

Tele-nursing care based on Rozzano Locsin theory of technological competency in breast cancer patients

 Nisa Yavuzer Bayrak¹,  Elanur Yılmaz Karabulutlu²

¹Department of Nursing, Semra ve Vefa Küçük Faculty of Health Sciences, Nevşehir Hacı Bektaş Veli University, Nevşehir, Türkiye

²Department of Internal Medicine Nursing, Faculty of Nursing, Atatürk University, Erzurum, Türkiye

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ABSTRACT

Breast cancer is among the most common malignant diseases in women, necessitating multidisciplinary approaches in its diagnosis, treatment, and care processes. Nursing care plays a critical role in meeting the physical, psychological, and social needs of patients. Nursing interventions, supported by individualized care plans, are pivotal for early diagnosis, treatment adherence, and enhancing quality of life. Technological advancements today are transforming both diagnostic and care processes in breast cancer management. Tele-nursing applications facilitate the monitoring of patients during their treatment, make education and counseling services more accessible, and ensure the continuity of care. These approaches support patients in receiving safe and effective care within their home environments, thereby reducing inequalities in access to healthcare services. Rozzano Locsin's theory of technological competency as caring in nursing emphasizes that nurses can enhance their capacity to provide care by using technology consciously and competently. According to the theory, nurses can improve patient safety and the quality of care by developing their skills in using technological tools. Tele-nursing initiatives exemplify the practical application of this theory; through remote monitoring systems, digital education platforms, and tele-consultations, nurses can offer patients effective, safe, and personalized care. This review summarizes current approaches in the literature by examining the importance of technology and tele-nursing applications in breast cancer care within the framework of a nursing theory. Nursing interventions based on technological competency enhance the quality of patient-centered care and provide a foundation for developing future strategies in breast cancer management.

Keywords: Breast cancer, tele nursing, Rozzano Locsin theory of technological competency

INTRODUCTION

Breast cancer is the malignancy with the highest incidence among women worldwide and remains a critical health issue due to its impact on both quality of life and mortality.¹ Advances in health technologies have improved diagnostic and treatment processes, contributing to longer life expectancies and expanded treatment options. The technological integration of artificial intelligence applications used for diagnosis facilitates rapid detection and accelerates intervention.^{2,3} The theranostic approach, which has recently gained prominence in breast cancer management, integrates the diagnostic process with treatment strategies and enables the selection of targeted therapies based on the tumor's specific biological characteristics through advanced imaging and molecular profiling techniques.^{3,4} Technologies that enable personalized treatment and care in the post-breast cancer process have been shown to make significant contributions to meeting the emotional and psychological needs of patients.^{5,6}

The responsibilities of nurses in breast cancer care have diversified with the innovations offered by technology, increasing the effectiveness of patient care. These roles

encompass a wide spectrum, from information and education activities to clinical practices, and from emotional support to logistical coordination.^{7,8} The integration of digital health technologies into nursing practices has paved the way for innovative methods in nurse-patient interactions with breast cancer patients, thereby elevating the quality of nursing care and adding a new dimension to clinical applications.⁷⁻⁹

The psychosocial and emotional support provided by nurses holds a decisive place in the holistic approach to breast cancer treatment, which is not limited to its biomedical aspects alone. This support plays a critical role, especially in coping with the stress, anxiety, and uncertainty caused by a cancer diagnosis.¹⁰ Through technological solutions, nurses can organize patient appointments and provide a secure communication environment where patients can share their anxieties. Thus, continuous psychological support increases treatment adherence and strengthens patient satisfaction. This clearly demonstrates the necessity for nurses to be at the center of breast cancer care.^{11,12} By providing logistical management in breast cancer care processes, nurses contribute to patients'

Corresponding Author: Nisa Yavuzer Bayrak, nisayavuzer@hotmail.com



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efficient navigation within the healthcare system. Tasks such as treatment coordination and prescription management enhance the practicality of care, while technologies like electronic health records and data analytics optimize processes and increase patient satisfaction.¹³

Technological developments necessitate the integration of care processes with technology in nursing applications. The 'technological competency as caring in nursing' theory, which emerged in this context, is considered a relatively new theoretical approach in nursing literature.^{14,15} The Theory of Technological Competency as Caring in Nursing (TCTN), introduced by Rozzano Locsin in 2005, can be defined as an approach that combines the main components of care in nursing practice with technological proficiency. According to this theory, various technological tools used in healthcare should complement human care and enable nurses to deliver effective care using technology. The aim of technological competency in nursing, according to the theory, is to position the patient as the focal point of the care process and to consciously utilize technological tools in the processes of defining the individual through nursing interventions.^{14,16}

Tele-nursing is a practice that aims to improve patient care by using communication technologies in nursing, aligning with the theory of technological competency.¹⁷ It has been demonstrated that tele-nursing applications yield positive outcomes for patients. Tele-nursing methods such as messaging, phone calls, video consultations, and mobile-based educational applications have been found to facilitate patients' access to healthcare services, strengthen patient-healthcare professional communication, develop patient education and self-management skills, and lead to improvements in overall health outcomes.¹⁸⁻²¹

This review was prepared to highlight the importance of telehealth applications in meeting the current needs of nursing care for breast cancer patients and to demonstrate how Rozzano Locsin's theory of technological competency can provide guidance in this context. Today, tele-nursing applications play a critical role in strengthening the interaction between patient and nurse and ensuring the continuity of care. However, preserving the humanistic dimension of technology in this care process and providing holistic support to the patient requires examination in relation to nursing theories. Accordingly, this article will discuss how the aforementioned theory can be integrated into tele-nursing care for breast cancer patients and will evaluate the existing literature on patient safety, quality of life, empathetic communication, and the use of technology in nursing.

BREAST CANCER AND NURSING CARE

Breast cancer, the most common malignancy characterized by the uncontrolled proliferation of cells in the breast tissue, is one of the leading types of cancer seen among adults. As of the end of 2020, 7.8 million women had been diagnosed with breast cancer in the preceding five years, making it the world's most prevalent cancer.^{1,22} Advances in early diagnosis and treatment methods have significantly increased survival rates, leading to breast cancer being considered a disease requiring long-term monitoring, similar to a chronic illness.

Consequently, as with chronic diseases, there is a need for long-term follow-up and care for individuals with breast cancer.²³

In breast cancer care, nurses play a significant role by providing holistic physical, psychosocial, and educational support to patients. The implementation of current care models and evidence-based interventions contributes to improving patient outcomes and enhancing quality of life. In this context, the continuous professional development and learning efforts of nurses are among the fundamental elements that increase the effectiveness of breast cancer care.^{7,24}

Breast cancer patients experience physical and psychosocial problems stemming from both the disease itself and the side effects of the treatment process.²⁵ In this regard, the importance of nursing initiatives in providing physical, psychological, and emotional support, as well as practical advice to patients during the diagnosis and treatment process, is increasing.²⁶ The systematic assessment and control of symptoms contribute to improving the quality of care and ensuring the provision of sustainable, high-quality care. To understand the side effects and symptoms of cancer treatment, it is necessary to conduct the nursing process based on reliable and valid evidence to plan and implement appropriate nursing interventions. In the nursing process, it is important to achieve treatment goals, maintain the physical and psychological well-being of patients, support adequate nutrition, and empower them psychosocially.^{25,27}

A systematic review of randomized controlled trials examining the effects of interventions by specialist breast cancer nurses found a significant improvement in quality of life, a reduction in anxiety and depression levels, and an increase in patient satisfaction.²⁸ Similar studies in the literature also demonstrate that specialist nursing interventions have significant effects on the health outcomes of breast cancer patients. Indeed, according to the findings of systematic reviews, interventions applied by specialist nurses not only contribute to alleviating physical symptoms but also provide substantial support for increasing psychosocial adjustment, strengthening treatment adherence, and improving quality of life. These results reveal that developing nursing practices in line with evidence-based approaches can create positive outcomes in patient care.^{24,28}

THE BENEFITS OF TECHNOLOGY IN BREAST CANCER MANAGEMENT AND THE IMPORTANCE OF TELE-NURSING APPLICATIONS

In recent years, parallel to the proliferation of online platforms, various web-based and mobile health interventions have been developed to support the self-management skills of breast cancer patients.²⁹⁻³² Compared to traditional care models, the fact that mobile health applications are independent of time and space limitations increases the ease of use of these interventions. This allows for the delivery of healthcare services in a more accessible, continuous, and effective manner.^{30,33}

According to the definition by the International Council of Nurses (ICN), tele-nursing refers to the effective use of

communication and information technologies in nursing practice to enhance patient care processes.¹⁷ More recent definitions in the literature describe tele-nursing as the process of remotely and continuously monitoring patients' health status, providing care, and delivering necessary support services through telecommunication technologies. In this context, tele-nursing is considered a holistic care approach that encompasses not only the transfer of information and data but also patients' health management, education, and counseling processes. Furthermore, tele-nursing applications overcome geographical constraints, thereby increasing equity in access to healthcare services and contributing to the sustainability of care quality.³⁴

Communication via telephone is one of the education and follow-up strategies applied by nurses in cancer care. This approach, in addition to providing low-cost supportive care, strengthens the relationship between the patient and the healthcare professional and stands out as an effective method for reducing time and space constraints in accessing cancer care. Moreover, telephone communication reduces hospitalization rates, improves patient education, supports individuals' self-management skills, and thus contributes to increasing the quality of patient care.^{29,35,36}

THEORY OF TECHNOLOGICAL COMPETENCY AS CARING

The theory of technological competency as caring, developed by Rozzano Locsin, offers an innovative framework based on the masterful use of technology to ensure a deep understanding of individual care in nursing practice and the effective delivery of patient-centered care. This theory enables nurses to embrace technology not merely as a tool but as a component that strengthens the care process, thereby contributing to the realization of human-focused, high-quality care in modern healthcare services.¹⁴

Adopting a patient-centered approach, the theory treats nursing as both a discipline of knowledge and an applied profession, offering an integrated approach to care and technology.³⁷ Within this framework, the patient ceases to be a passive object in the care process and becomes a subjective individual actively participating in their own care. Nurses, while planning and implementing the care process, evaluate the patient from a holistic perspective, ensuring that every stage of care is tailored to the individual. Theoretically, it is accepted that every individual is unique, and it is emphasized that nursing practices should respect this uniqueness and provide personalized care.¹⁴

The effective use of technology to enhance quality in nursing care highlights the critical importance of nurses' technological competencies.³⁸ In this context, developing nurses' skills to understand, evaluate, and effectively apply technology in nursing interventions emerges as a primary requirement. Nursing education plays a central role in equipping nurses technologically and ensuring the effective use of technology in healthcare services.³⁹ The literature emphasizes the decisive effects of technology on nursing education, clinical practices, and the improvement of care quality in technologically advanced healthcare environments.^{37,38}

Within the framework of the technological competency theory, the concepts of technology knowledge, mutual design, and participatory engagement stand out as fundamental components integrated into the nursing process. These concepts can emerge independently in nursing practice, or they can guide the process within a specific sequence or independent of any order. Thus, the guiding and integrative role of technology-based approaches in nursing practice comes to the forefront.³⁸

Technology knowledge is a significant tool in the process of monitoring and evaluating patients' conditions using health technologies. This approach offers considerable advantages in determining the care priorities that patients require.³⁸ Data obtained from technology enable the nurse to penetrate the patient's life experience and follow an effective and systematic path in planning person-specific care. However, the nurse must be aware that the information provided by technological tools may vary according to the patient's condition. Therefore, to actively involve the patient in their own care process and to increase the reliability of the obtained data, the nurse needs to integrate into the patient's daily life from a holistic perspective.³⁸

The mutual design process is considered an approach shaped by mutual interaction and collaboration, where the nurse and patient work together in planning care. Through this process, the nurse has the opportunity to know the patient from a multidimensional perspective, designing a unique and holistic care plan that considers not only the physical health status but also the psychological, social, and cultural needs.¹⁴

Participative engaging refers to the processes in which the patient and nurse are simultaneously and consciously involved to know the patient in-depth and to provide the most appropriate care. In this interaction process, the nurse actively integrates into the patient's life-world; the continuity of the interaction creates a consistent rhythm and structure in the planning, implementation, and evaluation of nursing interventions.¹⁴

TELE-NURSING INITIATIVES ACCORDING TO THE THEORY OF TECHNOLOGICAL COMPETENCY

In nursing care, theoretical concepts contribute to strengthening the patient-centered approach. Technology knowledge serves as a crucial tool for knowing, monitoring, and informing the patient. For instance, when a nurse utilizes mobile health applications or telehealth systems to record a patient's health data and provides information based on this data, the care process becomes both more reliable and more accessible. Mutual design, adapting to the dynamic nature of the care process, refers to the delivery of education and counseling not as a single event, but as multiple, individualized sessions. For example, a nurse providing periodic training tailored to the needs of an individual with a chronic illness ensures the continuity and personalization of care. Participatory engagement is central to the process; the mutual interaction between the patient and the nurse allows care to be shaped according to the patient's needs. This can

be conducted through teleconferencing, online counseling, or face-to-face meetings, overcoming the limitations of time and space. Thus, when nursing interventions are integrated with these theoretical concepts, they support the patient's active participation in the process and contribute to achieving the desired care outcomes.^{14,37,38}

CONCLUSION

Literature reviews indicate that technological advancements in breast cancer care not only support biomedical recovery but also make significant contributions to the individual's quality of life. However, it is understood that technology alone is not sufficient in patient care; the competency of nurses to integrate these tools with their care practice is of critical importance. In this context, Locsin's theory of technological competency as caring offers a strong theoretical framework, positioning technology not merely as a medical tool but as an integral part of the process of knowing and understanding the person. For instance, a nurse effectively using technology in port catheter monitoring or during radiotherapy processes for breast cancer care, while simultaneously understanding the patient's anxieties and evaluating their life experience from a holistic perspective, constitutes a concrete reflection of the theory in practice. This approach serves as a balancing element against the risk of technology "objectifying" the person, offering nurses an ethical and holistic roadmap.

In this direction, Locsin's theory should be integrated into nursing education programs; technological competency should be taught alongside a caring perspective, and courses, seminars, and simulation programs for breast cancer nursing should be organized. In clinical practice, the impact of technologies on the patient experience should be regularly evaluated, and care plans should be adapted accordingly; continuous support should be provided to patients through telehealth and digital counseling systems. In the field of research, the number of experimental and mixed-methods studies examining the effect of technological competency on nursing outcomes should be increased, as should qualitative research in Türkiye that reveals the practical applications of Locsin's theory.

ETHICAL DECLARATIONS

Referee Evaluation Process

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Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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