



Betty Neuman's Theory in Holistic Nursing Care for Cancer Patients: a reflective essay

Teoria de Betty Neuman no cuidado de enfermagem holístico ao paciente oncológico: ensaio reflexivo

La teoría de Betty Neuman en el cuidado holístico de enfermería al paciente con cáncer: un ensayo reflexivo

Tarcísio Tércio das Neves Júnior¹

Rafaella Guilherme Gonçalves¹

Maria Carolina Dantas Campelo Neves²

Jonas Sâmí Albuquerque de Oliveira¹

Rhayssa de Oliveira e Araújo¹

Rejane Maria Paiva de Menezes¹

1. Universidade Federal do Rio Grande do Norte, Programa de Pós-Graduação em Enfermagem. Departamento de Enfermagem. Natal, RN, Brazil.

2. Universidade Federal do Rio Grande do Norte, Programa de Pós-Graduação em Ciências Aplicadas à Saúde da Mulher. Natal, RN, Brazil.

Corresponding author:

Tarcísio Tércio das Neves Júnior.
E-mail: tarcisio.tercio@gmail.com

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ABSTRACT

Objective: To reflect on Betty Neuman's Systems Theory in holistic nursing care for cancer patients. **Method:** This is a reflective study originated from the study of the Systems Thinking/General Systems Theory paradigm by Ludwig von Bertalanffy based on discussions in a postgraduate nursing course, using Betty Neuman's Systems Theory as a framework. **Results:** Betty Neuman's Systems Model is a holistic nursing approach based on General Systems Theory. It emphasizes the assessment and approach of physical and psychosocial aspects that affect cancer patients' health. Focusing on prevention, promotion and system rehabilitation, it seeks to reduce stressors and maintain balance. The systemic perspective facilitates data collection and adequate actions. **Final considerations and implications for practice:** Cancer nursing care accounts for the impact of the disease and treatment not only on individual patients, but also on their families and communities, and society, demonstrating a systemic and holistic view in the approach to care.

Keywords: Holistic Nursing; Medical Oncology; Nursing; Nursing Care; Nursing Theory.

RESUMO

Objetivo: Refletir sobre a Teoria de Sistemas de Betty Neuman no cuidado holístico de enfermagem ao paciente oncológico. **Método:** Trata-se de um estudo reflexivo, originado a partir do estudo do paradigma do Pensamento Sistêmico/Teoria Geral dos Sistemas de Ludwig von Bertalanffy com base em discussões de uma disciplina de pós-graduação em enfermagem, tendo como referencial a Teoria dos Sistemas de Betty Neuman. **Resultados:** O Modelo de Sistemas de Betty Neuman é uma abordagem de enfermagem holística baseada na Teoria Geral dos Sistemas. Para o paciente oncológico, enfatiza a avaliação e abordagem de aspectos físicos e psicossociais que afetam sua saúde. Com foco na prevenção, promoção e reabilitação do sistema, busca reduzir estressores e manter o equilíbrio. A perspectiva sistêmica facilita a coleta de dados e ações adequadas. **Considerações finais e implicações para a prática:** O cuidado de enfermagem oncológico considera o impacto da doença e do tratamento não apenas no paciente individualmente, mas também na família, comunidade e sociedade, demonstrando uma visão sistêmica e holística na abordagem do cuidado.

Palavras-chave: Cuidados de Enfermagem; Enfermagem; Enfermagem Holística; Oncologia; Teoria de Enfermagem.

RESUMEN

Objetivo: Reflexionar sobre la Teoría de Sistemas de Betty Neuman en la atención holística de enfermería a pacientes con cáncer. **Método:** Este es un estudio reflexivo basado en el paradigma del Pensamiento Sistémico y la Teoría General de Sistemas de Ludwig von Bertalanffy, desarrollado a partir de discusiones en una asignatura de posgrado en enfermería, utilizando como referencia la Teoría de Sistemas de Betty Neuman. **Resultados:** El Modelo de Sistemas de Betty Neuman propone un enfoque holístico de enfermería fundamentado en la Teoría General de Sistemas. Para los pacientes con cáncer, destaca la evaluación y abordaje de los aspectos físicos y psicossociales que afectan su salud. Al centrarse en la prevención, promoción y rehabilitación del sistema, busca reducir los factores estresantes y mantener el equilibrio. La perspectiva sistémica facilita la recopilación de datos y la implementación de acciones adecuadas. **Consideraciones finales e implicaciones para la práctica:** Los cuidados de enfermería oncológica consideran el impacto de la enfermedad y el tratamiento no solo en el paciente individual, sino también en su familia, comunidad y sociedad, demostrando una visión sistémica y holística en el abordaje del cuidado.

Palabras clave: Atención de Enfermería; Enfermería Holística; Enfermería; Oncología Médica; Teoría de Enfermería.

INTRODUCTION

The World Health Organization (WHO)¹ defines cancer as a set of over one hundred diseases affecting any human tissue, known for a rapid and disordered growth of abnormal cells that tend to invade neighboring tissues and organs. Their causes are multifactorial and mostly related to genetic changes and behavioral and environmental factors.²

In several countries, cancer ranks first or second among the causes of death. The increase in its incidence and cancer-related mortality is the result of demographic and epidemiological changes occurring globally. Population aging, as well as behavioral and environmental transformations, such as social structure change impacting mobility, leisure activities, diet, and exposure to pollutants, are factors that contribute to cancer increase and the often-fatal consequences of this disease.³

The WHO predicts that by 2030 there will be more than 27 million new cases of cancer and approximately 17 million cancer-related deaths worldwide. In Brazil, cancer ranks as the second most frequent cause of death and has become a serious challenge for public health in this country.⁴

Furthermore, providing care to individuals undergoing cancer treatment can be a complex, long, and challenging process, as it involves multiple steps, unfamiliar specialized terminology and debilitating side effects.⁵ Therefore, it is essential to emphasize the relevance of care and a holistic approach towards individuals in the context of health and illness.

Thus, there is a need for professionals, especially nurses, who are qualified to assist patients supported by technical and scientific knowledge and who understand the particularities of cancer patient care, including empathy, attention, responsibility, and emotional support as part of their care.⁵

These considerations support the idea that nurses should be the professionals in charge of implementing strategies aimed at dignity, comfort, quality of life, and relief from suffering, in addition to the biopsychosocial and spiritual aspects, being sufficiently trained to provide humanized care that meets the specific needs of oncology patients. This implies respecting their individuality and promotes a comprehensive approach encompassing timely prevention, early detection, diagnosis, treatment, and palliative care.^{6,7}

Many cancer patients' needs can be met at no cost with just attention and dialogue. However, within nursing care, it is understood that nurses' functions are usually focused on treating the disease and not caring for people, which hinders safe and quality care by these professionals. In this context, the main challenge to nursing is to provide humanized care centered on attention, dialogue, and connection to cancer patients, based on a scientifically appropriate method.⁸

Among the theoretical foundations that guide this approach there are two significant references: Betty Neuman's Systems Theory and Systems Thinking, in the field of Nursing, and Ludwig von Bertalanffy's General Systems Theory. These theories and their underlying philosophy emphasize the relevance of establishing

a framework to support holistic nursing practice, considering clients as a whole and their interaction with the environment.

Thus, this study is justified by the urgency of providing further foundations to cancer nursing care with concepts and theoretical principles that qualify nurses for humanized, holistic, quality care centered on the specificities of cancer patients.

Also, there is a lack of scientific literature on Betty Neuman's Theory in cancer nursing care, which is shown by the results of a study on the state of the art in the Virtual Health Library (VHL) database, in which no studies related to this theory and the topic under discussion were found. Furthermore, there is a need to reflect on the theoretical and conceptual framework of the model, allowing us to improve nursing views with an emphasis on holism and the well-being of cancer patients.

This study aims thus to reflect on Betty Neuman's Systems Theory in holistic nursing care for cancer patients.

METHOD

This work is a theoretical and analytical essay with a logical and reflexive approach, in which argumentation and personal interpretation are emphasized as means of exposition, to answer the following question: "How can the application of Betty Neuman's Systems Theory contribute to a holistic approach to nursing care for cancer patients?"

This study was developed from March to July 2023 during a course named Philosophical and Theoretical Bases of Nursing in Health Care, taught in a Nursing postgraduate program at a public university.

This reflection was based on a narrative literature review in July 2023 which included searching for books, articles, and documents on this topic to discuss it from a theoretical/contextual point of view.

The Portuguese terms *oncologia* (oncology), *cuidados de enfermagem* (nursing care), *saúde integral* (integral health), *enfermagem* (nursing) and *teorias de enfermagem* (nursing theories) were searched for in the VHL. No specific inclusion or exclusion criteria were established for the bibliographic material, and the theoretical references were identified by the authors themselves, considering the topic was approached with no temporal restrictions.

To structure the theoretical framework and a for a thematic and conceptual deepening, we carried out a study of the paradigm of Systems Thinking/General Systems Theory by Ludwig von Bertalanffy, in addition to a reading of the book *The Neuman systems model* and the selected scientific articles that would enable drawing connections between the framework and cancer nursing care.

To structure result analysis, reflective points from the material were annotated, enabling an overview of this study's results.

RESULTS AND DISCUSSION

The Betty Neuman Systems Model is an open, dynamic energy system encompassing clients, groups, communities, or

social issues. This model is based, among other sources, on the General Systems Theory, developed by Ludwig von Bertalanffy in Biology; such a model is related to Gestalt and stress. Furthermore, Betty Neuman's Systems Model follows a holistic philosophical perspective and aims to promote well-being. The concepts of this model can be applied in an interdisciplinary, multidisciplinary, or transdisciplinary manner, covering different cultures.

Neuman's theory takes a systems approach focusing on human needs for protection and stress relief. Neuman believed that the causes of stress can be identified and treated through nursing interventions. She emphasized the importance of dynamic balance in human beings, which nurses can achieve by identifying problems, establishing shared goals, and using the concept of prevention as intervention.^{9,10}

Neuman incorporated systemic thinking into his nursing theory, allowing the perception of the connection among different aspects of the system, such as the influence of the environment on the individual's health and the relationship between health and emotional and social well-being. The systemic approach is applied to evaluate the patient, analyze the important variables that interfere with their balance, and determine the nursing interventions necessary to keep them balanced.

This theory is based on a multidimensional view of human beings, their families, groups, and communities, which are constantly interacting with environmental stressors. Neuman's model essentially emphasizes individual response to stress and adaptive factors. Thus, the theory is based on an open systems model, which includes stressors, reaction to stressors, and individuals' interaction with the environment. This is a constant interaction between the environment of individuals, families, and communities and the external and internal forces of their environment, which can modify the existing balance.^{9,10}

Therefore, Neuman's Systems Model encompasses two elements: stress and the reaction to stress. This model analyzes factors such as time and occurrences, present and past conditions of the individual, nature and intensity of the stressor, in addition to the amount of energy needed for the organism to adapt to situations.^{9,10}

By establishing a continuous connection among patients, their environment, general health, and nursing practice, nurses contribute to comprehensive care throughout the cancer patient's health-disease process. Theory-based use of tools, such as the Nursing Process, makes it possible to organize and systematize this type of care, with an emphasis on holism and interaction between the healthcare team, patient and family.

In this permanent context of interaction among its theoretical elements, stressors are problems that generate tension in the individual's system, impacting the individuals' interaction with their surroundings. Neuman classifies stressors, according to their nature, into three types: intrapersonal (within the limits of the system, as an autoimmune response), interpersonal (outside the limits of the system, as role expectation), and extrapersonal (outside the system, at a greater distance, as social policy).⁹

Extrapersonal stressors, which are external influences on the patient's system, can be understood as factors that trigger stress and anxiety related to the cancer patient's social environment.

Cancer diagnoses are known to adversely impact the patient's social context, considering that the financial burden associated to cancer treatment, such as the costs of medications and diagnostic tests, can be a significant source of stress for cancer patients.

Overall, morbidity is an influential factor in the context of cancer, especially during treatment, and becomes a hindrance for the patient to carry out their work activities. This triggers several challenges, such as unemployment and financial difficulties, generating even more stress within the patient's social context.

Family support, family and affective relationships, and interaction with the multidisciplinary team are noteworthy when it comes to interpersonal stressors. Families, especially the main caregivers of people undergoing cancer treatment, are considered essential support and the necessary link between patients, family members, and the healthcare team.¹¹

These caregivers have high stress levels, which might be due to the need to deal with external factors. In this case, these factors include depending on family members and care demands; there are also internal conditions related to anxiety, pessimism, and insecurity. The state of tension caused by stress can have physical and psychological consequences for caregivers, affecting their ability to understand the needs of the dependent person and provide appropriate responses. Such factors reduce the caregiver's knowledge about others and themselves, their courage to face adversity, and their ability to provide total care.

Family relations are fundamental in the life of cancer patients and conflicts, lack of understanding, or insufficient support represent interpersonal stressors. Likewise, affective relations, such as friendships and romantic relationships, can also generate strain in the interpersonal sphere and negatively impact the emotional and psychological health of individuals.

In this sense, nursing professionals, through coordination with members of the multidisciplinary team and levels of health care, can plan strategies to support caregivers, including health education and psychological support actions, with the aim of promoting adequate care and quality of life for cancer patient caregivers.¹¹

Intrapersonal stressors are related to individuals themselves and may be associated, for example, with anxiety and depression, their feelings regarding coping with the disease and fear of death. The experience of a cancer patient often includes an intense emotional battle, in which internal concerns, such as uncertainty about the future, the feeling of loss of control over one's life and the contemplation of existential questions can trigger intrapersonal stress.

Anxiety and depression are prevalent conditions in cancer patients. In this sense, assessment of anxiety and depression should always be considered, as these psychiatric disorders affect treatment adherence and quality of life and can influence the progression of cancer.¹²

It is then understood that, when providing holistic care to cancer patients, Neumann's theory emphasizes the need to evaluate and address the physical, psychosocial, and spiritual aspects that can affect patient health.

When providing care, nurses must consider the specific stressors associated with cancer diagnosis and treatment, as well as the patient's individual needs. Identifying the stress-triggering factors to which patients have been or are exposed and understanding how these factors affect not only individuals, but also their families, communities, and society are essential aspects to offer comprehensive and effective cancer care.¹³

Therefore, nurses must adopt a comprehensive approach, focused on promotion, prevention, and rehabilitation of the system, based on the concepts of primary, secondary, and tertiary prevention. The objective is to preserve a maximum level of well-being, in which nursing care aims to intervene in the event of imbalance, working in collaboration with the client to optimize their resources and thus allowing them to achieve system stability. Once this state is achieved, strategies are implemented to maintain homeostasis.⁹

Nursing plays a fundamental role in identifying and managing stressors in the cancer patient's family system. The approach begins with primary prevention, aiming to reduce the incidence of stressors that affect the system; at this stage, the aim is not only to avoid exposure to these stressors, but also to reduce their adverse reactions. If the stressor persists, attention is shifted to secondary prevention, focused on biopsychosocial stabilization, aiming to reduce symptoms, reduce the response to stressors, and strengthen the body's defenses.

Furthermore, tertiary prevention actions are implemented to mitigate the negative effects of stress on patient health, promoting their adaptation and well-being. It begins after completion of active treatment with a focus on interventions that promote readaptation, education to prevent recurrences, and maintenance of emotional stability and general well-being; to this end, we resort to conserving the patient's energy, as well as promoting their physical and mental capabilities, thus returning to the focus of primary prevention.¹⁰

The nursing team must assess not only their health, but also the environment and stressors, recognizing patients and their families as interdependent units. Based on Betty Neuman's theory, this approach seeks to promote balance and stability, considering physical, psychological, social and environmental aspects, and offering support to family relationships and overall quality of life.

This model allows for a comprehensive assessment of the patient, in which the parts or elements (variables) are organized into an interrelated system that is constantly interacting with the environment. These interactions can have positive or negative impacts on the patient's condition. When the system's needs are met, an ideal state of well-being is achieved, but when these needs are not met, the patient's well-being decreases.

That said, the nursing interventions for each nursing diagnosis aim at strengthening the body's defenses, minimize the impact of stressors, and promote the best possible state of well-being for cancer patients after recovery or reconstitution.

Within this theoretical framework, nursing plays a fundamental role in seeking to control the five fundamental variables (physiological, psychological, sociocultural, developmental, and spiritual) that are part of the basic structure of the patient's system, as well as the flexible and normal lines of defense and lines of resistance, seeking to promote the patient's homeostasis through the application of interventions at the primary, secondary, and tertiary levels. These lines of defense have a significant impact on patient care, whether for general system improvement, adaptation of behavior patterns, or improvement of skills in specific tasks.⁹

Thus, when planning nursing interventions, nursing professionals establish short- and long-term goals, along with strategies to maintain, preserve, and achieve the stability of the patient's system. During the evaluation, it is necessary to check whether the desired change has occurred or whether the strategies should be reformulated. The application of the nursing process according to Neuman's model enables evaluating not only the patient holistically, but also the relationship between the nursing professional and the patient, facilitating adequate data collection for future evaluations and planning.¹⁴

By applying systems thinking to her nursing theory, Betty Neuman recognizes the interconnection between the elements of the system and the mutual influence between the environment, health, and emotional and social well-being. This approach is used in assessing the patient, identifying the essential variables that affect the balance of the system, and determining the appropriate nursing interventions to restore or maintain this balance. This holistic perspective guides nursing practice, aiming to promote the health and well-being not only of individuals, but also of their social and family relationships.

To systematize model application, Neumann created a diagram that allows an expanded view of its concepts, covering the physiological, psychological, sociocultural, and developmental dimensions of the individual based on a holistic approach.¹⁵

Based on this diagram, the client can be described through a set of concentric circles, representing open systems that interact constantly and dynamically, both with each other and with other systems. From a systemic perspective, the client can refer to a person, a family, a group or a community, with the main elements of this model being stress and the response to stress. This system evolves in response to the interventions and the nurse is responsible for helping to restore the system's balance.¹⁵

The external, more solid, circle is known as the "normal line of defense" and represents the typical state of well-being or the state of adaptation over time. The dashed line extending beyond the normal line of defense is called the "flexible line of defense". Ideally, it aims to prevent stressors from penetrating the client's system by blocking or neutralizing these stressors before they can reach the normal line of defense.⁹

The model includes a series of concentric layers known as "resistance lines". These layers play the role of protecting the fundamental structure located at the core of the system and come into action when the conventional line of defense is impacted by stressors. Each line of resistance has internal and

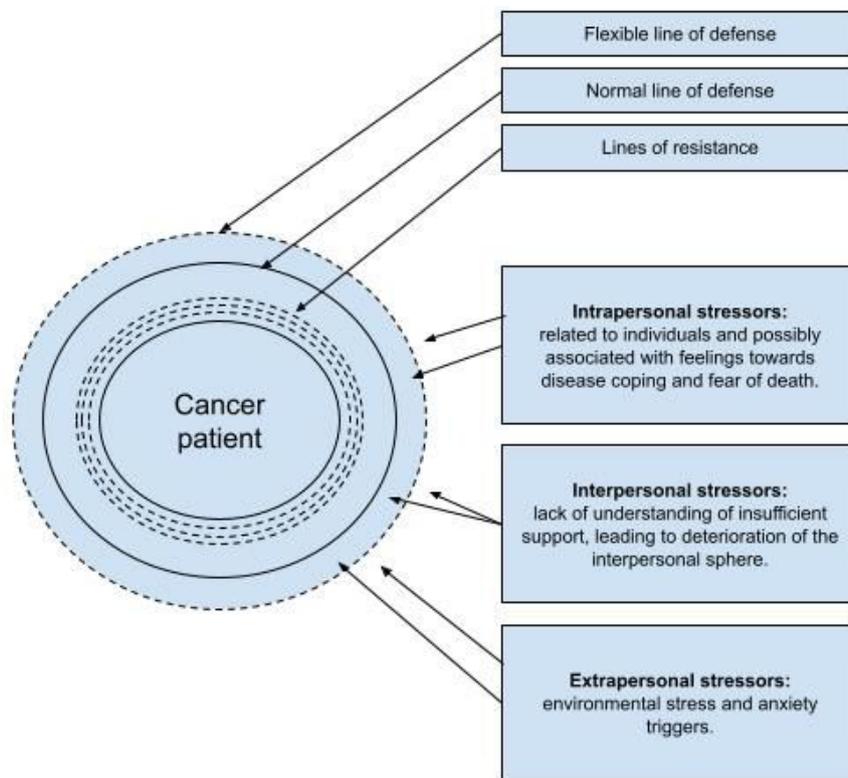


Figure 1. Diagram of Neuman's Systems Theory from the perspective of cancer patients.

Source: Adapted from McEwen¹⁰

external resources that provide support for both the patient's basic structure and the normal line of defense, thereby ensuring system protection.⁹

In Figure 1 we represent the Betty Neuman Theory Diagram to address the compression of systems in cancer patients.

The theory offers a solid foundation for comprehensive and holistic nursing care of cancer patients, allowing nurses to intervene not only on disease-related issues, but also on the patient's psychosocial needs. By considering the patient as part of a larger system, nursing professionals can identify and address stressors that affect the patient's homeostasis, including fear, anxiety, and family concerns.

This approach allows nurses to formulate nursing diagnoses and prescriptions aimed at providing emotional and practical support not only to patients, but also family members and caregivers. Treatment and the provision of support resources are added to educational activities about patient condition, as well as effective communication between the healthcare team and the family, as essential components of this comprehensive care.

FINAL CONSIDERATIONS AND IMPLICATIONS FOR PRACTICE

Betty Neuman's theory conceives nursing as a unique profession, which is dedicated to all the variables capable of

influencing an individual's responses to stressors, emphasizing the importance of nursing professionals in providing holistic care and seeking to maintain, recover, or achieve client system stability. This theory emphasizes the need to identify stressors through the interaction between nurses and clients and provides support for the formulation of coping strategies and relevant levels of prevention.

Cancer nursing care, in its systemic approach, involves identifying the stressors that affect patients and their families, considering intrapersonal, interpersonal, and extrapersonal aspects. This understanding allows the nurse to analyze the system as a whole and determine the level of intervention necessary to promote the patient's health and recovery. Through emotional support strategies, teaching coping skills, and guidance on resources, nursing plays an essential role in maintaining and rebuilding the stability of the individual's system and structure, establishing a permanent connection between the patient, the environment, health, and nursing itself.

Furthermore, cancer nursing care considers the impact of the disease and treatment not only on patients themselves, but also on their family, community, and society, demonstrating a systemic and holistic view in the approach to care.

As limitations of this reflection, there is a lack of studies, particularly recent ones, addressing Betty Neuman's Theory in the

care of cancer patients and that, to carry out this reflection, a narrative review was used, not a systematic review. Furthermore, another relevant limitation is the fact that only the Virtual Health Library was searched, which may have restricted access to a wider range of studies available in other international and specialized databases.

AUTHOR'S CONTRIBUTIONS

Reflection design. Tarcísio Tércio das Neves Júnior. Rejane Maria Paiva de Menezes.

Theoretical framework. Tarcísio Tércio das Neves Júnior. Rejane Maria Paiva de Menezes.

Theoretical framework analysis and interpretation. Tarcísio Tércio das Neves Júnior. Rafaella Guilherme Gonçalves. Maria Carolina Dantas Campelo Neves. Jonas Sâmí Albuquerque de Oliveira. Rhayssa de Oliveira e Araújo. Rejane Maria Paiva de Menezes.

Writing and critical review. Tarcísio Tércio das Neves Júnior. Rafaella Guilherme Gonçalves. Maria Carolina Dantas Campelo Neves. Jonas Sâmí Albuquerque de Oliveira. Rhayssa de Oliveira e Araújo. Rejane Maria Paiva de Menezes.

Approval of the final version. Tarcísio Tércio das Neves Júnior. Rafaella Guilherme Gonçalves. Maria Carolina Dantas Campelo Neves. Jonas Sâmí Albuquerque de Oliveira. Rhayssa de Oliveira e Araújo. Rejane Maria Paiva de Menezes.

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ASSOCIATED EDITOR

Marta Sauthier 

SCIENTIFIC EDITOR

Marcelle Miranda da Silva 

REFERENCES

1. World Health Organization – WHO. Cancer [Internet]. Geneva: WHO; 2023 [citado 2023 jul 10]. Disponível em: <https://www.who.int/news-room/fact-sheets/detail/cancer>
2. Alves MLDB, Marcolina V, Pissaia IF, Hauagge MS, Dal'Bosco A. Tratamento cirúrgico de carcinomas cutâneos: perfil epidemiológico dos pacientes em um centro de referência no sudoeste do Paraná. *RSD*. 2023;12(2):e16312240049. <http://doi.org/10.33448/rsd-v12i2.40049>.
3. Bonfim LN. Câncer de pele: medidas preventivas e perfil epidemiológico na região Nordeste do Brasil. *Revi Ibero-Am Hum Cienc Educ*. 2023;9(1):467-81. <http://doi.org/10.51891/rease.v9i1.8233>.
4. Souza NR, Bushatsky M, Figueiredo G, Melo JTS, Freire DA, Santos ICR. Emergência oncológica: atuação dos enfermeiros no extravasamento de drogas quimioterápicas antineoplásicas. *Esc Anna Nery*. 2017;21(1):e20170009. .
5. Cogo SB, Reisdorfer AP, Beck JL, Gomes TF, Ilha AG, Leon PB et al. Percepção de enfermeiros e médicos sobre a assistência aos pacientes da oncologia no pronto socorro. *Rev Bras Enferm*. 2020;73(Suppl 6):e20190677. <http://doi.org/10.1590/0034-7167-2019-0677>. PMID:33338137.
6. Rodrigues DMV, Abrahão AL, Lima FLT. Do começo ao fim, caminhos que seguiu: interações no cuidado paliativo oncológico. *Saúde Debate*. 2020;44(125):349-61. <http://doi.org/10.1590/0103-1104202012505>.
7. Machado A, Assis MP, Vinhatti F, Padilha JC. Assistência de enfermagem integral ao paciente oncológico em tratamento: revisão de literatura. *Ver Saúde Fac Dom Alberto [Internet]*. 2023 [citado 2023 jul 10];10(1):69-89. Disponível em: <https://revista.domalberto.edu.br/revistadesaudeomalberto/article/view/812/734>
8. Lateef A, Mhlongo E. A literature review on people-centered care and nursing practice in primary health care setting. *Glob J Health Sci*. 2020;12(2):23. <http://doi.org/10.5539/gjhs.v12n2p23>.
9. Neuman B, Fawcett J. *The Neuman systems model*. 5th ed. Upper Saddle, NJ: Pearson; 2011.
10. McEwen M. *Bases teóricas de enfermagem*. 4ª ed. Porto Alegre: Artmed; 2016. 590 p.
11. Serçekuş P. Becoming a family caregiver of a patient living with cancer. *Int J Palliat Nurs*. 2020;26(5):206-12. <http://doi.org/10.12968/ijpn.2020.26.5.206>. PMID:32584696.
12. Wondie Y, Mehnert A, Hinz A. The Hospital Anxiety and Depression Scale (HADS) applied to Ethiopian cancer patients. *PLoS One*. 2020;15(12):e0243357. <http://doi.org/10.1371/journal.pone.0243357>. PMID:33270779.
13. Souza DG, Brandão VP, Martins MN, Morais JAV, Jesus NO, organizadores. *Teorias de enfermagem: relevância para a prática profissional na atualidade*. Campo Grande: Inovar; 2021. 56 p. <http://doi.org/10.36926/editorainovar-978-65-80476-74-9>.
14. Lima FDM. Teoria de Betty Neuman no cuidado à pessoa idosa vítima de violência. *Rev Baiana Enferm [Internet]*. 2014 [citado 2023 jul 10];28(3):219-24. Disponível em: <https://periodicos.ufba.br/index.php/enfermagem/article/view/11989/9235>
15. Barbosa JF, Vasconcelos EMR. Análise crítica do diagrama proposto pelo Modelo dos Sistemas de Betty Neuman. *Revista Enfermagem Atual in Derme*. 2023;97(4):e023184. <http://doi.org/10.31011/read-2023-v.97-n.4-art.2014>.

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