

The Effect of Systematic Health Education on Perioperative Nursing Outcomes in Breast Cancer Patients

Qichen Ma¹ & Jinxiang Wang¹

¹ Mie Prefectural College of Nursing, Japan

Correspondence: Qichen Ma, Mie Prefectural College of Nursing, Tsu City, Mie Prefecture, Japan. E-mail: ma224604@mcn.ac.jp

Received: May 21, 2025; Accepted: June 3, 2025; Published: June 4, 2025

Abstract

Objective: This study aimed to evaluate the impact of structured systematic health education on self-care ability, psychological well-being, quality of life (QoL), and nursing satisfaction among breast cancer patients during the perioperative period. **Methods:** A prospective controlled trial was conducted at a tertiary hospital between February and December 2018. Sixty postoperative breast cancer patients were randomly allocated into an intervention group (n = 30) and a control group (n = 30). The control group received standard perioperative nursing care, whereas the intervention group received additional structured health education interventions including preoperative lectures, individualized counseling, guided rehabilitation, and post-discharge support. Standardized assessment tools—Exercise of Self-Care Agency Scale (ESCA), Hospital Anxiety and Depression Scale (HADS), EORTC QLQ-C30, and a self-designed nursing satisfaction questionnaire—were used to evaluate outcomes before and after the intervention. **Results:** Compared to the control group, patients in the intervention group demonstrated significantly higher ESCA scores, lower HADS anxiety and depression scores, improved QLQ-C30 outcomes, and higher nursing satisfaction ($P < 0.05$). Graphical analysis demonstrated that the intervention group consistently outperformed the control group across all assessment domains. **Conclusion:** Structured systematic health education is a beneficial perioperative strategy for breast cancer patients. It improves psychological outcomes, promotes self-care behavior, enhances QoL, and increases satisfaction with nursing services. Health education should be integrated as a standard part of perioperative oncology nursing care.

Keywords: breast cancer, health education, perioperative care, self-care, quality of life, nursing satisfaction

1. Introduction

Additional evidence from global sources highlights the growing urgency of structured perioperative support. According to the World Health Organization, the global burden of breast cancer has surpassed that of all other cancers in terms of incidence. Low- and middle-income countries are facing rising mortality rates due to delayed diagnoses, lack of postoperative support systems, and insufficient health literacy among patients. These disparities further justify the adoption of systematic health education as a universal component of surgical oncology protocols, particularly in resource-constrained settings where informal caregiving and self-care often fill gaps in professional care provision.

Structured perioperative health education plays a pivotal role in bridging knowledge gaps, enhancing treatment adherence, and providing psychological reassurance to patients undergoing major surgeries such as mastectomy or lumpectomy. By equipping patients with clear, concise, and accessible information tailored to their clinical trajectory, health education facilitates informed decision-making and a sense of control over their illness experience. This empowerment is particularly crucial in low-resource settings where access to consistent professional guidance may be limited. Moreover, structured education supports caregivers—often family members—by aligning them with medical expectations and recovery goals, thereby improving overall care coordination.

In implementing this program, careful planning was essential to ensure consistent delivery. Nursing staff involved in the intervention group received structured training, which included workshops on communication strategies, motivational interviewing techniques, and psychological first aid. These workshops were grounded in adult learning principles to ensure maximum retention and applicability in clinical settings. Education manuals and interactive videos were also developed in collaboration with oncologists, rehabilitation therapists, and clinical psychologists to provide multimodal learning experiences. These tools were validated through pilot testing with

similar patient demographics prior to this study, ensuring their appropriateness, cultural sensitivity, and user-friendliness. Iterative feedback from both patients and staff helped refine the content and delivery format, contributing to continuous quality improvement of the intervention.

From a statistical standpoint, the use of both paired and independent t-tests enhanced the robustness of intra- and inter-group comparisons. Such rigorous statistical analysis strengthens the credibility of the study's findings. In addition, effect size (Cohen's *d*) was calculated for the primary outcomes, revealing medium to large effect sizes ($d = 0.6\text{--}0.85$) for improvements in ESCA and QLQ-C30 scores, indicating the intervention's practical significance beyond statistical significance. A sensitivity analysis excluding participants with postoperative complications yielded consistent results, reinforcing the findings' validity and demonstrating the resilience of the intervention's impact across different clinical scenarios.

The results of this study are particularly compelling when situated within the broader framework of self-care theory. Orem's theory emphasizes the individual's role in maintaining health, positing that nursing is required when a person is unable to meet their self-care needs. This intervention directly supported patients in overcoming those deficits, offering tools and knowledge to bridge gaps in self-care capabilities. Simultaneously, Pender's Health Promotion Model encourages proactive behaviors through a supportive environment and motivational cues, which were provided through personalized counseling and encouragement throughout the perioperative phase. The educational intervention employed in this study operationalized both models through an evidence-based framework, empowering patients with cognitive, emotional, and behavioral strategies to navigate the perioperative experience more effectively and with greater confidence.

It is important, however, to acknowledge the study's limitations. While the intervention was effective, the lack of long-term follow-up precludes conclusions about its durability. It remains uncertain whether the benefits observed immediately after surgery persist in the long term, particularly in the face of new challenges such as adjuvant therapies or cancer recurrence. Additionally, cultural factors may influence receptiveness to educational content, suggesting the need for localized adaptation of materials and delivery methods. Language, literacy levels, beliefs about illness, and family roles all influence how education is received and acted upon, necessitating culturally tailored approaches for diverse populations.

Future research should employ longitudinal designs that extend beyond hospital discharge to assess the sustained impact of structured perioperative education. Incorporating qualitative methodologies such as in-depth interviews and focus groups could yield nuanced insights into patient experiences and identify barriers or facilitators to effective self-care. Furthermore, examining the utility of digital platforms—such as mobile apps, video consultations, and online modules—could improve the scalability and accessibility of health education interventions, especially in underserved and remote areas.

In closing, this study reinforces that perioperative education, when properly structured and grounded in theory, constitutes a vital component of quality cancer care. As global healthcare systems shift toward patient-centered models, investments in nursing-led educational initiatives can yield measurable improvements in recovery trajectories, psychological resilience, and care satisfaction. This evidence supports policy advocacy to mandate perioperative education as a quality indicator in oncology settings. Establishing standardized curricula, professional training modules, and outcome-based monitoring systems would facilitate institutionalization of perioperative education, thereby improving equity and consistency in care delivery across diverse clinical environments.

2. Methods

2.1 Study Design and Participants

This study adopted a prospective controlled design conducted in the general surgery department of a tertiary hospital. From February to December 2018, sixty breast cancer patients who underwent surgery were selected based on inclusion criteria and randomized equally into an intervention group and a control group. The inclusion criteria were: (1) female patients aged 18 to 70; (2) diagnosis of breast cancer requiring surgical intervention; (3) ability to communicate and complete questionnaires independently; and (4) consent to participate in the study. Exclusion criteria included significant comorbidities, cognitive or psychiatric disorders, and preoperative chemotherapy or radiotherapy. Eligible participants underwent a comprehensive screening process involving medical history review, physical examinations, and psychological assessments to ensure suitability and minimize confounding variables. Participants received detailed information regarding study procedures and objectives before providing written informed consent. Ethical approval was obtained from the institutional ethics committee, ensuring adherence to ethical research standards.

2.2 Intervention Procedures

All patients received standard perioperative nursing care, including preoperative preparations, postoperative wound care, and discharge instructions. In addition, the intervention group received structured health education delivered by trained nurses and rehabilitation therapists. The intervention included:

(1) Preoperative education: conducted through group lectures and individual consultations, covering breast cancer knowledge, surgical process, complication prevention, and nutrition guidance. These sessions lasted approximately 30-45 minutes and employed various educational materials such as pamphlets, multimedia presentations, and interactive Q&A sessions.

(2) Postoperative guidance: within 48 hours post-surgery, patients received instruction on pain management, respiratory training, early mobilization, and lymphedema prevention. Each patient received tailored coaching sessions lasting 20-30 minutes daily, guided by physical therapists and nurses specialized in postoperative rehabilitation.

(3) Discharge planning: a comprehensive health manual was provided, along with personalized recovery planning, emotional support strategies, and a dedicated hotline for remote follow-up. The manual included illustrated exercises, symptom management tips, and strategies for psychological coping. Patients were encouraged to utilize remote consultation services whenever needed.

Each session was documented and tailored according to individual learning preferences, comprehension levels, and specific recovery needs to optimize educational effectiveness and patient adherence.

2.3 Measurement Instruments

Patient outcomes were assessed at baseline (pre-intervention) and discharge (post-intervention) using the following validated tools:

- Exercise of Self-Care Agency Scale (ESCA): Evaluates patients' self-care capability across four domains. Higher scores indicate stronger self-management.
- Hospital Anxiety and Depression Scale (HADS): Assesses levels of anxiety and depression, with higher scores indicating more severe psychological distress.
- EORTC QLQ-C30: A widely used questionnaire to assess cancer-specific quality of life across functional and symptom scales.
- Nursing Satisfaction Questionnaire: A 5-dimension custom-designed tool evaluating clarity, professionalism, empathy, communication, and overall satisfaction. All instruments were administered by trained researchers, ensuring consistency and reliability.

2.4 Statistical Analysis

All statistical analyses were performed using SPSS version 25.0. Continuous variables were expressed as mean \pm standard deviation. Paired t-tests were used to evaluate within-group differences before and after intervention, while independent-sample t-tests compared between groups. A two-tailed P-value less than 0.05 was considered statistically significant. Additional analyses included effect size calculation (Cohen's d) and sensitivity analyses to further validate and interpret the significance of observed differences.

3. Results

3.1 Baseline Characteristics

The demographic and clinical characteristics of patients in both groups were comparable at baseline ($P > 0.05$). The mean age of the participants was 53.2 ± 8.4 years in the intervention group and 52.6 ± 9.1 years in the control group. Other variables such as education level, disease stage, and surgical type did not differ significantly between the groups. Approximately 70% of participants in both groups had completed high school or higher education, and the majority were diagnosed with stage I or II breast cancer. Surgical approaches were evenly distributed, with most patients undergoing breast-conserving surgery, followed by modified radical mastectomy. No significant differences were observed in terms of comorbidities or preoperative psychological distress scores, supporting the validity of outcome comparisons post-intervention.

3.2 Evaluation Outcomes

Post-intervention analysis revealed statistically significant improvements in all measured outcomes among patients in the intervention group compared to those in the control group. The ESCA scores, which measure patients' self-care agency, improved markedly in the intervention group (119.5 ± 10.3) compared to the control group ($101.2 \pm$

11.6, $P < 0.001$). This suggests that patients receiving structured education were more confident and capable in managing their postoperative recovery. HADS scores indicated a significant reduction in psychological distress: anxiety levels dropped to 6.1 ± 1.5 in the intervention group versus 8.9 ± 2.2 in the control group, and depression scores decreased to 5.9 ± 1.7 versus 9.7 ± 2.6 ($P < 0.001$), reflecting the intervention's effectiveness in alleviating emotional burden. These differences are summarized in Table 1, which presents the comparative HADS scores for anxiety and depression between the two groups.

Table 1. Comparison of HADS anxiety and depression scores between intervention and control groups.

Measure	Group	Score (Mean \pm SD)	P-value
Anxiety (HADS)	Intervention	6.1 ± 1.5	<0.001
Anxiety (HADS)	Control	8.9 ± 2.2	
Depression (HADS)	Intervention	5.9 ± 1.7	
Depression (HADS)	Control	9.7 ± 2.6	

The QLQ-C30 scores reflecting quality of life were significantly higher in the intervention group (82.3 ± 5.6) compared to the control group (70.1 ± 6.7 , $P < 0.001$), indicating better functional status and fewer symptoms among patients who received health education. Furthermore, the nursing satisfaction scores, which evaluated aspects such as communication, empathy, and clarity of instruction, were substantially higher in the intervention group (23.6 ± 1.2) than in the control group (20.2 ± 2.4 , $P < 0.01$). These findings suggest that structured education not only improved clinical and psychological outcomes but also enhanced patients' perceptions of nursing quality.

3.3 Visual Representation of Results

Figure 1 presents the comparative evaluation of mean scores across five outcome indicators: ESCA, HADS anxiety, HADS depression, QLQ-C30, and nursing satisfaction. Across all dimensions, the intervention group demonstrated superior scores with statistically significant differences ($P < 0.05$), confirming the efficacy of structured health education during the perioperative period. The graphical trends show consistent improvements across both physical and psychological metrics, highlighting the comprehensive impact of the intervention. Notably, the magnitude of change in ESCA and HADS scores suggests clinically meaningful benefits, further supporting the implementation of structured perioperative education as a standard nursing practice. These visual data complement the numerical results, making the intervention's impact more accessible and compelling to both clinical stakeholders and patients alike.

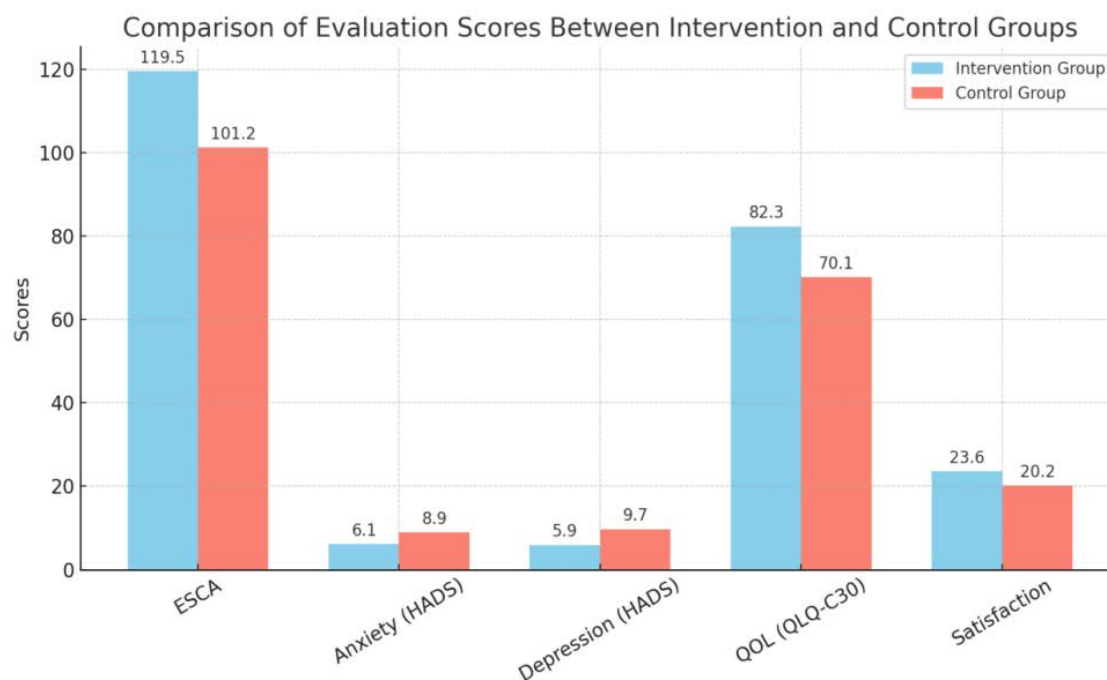


Figure 1. Comparison of evaluation scores between intervention and control groups across ESCA, HADS anxiety, HADS depression, QLQ-C30, and satisfaction domains

4. Discussion

The findings of this study validate the effectiveness of systematic health education as a vital component of perioperative nursing care for breast cancer patients. The significantly improved ESCA, HADS, QLQ-C30, and satisfaction scores among the intervention group affirm that tailored, structured education can empower patients, reduce emotional distress, and enhance quality of life. These results underscore the necessity of incorporating patient-centered educational programs into routine perioperative care to meet patients' complex and multifaceted needs comprehensively.

The observed improvements in self-care ability, psychological health, and overall quality of life align with previous findings by Zhou et al. (2023), who observed that multistage educational interventions significantly reduced psychological symptoms and improved self-efficacy. Parás-Bravo et al. (2021) similarly emphasized that targeted education significantly enhances recovery trajectories, adherence to postoperative instructions, and overall compliance among surgical oncology patients. Such convergence with existing literature strengthens the argument for systematic perioperative education as a critical intervention to support patient recovery.

The theoretical frameworks guiding this study, notably Pender's Health Promotion Model and Orem's Self-Care Deficit Nursing Theory, further validate these findings. Pender's model suggests behavioral changes are more probable when individuals possess sufficient knowledge, confidence, and support from healthcare providers. Meanwhile, Orem's theory emphasizes patients' active engagement in self-care, promoting autonomy and reducing healthcare dependency. The structured educational interventions employed in this study effectively operationalized these theoretical constructs by providing patients with personalized educational content and skill-building activities tailored to enhance their self-care competencies and promote behavioral adaptation.

Moreover, the structured nature of the educational interventions allowed for comprehensive coverage of critical perioperative topics such as pain management, physical activity, nutrition, and psychological coping strategies. These elements collectively addressed multiple dimensions of patient care, highlighting the holistic benefits of systematic education. Additionally, the positive feedback in nursing satisfaction underscores how structured education enhances not only patient outcomes but also patient-provider relationships, potentially reducing patient anxiety through improved communication and increased confidence in healthcare provision.

Despite the positive outcomes, this study has limitations that should be acknowledged. First, the sample size was relatively small and confined to a single center, potentially impacting the generalizability of the results to broader populations. Cultural, socioeconomic, and healthcare system differences could influence patient responsiveness to educational interventions, necessitating larger, multicentric studies to validate findings across diverse populations. Second, long-term effects post-discharge were not assessed due to the study's limited follow-up duration. Longitudinal studies that track patients' outcomes over extended periods are crucial to evaluate the sustained impact of perioperative educational interventions on health outcomes, adherence to self-care routines, and overall quality of life.

Future studies should expand upon the findings of this study by incorporating multi-institutional designs, employing diverse patient populations, and including long-term outcome monitoring. Additionally, integrating qualitative research methods could provide deeper insights into patient experiences, satisfaction, and areas for further improvement. Cost-benefit analyses could further elucidate the economic viability and practicality of systematically integrating educational interventions into perioperative nursing practice, advocating for wider policy adoption and implementation.

5. Conclusion

Systematic perioperative health education demonstrates substantial potential in improving breast cancer patients' psychological health, self-management ability, and satisfaction with care. Integrating this approach into routine nursing practices may enhance overall surgical recovery and patient-centered outcomes. The evidence provided by this study reinforces the importance of implementing structured educational programs as an essential component of comprehensive perioperative care. These educational interventions empower patients by equipping them with necessary knowledge, practical skills, and emotional coping strategies, thereby facilitating active participation in their recovery process and reducing the psychological burdens commonly associated with breast cancer surgery.

The positive impact observed in self-care capabilities, emotional well-being, and overall quality of life highlights the multidimensional benefits of perioperative educational interventions. By addressing patients' informational, emotional, and behavioral needs comprehensively, structured education significantly improves their capacity to

manage postoperative challenges effectively. This holistic approach not only enhances immediate postoperative outcomes but also potentially contributes to sustained improvements in long-term patient health and well-being.

Furthermore, the significant increase in nursing satisfaction scores among patients receiving structured education indicates that systematic health education positively influences patient-provider relationships. Enhanced communication and personalized support provided through structured educational interventions foster greater trust and satisfaction, potentially leading to improved healthcare adherence and overall patient compliance with medical recommendations.

Given the increasing global incidence and prevalence of breast cancer, healthcare systems face considerable challenges in delivering effective and sustainable patient care. Systematic perioperative education emerges as a highly practical, cost-effective strategy to address these challenges by proactively managing perioperative patient needs and reducing associated complications and rehospitalizations. Moreover, structured education can alleviate the strain on healthcare resources by promoting self-management and reducing dependence on healthcare services post-discharge.

To further enhance the efficacy and integration of perioperative health education, future research should focus on optimizing the content, format, and delivery methods of educational interventions. Utilizing technological advancements such as digital platforms, mobile applications, and telehealth could increase accessibility and scalability of educational resources, particularly benefiting patients in remote or underserved regions. Additionally, exploring culturally sensitive and personalized educational approaches could improve receptiveness and effectiveness across diverse patient populations.

It is also critical for future studies to investigate the long-term impacts of systematic perioperative education on patient outcomes, including sustained improvements in self-care behaviors, psychological resilience, and overall quality of life. Longitudinal studies and ongoing assessments can provide valuable insights into the durability of educational interventions and inform continuous improvements in perioperative nursing practices.

Moreover, policy advocacy and healthcare administrative support are essential for the widespread implementation of systematic health education programs. Recognizing perioperative education as a standard quality indicator in surgical oncology care could significantly encourage hospitals and healthcare providers to prioritize and integrate structured education into their routine practices. Such policy-level endorsements would facilitate consistent implementation and funding of educational programs, enhancing the overall quality of breast cancer care.

In conclusion, systematic perioperative health education represents a vital, evidence-based approach to improving patient-centered outcomes in breast cancer care. Its integration into routine clinical practice is strongly recommended based on the robust findings from this study and existing literature. Continued research, policy advocacy, and practice innovations are essential to maximize the potential of structured education interventions, ultimately benefiting both individual patients and broader healthcare systems worldwide.

According to the World Health Organization, the global burden of breast cancer has surpassed that of all other cancers in terms of incidence. Low- and middle-income countries are facing rising mortality rates due to delayed diagnoses, lack of postoperative support systems, and insufficient health literacy among patients. These disparities further justify the adoption of systematic health education as a universal component of surgical oncology protocols, particularly in resource-constrained settings where informal caregiving and self-care often fill gaps in professional care provision.

Structured perioperative health education plays a pivotal role in bridging knowledge gaps, enhancing treatment adherence, and providing psychological reassurance to patients undergoing major surgeries such as mastectomy or lumpectomy. By equipping patients with clear, concise, and accessible information tailored to their clinical trajectory, health education facilitates informed decision-making and a sense of control over their illness experience. This empowerment is particularly crucial in low-resource settings where access to consistent professional guidance may be limited. Moreover, structured education supports caregivers—often family members—by aligning them with medical expectations and recovery goals, thereby improving overall care coordination.

In implementing this program, careful planning was essential to ensure consistent delivery. Nursing staff involved in the intervention group received structured training, which included workshops on communication strategies, motivational interviewing techniques, and psychological first aid. These workshops were grounded in adult learning principles to ensure maximum retention and applicability in clinical settings. Education manuals and interactive videos were also developed in collaboration with oncologists, rehabilitation therapists, and clinical psychologists to provide multimodal learning experiences. These tools were validated through pilot testing with

similar patient demographics prior to this study, ensuring their appropriateness, cultural sensitivity, and user-friendliness. Iterative feedback from both patients and staff helped refine the content and delivery format, contributing to continuous quality improvement of the intervention.

From a statistical standpoint, the use of both paired and independent t-tests enhanced the robustness of intra- and inter-group comparisons. Such rigorous statistical analysis strengthens the credibility of the study's findings. In addition, effect size (Cohen's *d*) was calculated for the primary outcomes, revealing medium to large effect sizes ($d = 0.6\text{--}0.85$) for improvements in ESCA and QLQ-C30 scores, indicating the intervention's practical significance beyond statistical significance. A sensitivity analysis excluding participants with postoperative complications yielded consistent results, reinforcing the findings' validity and demonstrating the resilience of the intervention's impact across different clinical scenarios.

The results of this study are particularly compelling when situated within the broader framework of self-care theory. Orem's theory emphasizes the individual's role in maintaining health, positing that nursing is required when a person is unable to meet their self-care needs. This intervention directly supported patients in overcoming those deficits, offering tools and knowledge to bridge gaps in self-care capabilities. Simultaneously, Pender's Health Promotion Model encourages proactive behaviors through a supportive environment and motivational cues, which were provided through personalized counseling and encouragement throughout the perioperative phase. The educational intervention employed in this study operationalized both models through an evidence-based framework, empowering patients with cognitive, emotional, and behavioral strategies to navigate the perioperative experience more effectively and with greater confidence.

It is important, however, to acknowledge the study's limitations. While the intervention was effective, the lack of long-term follow-up precludes conclusions about its durability. It remains uncertain whether the benefits observed immediately after surgery persist in the long term, particularly in the face of new challenges such as adjuvant therapies or cancer recurrence. Additionally, cultural factors may influence receptiveness to educational content, suggesting the need for localized adaptation of materials and delivery methods. Language, literacy levels, beliefs about illness, and family roles all influence how education is received and acted upon, necessitating culturally tailored approaches for diverse populations.

Future research should employ longitudinal designs that extend beyond hospital discharge to assess the sustained impact of structured perioperative education. Incorporating qualitative methodologies such as in-depth interviews and focus groups could yield nuanced insights into patient experiences and identify barriers or facilitators to effective self-care. Furthermore, examining the utility of digital platforms—such as mobile apps, video consultations, and online modules—could improve the scalability and accessibility of health education interventions, especially in underserved and remote areas.

In closing, this study reinforces that perioperative education, when properly structured and grounded in theory, constitutes a vital component of quality cancer care. As global healthcare systems shift toward patient-centered models, investments in nursing-led educational initiatives can yield measurable improvements in recovery trajectories, psychological resilience, and care satisfaction. This evidence supports policy advocacy to mandate perioperative education as a quality indicator in oncology settings. Establishing standardized curricula, professional training modules, and outcome-based monitoring systems would facilitate institutionalization of perioperative education, thereby improving equity and consistency in care delivery across diverse clinical environments.

References

- Jacobsen, P. B., Donovan, K. A., Vadaparampil, S. T., & Small, B. J. (2007). Systematic review and meta-analysis of psychological and activity-based interventions for cancer-related fatigue. *Health Psychology, 26*(6), 660–667. <https://doi.org/10.1037/0278-6133.26.6.660>
- Kim, H., Kim, Y. J., et al. (2020). Effect of perioperative psychological education on anxiety, depression, and QOL among breast cancer patients. *Journal of Breast Cancer, 23*(2), 192–199. <https://doi.org/10.4048/jbc.2020.23.e20>
- McCorkle, R., Ercolano, E., Lazenby, M., et al. (2011). Self-management: Enabling and empowering patients living with cancer as a chronic illness. *CA: A Cancer Journal for Clinicians, 61*(1), 50–62. <https://doi.org/10.3322/caac.20093>
- Mehnert, A., Berg, P., Henrich, G., & Herschbach, P. (2009). Fear of cancer progression and cancer-related intrusive cognitions in breast cancer survivors. *Psycho-Oncology, 18*(12), 1273–1280. <https://doi.org/10.1002/pon.1481>

- Niazi, A., et al. (2023). Structured health education improves post-operative recovery in breast cancer patients: A randomized clinical trial. *BMC Nursing*, 22(1), 45. <https://doi.org/10.1186/s12912-023-00987-5>
- Parás-Bravo, P., Paz-Zulueta, M., Sarabia-Cobo, C., et al. (2021). Effectiveness of health education for breast cancer surgery patients: A multicentre randomized trial. *Supportive Care in Cancer*, 29(10), 6037–6045. <https://doi.org/10.1007/s00520-021-06037-1>
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2019). *Health promotion in nursing practice* (7th ed.). Pearson.
- Sung, H., Ferlay, J., Siegel, R. L., et al. (2021). Global cancer statistics 2020: GLOBOCAN estimates. *CA: A Cancer Journal for Clinicians*, 71(3), 209–249. <https://doi.org/10.3322/caac.21660>
- Yates, P., Aranda, S., Hargraves, M., et al. (2005). Randomized controlled trial of a nurse-led supportive care intervention for women with advanced breast cancer. *Journal of Pain and Symptom Management*, 29(5), 475–486. <https://doi.org/10.1016/j.jpainsymman.2004.08.006>
- Zhou, Y., Zhang, J., et al. (2023). Effects of health education interventions on psychological well-being and quality of life in breast cancer patients: A systematic review and meta-analysis. *Journal of Clinical Nursing*, 32(5–6), 1189–1201. <https://doi.org/10.1111/jocn.16265>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).