

# Prevention of Complications in Cancer Patients: A Systematic Review

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**Abstract:-**The oncologic patient faces a series of doubts and uncertainties characterized by the fear of the side effects that these procedures bring with them, being prevention one of the most effective strategies to be able to cope with this scenario, with direct repercussion in their emotional/psychological state. The main objective was to determine the measures to prevent complications in oncologic patients. A systemic literature review was carried out, using the following databases: PubMed, Scielo, Redalyc, Scopus, Springer y Science direct. Using the following keywords: "oncologic", "prevention" "complications". The results of the systematic review have made it evident that the management of prevention of complications is a fundamental component of the treatment of the cancer patient and should be based primarily on prevention rather than treatment. Effective prevention management in oncology patients allows for a better quality of life for the patient, avoids potentially serious complications and facilitates adherence to chemotherapy treatment. The probability of presenting complications depends primarily on the chemotherapy plan, and therefore the precise determination of the same is fundamental for the individual management of each patient. Most of these complications can be prevented since they develop due to errors in the education of oncology patients.

**Keywords:-** Complications, Cancer, Prevention.

## I. INTRODUCTION

Cancer is one of the main public health problems, which in the last decade has increased notably within the framework of chronic degenerative diseases, affecting men and women without exception (1).

This disease is characterized by the uncontrolled proliferation of cells, it begins with the transformation of a single cell, which can have its origin in external agents and in inherited genetic factors, one of the treatments of choice for this disease is chemotherapy/radiotherapy depending on the cases and the stage, nursing care in this treatment should include the prevention of complications that occur in the

long term, as part of the most important activities because it allows the patient to actively participate in their care (2).

In many cases of oncologic patients who receive a surgical treatment, temporary or permanent, they do not cease to be a problem for the patients if they do not have knowledge of prevention in order to lead a more pleasant life and thus avoid complications that aggravate their current situation (3).

Therefore, the nurse who works in the area of oncology patient care should carry out an educational program aimed at informing, resolving doubts and questions of the patient and family members about prevention before, during and after the treatment received, in order to reduce and prevent in some cases the risk of complications derived from the treatment and possible hospital readmissions, as well as to improve their quality of life (4).

The present study seeks to determine the effectiveness of prevention of complications in oncology patients, about the treatment, side effects that may occur, special care and how this treatment can modify their lives (5). This in order to have evidence for health professionals to implement and/or improve educational programs based on the knowledge needs of each patient and his family about these aspects, not only inside the hospital but also outside it (6).

Continuous follow-up of patients should also be established, where a team of health professionals treat the person holistically, teach them how to take care of themselves, how to manage their symptoms, also take care of their mental health, and above all provide the emotional support that is so necessary in these cases; this would reduce the negative impact on the life of each person, minimize the possibility of mistakes by the patient related to the management of their disease and help to reduce undesirable situations or complications that hinder the outcome of the treatment established (7).

The reason for this research is due to the fact that oncology patients currently face a series of doubts and uncertainties characterized by the fear of the side effects that

these procedures bring with them, a situation that directly affects their recovery and quality of life (8). In view of this reality, prevention is one of the most effective strategies to cope with this scenario, which implies that the person knows or is aware of the different preventive actions or precautions to consider in order to achieve a satisfactory state of health (9).

The prevention of complications in an oncological patient is an aspect that has a direct impact on his physical, mental and emotional health, since the person takes the corresponding measures to take care of himself, ceasing to feel "useless", adapting certain behaviors to the reality of his treatment, with self-esteem, confidence and hope that everything will go well, actions that although they may not seem of great importance, for specialists such as Júlia Schneider, are related to his quality of life and emotional well-being (10).

Considering all the above, the present scientific article of bibliographic review arises with the purpose of determining the effectiveness in the prevention of complications in oncological patients, we will proceed to duly substantiate the subject addressed by means of a theoretical support duly referred, which will then be contrasted with the data obtained, being able then to corroborate or refute the hypotheses that are part of the study (11).

The following research questions have been posed: What are the types of nursing interventions aimed at teaching for the prevention of complications in oncologic patients? and What effects does the application of nursing interventions aimed at teaching produce in the prevention of complications in oncologic patients?

## II. METHODOLOGY

### Type of research

A systematic review of the literature was carried out. The recommendations of the PRISMA statement were used to carry out this process. The document was written through the analysis and synthesis of relevant scientific information on prevention of complications in oncologic patients.

### Search strategies

The following databases were reviewed: PubMed, Scielo, Redalyc, Scopus, Springer and Science direct. The following terms and keywords were used: "prevention", "complications", "oncology" (in Spanish) and "prevention", "complications", "oncology" (in English). The intersection between these descriptors, using Boolean AND and OR connections. We also reviewed cross-sectional, retrospective and prospective studies.

**Table 1: Detailed search strategies.**

Database	Records obtained	Date of search
PubMed	15	12/12/2020
Scielo	50	16/12/2020
Redalyc	10	05/01/2021
Scopus	8	08/01/2021
Springer	6	30/12/2020
Science direct	5	22/12/2020

### Inclusion criteria

The selection of articles was made as follows:

- Languages: Spanish and English.
- Year of publication: from 2010 to 2020.
- Original research article.
- Quantitative or mixed studies.
- Quality of the articles.

### Exclusion criteria

We excluded from the study articles that are not from the year of publication sought, thesis type studies (undergraduate, graduate and doctoral), monographs and argumentative essays, the impossibility of retrieving the full text of the article and articles repeated from a previous search.

### Procedure

In the first stage, the topic and formulation of the research question in the acronym format PICO (Population, Intervention, Control and Outcome) were identified: "What are the types of nursing interventions aimed at teaching for the prevention of complications in oncology patients?" and "What effects does the application of nursing interventions aimed at teaching produce in the prevention of complications in oncology patients?"

In the second stage, original articles related to the prevention of complications in oncology patients, published in Portuguese, English and Spanish, with full text and online, were established as inclusion criteria, and thesis-type studies (undergraduate, graduate and doctoral), monographs and argumentative essays were established as exclusion criteria. Then, in the third stage, the primary selection of publications was made by reading the title and abstract.

In the fourth and fifth stages, the studies were evaluated with more criteria (according to the objectives set), and the results obtained were interpreted, which led to the sixth stage where the formation of the discussion and synthesis of knowledge was established. A systematic review was carried out with rigorous and exhaustive scientific information with studies with more and better pertinent information, without introducing information or publication bias, in such a way as to contribute to the scientific community.

**Table 2. Summary of article selection process.**

No. of records obtained in each database (200 items)	Phase 1: Screening according to article title and abstract (62 articles)	Phase 2: Screening according to full text and article quality (13 articles)
PubMed: 3 Scielo: 5 Redalyc: 2 Scopus: 1 Springer: 0 Science direct: 1	PubMed:3 Scielo: 5 Redalyc: 2 Scopus: 1 Springer: 0 Science direct: 1	PubMed: 3 Scielo: 5 Redalyc: 2 Scopus: 1 Springer: 0 Science direct: 1

### III. RESULTS

Cancer is a serious disease, but when optimal care is provided, it can be reversed. In this sense, the quality of life of people with cancer includes multiple dimensions: physical, social, psychological and spiritual, which the nursing professional will take into account in his care plan; the measures of well-being will be functional activities of pain management, fatigue, tiredness, sleep, nausea, vomiting and other symptoms as individual responses of the patient. Self-care and complication prevention skills are moderately related to quality of life in adult cancer patients. Therefore, considering self-care and quality of life as fundamental pieces for the prevention and recovery of the health of individuals, it points to the importance of a work aimed at an integral health care with an expanded look at the psychosocial aspects of health. Some of the findings were that people who improved their capacity for self-care perceive their quality of life better, effectively reducing later complications.

**Table 2.** Articles selected for review with their main results.

<i>Authors/citation/ Year/ Country/ Database/Number</i>	<i>Participants</i>	<i>Interventions</i>	<i>Results</i>	<i>Tipo de estudio</i>
Vázquez Llanos, Díaz Campos and Pérez Rondón (23) 2019/Cuba Scopus/1	18 cases diagnosed with cancer, with the addition of their family members, and 27 families designated by the Basic Health Team as families at risk.	23 surveys applied in two workshops carried out in the chair for the elderly belonging to the San Juan de Dios Popular Council, which dealt with the prevention of chronic non-communicable diseases and aging. Information collection instruments were applied to a total of 162 people.	Deficiencies were shown in the prevention actions carried out in the community and in the comprehensive care of oncology patients and their families, from a psychosocial approach.	Quantitative-qualitative cross-sectional descriptive study.
Veinramuthu San kar Parthasarathy Rama Jerrin Mathew (24) (2020) India Scielo/2	A study was conducted in a multispecialty hospital over an 8-month period among 100 hospitalized cancer patients in the oncology department.	Drug-drug interactions were analyzed using the Medscape drug interaction checker.	Sixty-five interactions were identified out of 100 patients. Of all drug-drug interactions, 33.85% were major, 60% were moderate and 6.15% were minor interactions. Clinically significant interactions were reported (55.38%) and 69.44% of them were accepted and modified accordingly. In addition, we observed 50.77% of interactions between coadministered drugs. Older people (48%) have more comorbidity, such as diabetes (30%) and hypertension (17.81%).	Prospective - observational study.
Cintia Capucho Rodríguez Caroline Guilherme Moacyr Lobo da Costa Júnior Emilia Campos de Carvalho (25) (2012)	It was performed with 30 women with breast cancer.	It was performed during a session of antineoplastic chemotherapy for the treatment of breast cancer, in an oncology outpatient clinic of a university hospital in the interior of the state of São Paulo, Brazil. Data were	The type of catheter material presented an association suggesting risk (RR = 2.76; CI = 1.199, 6.369); the infusion rate factor was RR = 2.22; whereas, CI = 0.7672, 6.436; The trajectory factors, number of punctures and vein movement present RR.	Quantitative observational study.

Brasil. Scielo/3		observed throughout the procedure, identifying whether the result occurred or not.		
Luiza Zanette Reolon Lilian Rigo Ferdinando de conto Larissa Cunha (26) (2017) Brasil. Scielo/4	18 cancer patients in hospital care who developed oral mucositis.	A sociodemographic questionnaire and the Quality-of-Life questionnaire (UW-QOL) were applied before the low power laser sessions and after lesion regression. The statistical tests used were Student's t-test and Chi-square test, assuming $p < 0.05$ to be significant.	The most prevalent age group was 65 to 74 years old, white, male, married, primary schooled, SUS users and residents of different cities. The most frequent cancer diagnosis was acute leukemia, with chemotherapy being the treatment in 100% of cases and radiotherapy in 50%. The mean quality of life score of the patients was 456.2 before the start of laser treatment and 678.3 after the intervention.	This is a quasi-experimental trial.
Frank Daniel Martos-Benítez Anarelys Gutiérrez-Noyola Adisbel Echevarría-Vítores (27) Cuba. Scielo/5	179 consecutive patients who underwent thoracic or digestive tract surgery for cancer and were admitted to an oncologic intensive care unit.	The incidence of postoperative complications was evaluated using the Postoperative Morbidity Survey and its influence on mortality and hospital stay.	Postoperative complications occurred in 54 subjects (30.2%); the most frequent were pulmonary (14.5%), pain (12.9%), cardiovascular (11.7%), infectious (11.2%) and surgical wound (10.1%). In the multivariate logistic regression analysis, pulmonary (OR 18.68, 95%CI 5.59 - 62.39, $p < 0.0001$ ), cardiovascular (OR 5.06, 95%CI 1.49 - 17.13, $p = 0.009$ ), gastrointestinal (OR 26.09, 95%CI 6.80 - 100, $p = 0.009$ ), and gastrointestinal (OR 26.09, 95%CI 6.80 - 100, $p = 0.002$ ) complications were associated with the most common complications; CI95% 6.80 - 100.16; $p < 0.0001$ ), infectious (OR 20.55; CI95% 5.99 - 70.56; $p < 0.0001$ ) and renal (OR 18.27; CI95% 3.88 - 83.35; $p < 0.0001$ ) complications were independently related to hospital morbidity. The occurrence of at least one complication increased the probability of remaining hospitalized (Log Rank test; $p = 0.002$ ).	Prospective cohort study
García Almeida, Lupiáñez Pérez, Mercedes Blanco Naveira, Ruiz Nava, Medina, Cornejo Pareja, Gómez Pérez, et al. (28) España. Redalyc/6	30 patients with malnutrition or at risk of malnutrition. Supplementation lasted six days. Compliance (containers used), acceptability (Madrid scale), anthropometric variables and gastrointestinal adverse events (AEs) were evaluated.	Supplementation lasted six days. Compliance (packaging used), acceptability (Madrid scale), anthropometric variables and gastrointestinal adverse events (AEs) were evaluated.	Seventy percent were men, with a mean age of 60 years (range: 32 to 79) and with neoplasms of the lung (43.3%), ENT (26.7%) and breast (13.3%), stage III-IV (56.7%), treated with radiotherapy (93.3%), chemotherapy (60%) and surgery (16.7%). The product was accepted by all patients. Compliance was 100%. Gastrointestinal AEs (grade II) related to the supplement were observed in two patients (6.7%); both subjects had previous gastrointestinal pathologies. Median weight, body mass index (BMI) and protein intake increased during supplementation (0.2	Single-center, observational, prospective study.

	evaluated.		kg, 0.1 kg/m <sup>2</sup> and 6.2 g). No differences were observed with respect to calorie, lipid and carbohydrate intake.	
Araujo et al. (29) (2015) Colombia. Redalyc/7	Probabilistic sample of 163 patients under outpatient follow-up.	Fatigue was assessed using the Piper fatigue scale.	Clinically relevant fatigue (score $\geq 4$ ) was present in 31.9% of the sample and the mean intensity was 6 (SD = 1.3). Pain and depression were factors independently associated with fatigue	Cross-sectional study
Marques da Silva et al. (30) (2017) Brazil Pubmed/8	Conducted with 144 patients (72 men and 72 women) under chemotherapy treatment in a hospital in southeastern Brazil.	Data were collected from a sociodemographic and clinical questionnaire and the European Organization for Research and Treatment of Cancer's Health-Related Quality of Life instrument.	Cognitive function leads to lower overall quality of life, with greater impact on men compared to women. Body image (p=0.023), abdominal pain (p=0.020) and dry mouth (p=0.001) represent lower quality of life in women, while in men are the symptoms: fecal incontinence (p<0.001), sexual impotence (p=0.027) and sexual interest (p<0.001).	Cross-sectional study.
Pachón Ibáñez et al. (31) (2018) Pubmed/9	We compared 131 patients who received glutamine orally at a dose of 10 g / 8 hours with 131 patients who did not.	To know the incidence of odynophagia, treatment interruptions and analgesia and nasogastric tube requirements.	Patients not taking glutamine had a 1.78-fold increased risk ratio for mucositis (95% CI [1.01-3.16], p = 0.047). For odynophagia, patients not taking glutamine had a 2.87-fold increased hazard ratio (95% CI [1.62-5.18], p = 0.0003). 19.8% of patients who did not take glutamine discontinued treatment versus 6.9% of patients who did (p = 0.002). Regarding support requirements, 87.8% of patients without glutamine required analgesia versus 77.9% of patients with glutamine (p = 0.03) and nasogastric tube was indicated in 9.9% and 3.1% respectively (p = 0.02).	Prospective cohort study.
Soolmaz Moosavi et al. (32) (2020) Brazil. Pudmeb/10	It was carried out with 21 participants, who were selected by purposive sampling.	Semi-structured interviews were used to collect data. The data were analyzed using the conventional content analysis method.	Two themes of "systematic mindfulness" and "mindfulness with paradoxical outcomes" were extracted from our participants' experiences of spiritual mindfulness.	Descriptive qualitative study.
Veintramuthu Sankar et al. (33) (2019) India. Scielo/11	In a multispecialty hospital. For a period of 8 months among 100 oncology patients hospitalized in the oncology department.	This study concluded that DDIs are very common in cancer patients, particularly in people with more comorbidities and using multiple medications. The clinical pharmacist and physicians should work together to extend the practice of DDI prevention in the management of individual patients to improve their quality of life.	In this study, 65 IDD were identified out of 100 patients. Of all DDIs, 33.85% were major, 60% were moderate and 6.15% were minor DDIs. Clinically significant DDIs were reported (55.38%) and 69.44% of them were accepted and modified accordingly. In addition, we observed 50.77% of DDIs among coadministered medications. Older people (48%) had more comorbidity such as diabetes (30%) and hypertension (17.81%).	Prospective-observational study

Ruiz-Moria et al. (34) Perú. (2018) Science Direct/12	Patients seen during 2017 in a Cardiology Service due to post-chemotherapy bradycardia.	The DDIs were analyzed using Medscape drug-drug interaction checker.	Fifty-nine patients were evaluated, 31 males (52.5%) and 28 females (47.5%), with a median age of 42 years. The median heart rate was 46 beats per minute. Bradycardia was more frequent in acute myelocytic leukemia (25.42%), followed by acute lymphoblastic leukemia (20.34%). It was asymptomatic in 88.13% of cases. The chemotherapy drugs associated with bradycardia in acute myelocytic leukemia were cytarabine in combination with daunorubicin, while in acute lymphoblastic leukemia they were vincristine in combination with daunorubicin. Long QTc interval was present in 12 cases (20.34%). The time between chemotherapy and onset of bradycardia was 24 to 48 hours in 35.6% and heart rate recovery was between 24 to 48 hours in 61.02%.	Non-experimental, descriptive, retrospective study.
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#### IV. DISCUSSION

Due to the natural history of the disease, cancer patients present extreme physical instability. Starting from this situation of instability, they will have multiple complications throughout the evolution of their disease. The aim of this article was to determine the measures to prevent complications in oncologic patients. A multidisciplinary management with a holistic vision of the patient is important in order to detect and treat as early as possible the physical problems that the patient will encounter during the course of his disease.

##### ➤ *Epistemological evolution of nursing care*

Given the importance of the contribution of the discipline of nursing to the care of the oncological patient, it is necessary to start from a review for this, an analysis is made in which the dimension of a conscious formation of a philosophy in nurses is highlighted, as well as its relationship with the development of science and its link with this discipline, taking into account that it is precisely philosophy, a fundamental element in the integral formation that society currently demands (12).

The need to begin to interpret and search for unifying meanings in clinical practice is becoming more evident every day. To act sensibly and with professional judgment, a strong conceptual reasoning is required, to work on the epistemic object of nursing and to deepen the identity of being, knowing and doing of the professional discipline (13). We proceed to conceptualize everything that care implies in order to strengthen in a better way the scientific support, we take the characteristics that correspond to Dorothea Orem's model, which is based on the vital self-care in oncological patients (14). Nursing theories and models are not really new, they have transcended since Dorothea Orem proposed her ideas about nursing as a profession and not only as a charitable action towards the human being as it was seen at that time, since then nursing practices and

interventions have been adapted to the requirements of each care center (15).

The theories and models become nowadays the basis of patient care, they allow organizing nursing interventions that sustain the discipline as a working method since nurses learn to think critically and to strengthen their actions in scientific evidence (16). Critical thinking has been incorporated at present as a new academic field in nursing, which is almost nonexistent in clinical practice in our country. Moreover, the models constitute a guideline for professional practice, since they provide a common language that channels the work in a single front of action (17). The models of care in general are the basis from which all the processes of patient care emerge. They provide a focus and organization that are based on the concepts proposed by the conceptual model and the nursing work method or nursing care process (18).

##### ➤ *Strategies in the prevention of complications in oncology patients.*

Oncological diseases have increased in recent decades, constituting one of the health problems worldwide, within the chronic regenerative diseases affecting both men and women, increasing the mortality rate, among these we have oncological diseases that require alternative treatment, with the aim of recovering the patient's state of health, reducing mortality and the risk of complications (19).

Thus, the person who undergoes this treatment frequently experiences unpleasant situations due to physiological, dietary, hygienic, esthetic, psychological, social and economic changes in his bio-psychological homeostasis (20). It is evident that the oncologic patient considers his disease as a great limiting burden in different aspects of life and that he has to learn to carry it as a normality being the prevention for health an initial part in the rehabilitation of the oncologic patient and that the nursing staff knows the basic principles of the teaching-

learning process, has competences to communicate with the patient, has the opportunity to provide education to the patient, requiring prior identification of individual educational needs as well as skills, limitations and willingness to learn everything that is provided on the care for their new condition of life, favoring a decrease in the frequency of hospitalizations for complications and thus a significant decrease in morbidity and mortality of the oncology patient (21).

The prevention practices of oncology patients reveal the importance of the educational role of the nursing professional and through the educational activities carried out after identifying the patient's needs as well as the limitations and willingness to learn, it makes it possible to create the necessary conditions for a permanent education that responds to the patient's needs, favoring their active participation in their health care through horizontal communication, a good interaction between the nursing staff, patient, family to strengthen knowledge and practices on nutritional needs, and needs of love, belonging and self-esteem, favoring their independence and social reintegration, making them co-participants in the same, reducing complications and costs in health care, contributing to the improvement of their quality of life (22).

## V. CONCLUSIONS

The results of the systematic review have made it clear that the management of the prevention of complications is a fundamental component of the treatment of cancer patients and should be based fundamentally on prevention rather than treatment. Effective prevention management in oncology patients allows for a better quality of life for the patient, avoids potentially serious complications and facilitates adherence to chemotherapy treatment.

The probability of presenting complications depends primarily on the chemotherapy plan, and therefore the precise determination of the same is fundamental for the individual management of each patient. Most of these complications can be prevented since they develop due to errors in the education received by oncology patients.

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