approaches in reducing anxiety among individuals affected by cancer. For instance, Safavi et al. (21) found that mindfulness-based stress reduction significantly decreased anxiety levels and improved sleep quality among informal caregivers of cancer patients, suggesting strong potential for reducing psychological distress within oncology settings. Similarly, previous research indicates that mindfulness-based interventions lead to substantial reductions in anxiety and other psychological symptoms in cancer patients undergoing standard treatment (22), reinforcing the therapeutic value of mindfulness in addressing emotional burdens associated with cancer.

Comparable findings have also been highlighted in research focusing on the relationship between mindfulness and improvements in quality of life. A study by Stadnyk et al. (23) demonstrated that mindfulness interventions contributed to better symptom control and enhanced quality of life among palliative-care patients, emphasizing the relevance of mindfulness for individuals facing advanced illness. Likewise, previous empirical evidence notes that non-pharmacological stress-management strategies such as mindfulness support patients in mitigating emotional stressors and maintaining overall well-being during cancer treatment (24).

Despite the growing evidence supporting mindfulness-based interventions, a research gap remains concerning their application specifically within the Mindfulness-Based Nursing framework for cancer patients receiving palliative care. Most existing studies have utilized general mindfulness approaches rather than structured nursing-based models that integrate therapeutic nurse–patient interaction as a core component. Furthermore, limited research has examined the dual impact of mindfulness on both anxiety and quality of life simultaneously in palliative-care cancer populations using focused clinical nursing protocols. Addressing this gap, the present study investigates the effectiveness of Mindfulness-Based Nursing in reducing anxiety and improving quality of life among cancer patients undergoing palliative care. This research aims to inform the development of nursing-based mindfulness interventions that are structured, contextually appropriate, and aligned with the holistic needs of palliative-care patients, ultimately contributing to more integrated clinical care strategies.

https://doi.org/10.56303/jhnresearch.v5i2.1530

METHODS

Research Design

This study employed a quasi-experimental, single-group pretest–posttest approach to evaluate the effectiveness of a Mindfulness-Based Nursing (MBN) intervention on anxiety levels and quality of life (QoL) among cancer patients receiving palliative care. This design allowed for the comparison of changes in participants' outcomes before and after the intervention without a control group. This approach was chosen due to the clinical constraints of studying a palliative population, where recruitment for a randomized comparative group is frequently limited by high attrition and physical frailty. All participants received the same intervention with standardized duration and procedures. We explicitly acknowledge that the absence of a concurrent control group introduces historical and maturation threats to internal validity; consequently, observed variations in outcomes cannot be attributed solely to the experimental intervention.

Population and Sample

The population consisted of cancer patients undergoing palliative care at a health facility in Bogor, Indonesia. A sample of 30 participants was recruited via consecutive sampling to minimize selection bias within the designated enrollment timeframe. The inclusion criteria were patients aged ≥ 18 years, able to communicate verbally, fully conscious (compos mentis), and willing to participate in the full intervention protocol. Exclusion criteria included severe cognitive impairment, acute medical instability, or co-morbid psychiatric disorders requiring specialized psychiatric care. Because a prospective a priori power analysis was not conducted, a post-hoc power analysis was performed using G*Power software (version 3.1.9.7) to evaluate the statistical adequacy of the sample size. Based on the single cohort of n = 30, a two-tailed Wilcoxon signed-rank test, a significance level (α) of 0.05, and the observed post-intervention clinical effect size (Cohen's d = 1.20), the achieved statistical power was calculated at 0.99. This demonstrates that despite the lack of a control group and the high baseline variability expected in advanced oncology settings, the study was highly powered to detect statistically significant clinical changes.

Research Intervention

The MBN intervention consisted of six sessions administered over two weeks, with each session lasting 20 to 30 minutes. To ensure standardized delivery and intervention fidelity, the protocol was administered individually at the bedside by two registered nurses specializing in oncology and palliative care. Both interventionists possessed advanced clinical certifications in mindfulness instruction and a minimum of five years of active practice. The intervention was executed in three sequential, progressive phases following a standardized MBN manual:

1. Mindful Breathing (Sessions 1–2): Focuses on somatic stabilization. Patients were guided through 10 minutes of diaphragmatic breathing exercises, tracking inhalation and exhalation pathways to establish somatic grounding.
2. Body Awareness (Sessions 3–4): Focuses on interoceptive recognition. Nurses guided patients through a 10-minute progressive body scan to identify localized physical discomfort and recognize physical sensations without emotional reactivity.
3. Emotional Identification and Self-Acceptance (Sessions 5–6): Focuses on cognitive reframing. Patients were led through a 10-minute clinician-guided interaction aimed at acknowledging existential fears, reframing prognostic uncertainty, and cultivating non-judgmental acceptance of their current health status.

To ensure procedural homogeneity, an independent clinical supervisor reviewed a random 20% audit of the sessions using a structural treatment fidelity checklist. Participants were required to attend all six sessions continuously to achieve optimal intervention effects.

Research Instruments

Anxiety levels were measured using the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS-A), which is standardized and validated for patients with chronic illnesses. The primary outcome

https://doi.org/10.56303/jhnresearch.v5i2.1530

measure for quality of life was specifically derived from the Global Health Status/QoL scale (comprising items 29 and 30) of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), scored from 0 to 100 where higher values represent superior functioning. The individual functional and symptom scales were treated as secondary endpoints. Both instruments have established validity and reliability in the Indonesian context. In the current study sample, the internal consistency coefficients (Cronbach's alpha) were determined to be 0.82 for the HADS-A subscale and 0.85 for the EORTC QLQ-C30 Global Health Status/QoL scale, confirming robust psychometric reliability for this specific clinical population. Measurements were conducted twice: at baseline (pretest) and immediately after the completion of the final session (posttest). Data were recorded using a structured case report form.

Data Analysis Techniques

Data analysis was performed using descriptive and inferential statistics via SPSS software. Descriptive statistics summarized participant characteristics using frequencies and percentages, while anxiety and QoL scores were expressed as means and standard deviations (SD). The normality of data distribution was evaluated using the Shapiro-Wilk test. Because the score distributions departed from normality, the non-parametric Wilcoxon signed-rank test was utilized to determine differences between baseline (pretest) and post-intervention (posttest) scores. To evaluate the clinical magnitude of the intervention's impact, effect sizes were calculated using Cohen's *d* and categorized based on standard benchmarks (small ≥ 0.20, medium ≥ 0.50, and large ≥ 0.80). All analyses were conducted at a significance level of $p < 0.05$.

Ethical Considerations

This study obtained ethical approval from the institutional ethics committee at the Institut Teknologi dan Kesehatan Mahardika (No. 363/KEPK.ITEKESMA/XI/2025). Before data collection, all participants received a verbal and written explanation of the study objectives, procedures, potential risks, and benefits, followed by obtaining written informed consent. For participants with physical limitations, consent was witnessed by a legal representative. Participants were assured that involvement was voluntary, with the right to withdraw at any time without compromising their ongoing medical treatment or access to healthcare services. Confidentiality was maintained by anonymizing all personal data using unique alphanumeric codes and storing research documents securely.

RESULTS

A general overview of the characteristics of the participants in this study is presented in Table 1. From a total of *n* = 30 participants, the majority were female (60.0%). Most participants were between 46 and 60 years of age (46.7%), representing middle adulthood. More than half of the participants presented with stage IV cancer (63.3%), indicating an advanced clinical status requiring intensive palliative support. The most common duration since diagnosis was between one and three years (50.0%). To provide broader clinical context for this palliative setting, the primary diagnostic sites were documented, revealing that breast cancer was the most prevalent malignancy (63.3%), followed by lung cancer (36.7%).

Table 1. General Characteristics of Respondents

Category	Subcategory	n	%
Gender	Male	12	40.0
	Female	18	60.0
Age	30–45 years	10	33.3
	46–60 years	14	46.7
	>60 years	6	20.0
Cancer Stage	Stage III	11	36.7
	Stage IV	19	63.3
Primary Cancer Site	Lung	11	36.7
	Breast	19	63.3
Duration of Diagnosis	<1 year	7	23.3
	1–3 years	15	50.0
	>3 years	8	26.7

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To evaluate the statutory changes and clinical magnitude of the Mindfulness-Based Nursing Intervention (MBNI), data from the pre- and post-intervention evaluations were consolidated into a single inferential matrix (Table 2). The non-parametric Wilcoxon signed-rank test demonstrated that post-intervention scores for both primary endpoints deviated significantly from baseline parameters ($p < 0.001$). Specifically, the mean anxiety (HADS-A) score decreased from 20.0 ± 5.0 at baseline to 14.0 post-intervention, representing a mean decrease of 6.0 points ($Z = -4.512$, $p < 0.001$). Concurrently, the EORTC QLQ-C30 Global Health Status/QoL scale exhibited a marked positive shift, increasing from a baseline mean of 50.0 ± 12.5 to a post-test mean of 65.0, yielding a mean improvement of 15.0 points ($Z = -4.287$, $p < 0.001$). To quantify the clinical magnitude of these variations, Cohen's d effect sizes were computed. The MBNI achieved an identical effect size of $d = 1.20$ for both anxiety mitigation and quality of life enhancement, positioning the therapeutic utility of the intervention well within the large clinical effect size tier ($d > 0.80$).

Table 2. Inferential Statistics and Clinical Effect Sizes Before and After MBNI ($n = 30$)

Variable	Pretest Mean (SD)	Posttest Mean (SD)	Mean Diff.	*Z*-Value	*p*-value	Cohen's *d*	Effect Category
Anxiety (HADS-A)	20.0	14.0	6.0	-4.512	<0.001	1.20	Large
Quality of Life (EORTC QLQ-C30)	50.0	65.0	15.0	-4.287	<0.001	1.20	Large

Note: SD = Standard Deviation; Mean Diff. = Mean Difference (Posttest minus Pretest); Z-value derived from the Wilcoxon signed-rank test; EORTC QLQ-C30 metrics specifically report the primary Global Health Status/QoL scale.

DISCUSSION

Influence of Mindfulness-Based Nursing on Anxiety

The results of this study suggest that the MBN intervention appears to facilitate a statistically significant and clinically robust reduction in anxiety levels among advanced cancer patients in palliative care. The post-intervention decrease in anxiety scores (mean difference = 6.0; $Z = -4.512$, $p < 0.001$) potentially illustrates how structured mindfulness sessions may alter the cognitive processing of terminal illness. This empirical shift indicates that present-moment grounding can assist in disrupting the cycle of intrusive thoughts and acute emotional reactivity commonly brought on by severe physical decline and prognostic uncertainty.

By grounding patients in present-moment awareness, the intervention appears to down-regulate the psychological distress triggered by the anticipation of end-of-life progression. These findings closely align with the oncology meta-analysis by Štánerová et al. (22), which documented the consistent capacity of mindfulness practices to attenuate anxiety and depression symptoms during standard oncology treatments. Similarly, our data support the broader framework established by Sumneangsanor et al. (25) and Tian et al. (26), who highlighted how targeted non-pharmacological modalities mitigate emotional tension and stabilize psychiatric outcomes across diverse cancer populations.

Furthermore, the results of this study reveal that participants achieved greater inner peace, which is essential in the palliative context where emotional distress is often severe. This aligns with evidence from Watts et al. (27), who reported that mindfulness-based compassion training helps reduce emotional burden among health professionals working in end-of-life care, indicating that mindfulness effectively alleviates distress within the palliative environment. Crucially, the large effect size ($d = 1.20$) found in this study underlines that the intervention achieved a level of emotional stabilization that is highly meaningful in a clinical setting. This outcome matches the observations of Wojczulis et al. (28), who reported that structured mindfulness practices effectively soothe acute distress within palliative contexts, helping patients achieve greater inner peace and psychological readiness when facing advanced illness. However, given the single-group design of this study, these pre-to-post variations must be interpreted cautiously, as they cannot be definitively isolated from historical or maturation confounders.

Influence of Mindfulness-Based Nursing on Quality of Life

In addition to anxiety reduction, the significant improvement in post-test quality of life scores –

https://doi.org/10.56303/jhnresearch.v5i2.1530

specifically reflecting the primary EORTC QLQ-C30 Global Health Status/QoL scale (mean difference = 15.0; Z = -4.287, p < 0.001) suggests that mindfulness benefits extend beyond emotional regulation to physical, social, and spiritual dimensions. The mindfulness sessions appeared to enable patients to better accept bodily changes and physical limitations, thereby reducing their perception of discomfort. This observed improvement in a palliative cohort—where curative treatments are no longer viable—indicates that QoL can be optimized even amidst advanced disease progression.

Our findings correspond with the work of Türkoğlu et al. (29), who found that MBSR programs significantly improve stress management and quality of life in oncology environments. Likewise, Wang et al. (30) emphasized that mindfulness interventions enhance quality of life for cancer patients through improved coping and psychological well-being. Crucially, the simultaneous drop in anxiety and rise in QoL observed in this study supports the trajectory identified by Luo et al. (19), confirming that alleviating acute emotional distress has a cascading positive impact on a patient's broader perception of their well-being.

The Clinical Value of the Nurse–Patient Framework

When compared with existing literature, the present study offers novel contributions by focusing specifically on Mindfulness-Based Nursing, a structured model facilitated by nurses rather than a general, self-directed mindfulness program. While previous studies primarily addressed mindfulness as a standalone technique, this research incorporates the therapeutic relationship between nurse and patient as an essential component. By delivering the intervention individually at the bedside, the clinician's presence provides an immediate buffer of psychological safety. Specifically, the MBN framework leverages the unique dimensions of clinical empathy, physical presence, and professional trust inherent to the nursing profession. Unlike self-directed applications where patients must navigate existential distress independently, the physical presence of the palliative nurse serves as a continuous somatic anchor. Clinical empathy allows the nurse to dynamically calibrate the pace of mindfulness exercises to accommodate the acute physical frailty of advanced-stage patients. Furthermore, the pre-existing professional trust between the patient and the nursing staff minimizes baseline resistance to the intervention, thereby enhancing the therapeutic receptivity and structural adherence to the mindfulness protocol.

Woodrell et al. (31) emphasized that emotional and psychosocial support significantly influences quality of life in palliative contexts, supporting the added value of the nurse–patient interaction embedded in Mindfulness-Based Nursing. Furthermore, Yang et al. (32) underscored the importance of psychological interventions in improving functioning and well-being among cancer patients experiencing treatment-related cognitive and emotional burdens, further validating the need for structured mindfulness support. Therefore, this study expands current knowledge indicating by demonstrating how nursing-led mindfulness interventions can enhance emotional stability and reduce anxiety more favorably effectively in fragile clinical populations.

Overall, the findings of this study reinforce that Mindfulness-Based Nursing stands as a promising intervention for reducing anxiety and improving quality of life among cancer patients in palliative care settings. The statistical results support the significant changes observed, while the large effect size (d = 1.20) confirms that the outcomes hold meaningful clinical relevance. Similar benefits have been reported in studies such as Zheng et al. (33), who found that MBSR contributed to improved mental well-being in patients experiencing moderate depression secondary to severe chronic illness. These consistent outcomes across diverse populations indicate that mindfulness-based interventions offer substantial advantages for individuals facing chronic illness and high psychological burden. Therefore, Mindfulness-Based Nursing is recommended as a comprehensive and integral component of holistic palliative care.

Limitations and Future Directions

Despite its strong clinical and statistical outcomes, several limitations of this study must be acknowledged. First, the use of a quasi-experimental, single-group design without a control group limits the ability to control for history or maturation threats, meaning external clinical changes could have influenced the outcomes. Second, the sample size (n = 30) was drawn from a single healthcare facility via consecutive sampling, which restricts the generalizability of the findings to broader palliative populations.

https://doi.org/10.56303/jhnresearch.v5i2.1530

Lastly, the study evaluated immediate post-intervention outcomes without long-term follow-up assessments, leaving the durability of the MBN effects unmeasured. Future research should utilize multi-center randomized controlled trials (RCTs) with extended follow-up periods to confirm these findings and evaluate the long-term sustainability of nursing-led mindfulness protocols in palliative medicine.

CONCLUSION

This study demonstrates that a structured Mindfulness-Based Nursing (MBN) intervention significantly reduces anxiety and improves the quality of life (QoL) of cancer patients undergoing palliative care. The statistically significant changes observed between baseline and post-intervention scores ($p < 0.001$), combined with a large clinical effect size (Cohen's $d = 1.20$), establish that this nurse-led modality effectively mitigates psychological distress and enhances overall well-being. These findings reinforce the value of integrating structured, clinician-guided mindfulness protocols as an empirical, non-pharmacological supportive strategy to address the complex emotional demands of advanced-stage oncology patients. The findings offer clear directives for palliative nursing care. Implementing the MBN framework provides an accessible, low-risk, and cost-effective bedside intervention that enables clinicians to actively support patient emotional regulation, alleviate acute anxiety, and improve perceived QoL. To optimize these outcomes at the institutional level, nursing curriculum and hospital training protocols should incorporate specialized competencies in mindfulness-based psychosocial care. Practically, the standardized six-session protocol utilized in this research can serve as a baseline model for developing operational, patient-centered nursing guidelines within palliative units..

DECLARATION OF THE USE OF AI

The authors declare that no artificial intelligence (AI), AI-assisted technologies, or large language models (LLMs) were used in the conception of the study, data analysis, or the drafting, writing, and editing of this manuscript. The only exception is the graphical abstract, which was created using the design platform Illustrae (https://illustrae.co/). The authors take full responsibility for the content and accuracy of the graphical abstract and the entire manuscript.

FUNDING

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

ACKNOWLEDGMENTS

The authors express their sincere gratitude to all the patients and their families who voluntarily participated in this study despite their challenging health circumstances. We also highly appreciate the administrative support and cooperation provided by the clinical directors and nursing staff at the palliative care facility in Bogor, Indonesia, which made the implementation of the Mindfulness-Based Nursing Intervention (MBNI) protocol possible. Finally, we thank the research assistants and institutional colleagues who provided technical assistance during data collection and statistical verification.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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https://doi.org/10.56303/jhnresearch.v5i2.1530