



**THE NURSING TEAM IN THE HANDLING AND DISPOSAL OF
CHEMOTHERAPY: INTEGRATIVE REVIEW**
**A EQUIPE DE ENFERMAGEM NO MANUSEIO E DESCARTE DA
QUIMIOTERAPIA: REVISÃO INTEGRATIVA**
**EL EQUIPO DE ENFERMERÍA EN EL MANEJO Y ELIMINACIÓN DE LA
QUIMIOTERAPIA: UNA REVISIÓN INTEGRADORA**

Maria Vitoria dos Santos da Conceição¹, Joyce Barros dos Santos², Larissa Caina Barbosa de Azarias³, Mylena Bomfim de Albuquerque⁴, Vitória Rejane de Lira Ferreira⁵, Keila Cristina Pereira do Nascimento Oliveira⁶.

RESUMO

Objetivo: identificar as estratégias recomendadas na literatura direcionadas à equipe de Enfermagem sobre o descarte e manuseio das excretas de pacientes em tratamento quimioterápico antineoplásico. **Método:** estudo tipo revisão integrativa com a definição da pergunta norteadora seguida da definição dos descritores utilizados. Após essas duas etapas, foram aplicados os critérios de inclusão e exclusão. **Resultados:** os estudos selecionados na amostra final, totalizando oito artigos, revelam que a grande maioria dos profissionais tem conhecimento da importância do uso contínuo dos EPIs, mas que, ainda assim, necessitam de educação permanente para se fazer uso deles. **Conclusão:** os resultados dos estudos pesquisados foram coerentes com o que se esperava e indicaram que a educação é crucial para aumentar a prática real em trabalhos.

Palavras-chave: Antineoplásico. Eliminação de Excretas. Equipe de Enfermagem.

ABSTRACT

Objective: identify the recommended strategies in the literature directed to the Nursing team on the disposal and handling of excreta from patients undergoing antineoplastic chemotherapy treatment. **Method:** integrative review-type study with the definition of the guiding question followed by the definition of the descriptors used. After these two steps, the inclusion and exclusion criteria were applied. **Results:** the studies selected in the final sample, totaling eight articles, reveal that the vast majority of professionals are aware of the importance of the continuous use of PPE, but still need permanent education to make use of them. **Conclusion:** the results of the studies researched were consistent with what was expected and indicated that education is crucial to increase actual practice in work.

Keywords: Antineoplastic. Disposal of Excreta. Nursing Team.

Objetivo: identificar las estrategias recomendadas en la literatura dirigida al equipo de Enfermería sobre la eliminación y manejo de las excretas de pacientes sometidos a quimioterapia antineoplásica. **Método:** estudio de revisión integradora con la definición de la pregunta orientadora seguida de la definición de los descriptores utilizados. Luego de estos dos pasos, se aplicaron los criterios de inclusión y exclusión. **Resultados:** los estudios seleccionados en la muestra final, que suman ocho artículos, revelan que la gran mayoría de los profesionales son conscientes de la importancia del uso continuo de EPI, pero que, aun así, necesitan una educación permanente para su uso. **Conclusión:** los resultados de los estudios investigados fueron consistentes con lo esperado e indicaron que la educación es crucial para incrementar la práctica laboral real.

Palabras-clave: Antineoplásico. Eliminación de excretas. Equipo de enfermería.

^{1,2,3,4,5,6} State University of Health Sciences of Alagoas. Maceió (AL), Brazil.

INTRODUCTION

Cancer is a nomination for a group of more than 100 pathologies, having a similarity in its characteristics, such as uncontrolled proliferation of cells, which can invade all types of tissues and be able to reach and spread through several organs.¹ For the most effective treatment, early detection is necessary, but even so, the bearer of the disease sometimes needs to go through invasive and debilitating procedures, such as surgery, hormone therapy, radiotherapy and chemotherapy - the most applied therapy today.¹ Antineoplastic chemotherapy acts within the cell, hindering growth and cell division, with the aim of healing. In the assistance to the patient using this type of medication, it is mandatory to train the nursing team in the pharmacology of antineoplastic chemotherapy, their adverse reactions and the manipulation of these drugs.² Chemotherapy is produced with chemicals in order to eliminate the malignant tumor and restore the patient's health. Some authors mention, as main side effects of chemotherapy, myelodpression, nausea and vomiting, alopecia, renal toxicity, cardiotoxicity, pulmonary toxicity, cancer, sterility, among other adverse effects.^{1,3}

Risks from handling chemotherapeutic agents include direct contact with the skin, mucous membrane and ingestion of food with residues of the same. The risk may come from the excreta of patients in antineoplastic chemotherapy treatments, since part of these substances remain unchanged or in the form of inactive metabolites, found in the feces, urine and vomit of patients, acting as a factor for the spread of chemical agents, which are harmful to the health of workers, relatives and patients.³

Due to the toxicity of chemotherapy, the professionals, during the handling and disposal, must obligatorily use Personal Protective Equipment (PPE), being some of them gloves, long sleeve apron, glasses, cap, mask and others. They should also obtain initial and continuous training, ensuring the training of the workers involved.⁴ Professionals who handle chemotherapy on a daily basis, during the preparation, administration and disposal of medication or perforation, are subject to direct exposure to active chemical agents. In addition to the professionals who indirectly expose themselves to contamination in workplaces, accidents with medication. The Nursing team is worthy of attention for the daily contact to the occupational exposure.³

In view of the above, interest was aroused in the elaboration of the work based on the guiding question: "What is the scientific evidence about the care of the Nursing team during the handling and disposal of antineoplastic

chemotherapy?" Thus, considering the importance of the subject, this study aimed to characterize the studies that discuss the performance of Nursing in the disposal and handling of excreta from patients in antineoplastic chemotherapy treatment, identifying the strategies and recommended behaviors.

METHOD

The Integrative Review (IR) is a form of research that has as its data source the available literature on some topic. This is because this form of research provides evidence linked to some type of specific intervention strategy in order to search, contemplate, criticize and synthesize the information. Thus, six stages of IR will be used for this study: choice of the guiding question; search in the literature; data collection; evaluation of the studies included in the review; interpretation of the results and synthesis of the knowledge.⁵

Thus, from the first stage of RI, the guiding question defined was: "What is the scientific evidence about the care of the nursing team during the handling and disposal of antineoplastic chemotherapy?" Then, the search strategy was established through the analysis of scientific papers accessed in the PubMed and VHL databases, according to the descriptors (DeCS/MESH) defined for this study. The descriptors used in Portuguese were: "*Enfermagem Oncológica*"; "*saúde do trabalhador*"; "*exposição ocupacional*", with its corresponding translation in English ("oncology nursing", "occupational health", "occupational exposure").

A estratégia de busca utilizada foi através dos descritores em inglês associados ao operador booleano "and", com cruzamento usado para relacionar os termos "oncology nursing" e "occupational health" e "occupational exposure". For data collection, the instrument used was taken from the master's thesis entitled "Prevention of skin lesions in the perioperative period: an integrative literature review", having as author Elizabeth Silva Ursi. All the instruments were filled in according to the selected articles, categorizing them in terms of type of publication, objective, interventions carried out, results.

The inclusion and exclusion criteria were then applied for the selection of articles. The inclusion criteria for the articles initially defined were: articles published in Portuguese and English, for the period 2013-2018. The following were excluded from the editorial selection and case reports that did not refer to the disposal and handling of excreta from patients undergoing antineoplastic chemotherapy treatment and repeated articles.

In the interpretation of the results, the proposals recommended by the articles regarding nursing care during the handling and disposal of antineoplastic

chemotherapy were evaluated, comparing the opinions of the authors with other studies. In view of the studies for the conclusion of the articles, a synthesis of the acquired knowledge and suggestions for effective nursing care in the management of cytotoxic drugs from chemotherapy were created.

RESULTS

In a first database search, a total of 69 articles were obtained using the descriptors. After the initial reading of the abstracts, 14 articles were selected that were related to the objective of this study. From this selection, the complete reading of the articles and the filling out of the data collection instrument were started. Through an analysis of the articles found and evaluated according to the objective of the study, eight articles were selected as a final sample.

Figure 1. General characteristics of the final sample of articles selected by this search.

The studies that make up the sample of this research present their original versions in English, in international journals and over a period of five years, being one article in 2013, two researches in 2015, three articles in 2016 and one study in 2017 and 2018, according to table 1.

In table 2, all the objectives and methodologies of the final sample of this study are verified. Among the eight articles, two are identified in qualitative methodology and six in quantitative methodology. Regarding the objectives, it is possible to identify the authors' concern for risk exposure in the handling of antineoplastics and disposal of excreta, as well as strategies to minimize risks and accidents at work and, finally, in article three, the use or not of PPE is evaluated.

Study objective
Identify all potential risks and accidental events that could lead to an accident related to the management of excreta and implement a global policy of risk reduction and quality improvement.
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Exploring the nurses' concerns about the decision to use or not to use PPE in the cultural context of Taiwan
Present the scheme and describe the main features of the "Joint Guidelines for Safe Handling of Cancer Chemotherapy Drugs" (from now on, "Guideline"), which were published in July 2015.

Num	Authors	Article Title	Journal title	Year
1	Leduc-Souville, Bertrand, Schlatter,	<i>Risk management of excreta in a cancer unit</i>	<i>Clinical Journal of Oncology Nursing</i>	2013
2	Zhang, Zheng, Lv, An, Zhang, Wei, et al.	<i>Evaluation of adverse health risks associated with antineoplastic drug exposure in nurses at two chinese hospitals: the effects of implementing a pharmacy intravenous admixture service</i>	<i>American Journal of Industrial Medicine</i>	2016
3	Chen, Lu, Lee.	<i>Nurses' experiences in safe handling of chemotherapeutic agents: the taiwan case</i>	<i>Cancer Nursing</i>	2015
4	Kanda, Hirai, Iino , Nomura, Yasui, Kano , et al.	<i>Salient features and outline of the joint japanese guidelines for safe handling of cancer chemotherapy drugs</i>	<i>Asia Pacific Journal of Oncology Nursing</i>	2018
5	Callahan, Ames, Manning, Touchton-Leonard, Yang, Wallen.	<i>Factors influencing nurses' use of hazardous drug safe-handling precautions</i>	<i>Oncology Nursing Forum</i>	2016
6	Jeong, Lee, Kwon, Jang.	<i>Safety management status among nurses handling anticancer drugs: nurse awareness and performance following safety regulations</i>	<i>Asian Pacific Journal of Cancer Prevention</i>	2015
7	Poupeau, Tanguay, Plante, Gagne, Caron, Bussieres	<i>Pilot study of biological monitoring of four antineoplastic drugs among Canadian healthcare workers</i>	<i>Journal of Oncology Pharmacy Practice</i>	2016
8	Topçu, Beşer	<i>Oncology nurses' perspectives on safe handling precautions: a qualitative study</i>	<i>Contemporary Nurse</i>	2017

Identify factors associated with the use of dangerous substances by cancer nurses and safe medication handling (HD) precautions in inpatient clinical research units.

Identify the management characteristics and the relationship between such variables in terms of recognition and performance.

Present the results of a pilot project on the biological monitoring study of four antineoplastic drugs.

Describe attitudes, opinions and experiences of nurses on the administration of antineoplastic drugs with respect to safe handling precautions.

Figure 2. Distribution according to article listing, study objective and methodology.

DISCUSSION

The risk of deleterious effects from exposure to cytotoxic properties of antineoplastic agents is not restricted to patients only, and family members and

especially health care professionals may also present cellular alterations. There are several clinical manifestations related to occupational exposure with these substances. Despite the knowledge about the risks of poor handling of anti-cancer drugs, this issue does not receive the necessary attention, neither from the professionals directly involved, such as nurses, pharmacists and doctors, nor from managers, and what can be observed is that, in the 21st century, there are still cases of contamination by anti-cancer agents due to the incorrect handling of these drugs.⁶

In a study with cancer nurses,⁷ it was observed that there was a significant relationship between the workload of nurses and exposure to chemotherapy, which points to a real problem faced by these professionals, who see themselves with many patients for the number of people on the team and, to try to expedite, end up leaving aside the safe way of handling those drugs. Another problem detected in this study is the paradigm that exists in some nursing professionals, who believe that the quantity of PPEs, whose use is necessary for the manipulation of chemotherapy, bothers the patients, an idea that ends up bringing a negative view to the use of this equipment in the Nursing team itself.⁸⁻⁹

In view of the experiences mentioned above and which have provided the basis for this study, it can be easily observed that continuing education is something essential to avoid contamination with anti-cancer drugs.⁹

According to the National Health Surveillance Agency (Anvisa),⁴ in Resolution RDC 220/200⁴, it is necessary to train the professionals involved, directly or indirectly, with the application of the procedure, through permanent education programs properly registered. Managers in the oncology sectors should encourage the use of all personal protective equipment to be constant and incisive. In addition to effective continuing education, it is the responsibility of managers to provide all equipment necessary for this handling to occur in the safest possible way, such as an exclusive room for the preparation of drugs for antineoplastic therapy and PPEs such as latex gloves (surgical type), long cuff, talc-free and sterile, long apron, masks and glasses.^{4,9}

Occupational exposure is underestimated by Nursing workers and hospital managers, and there are no enforcement measures on the use of PPE and on the signs and symptoms of illnesses arising from contact with chemotherapy.^{3,10} The use of PPE is mandatory through the preparation of the drug and the handling of

contaminated biological materials of patients undergoing chemotherapy treatment.^{4,11}

Even with imminent risks in the handling of antineoplastic chemotherapy, there is a lack of health education and few strategies for reducing contact with active metabolites, and the Nursing Team is highly likely to have long-term adverse effects. Continuing education provides professionals with theoretical and practical updating, qualifying them. Thus, they are guided in the correct handling from the preparation to the disposal of excreta.¹²⁻¹³

The results of the research studies congruent with the results of this study indicate that education is crucial to increase actual practice in works. In addition, with the control of anti-cancer drugs, the appropriate method to administer the drug should be included in the educational content. There should be periodic education to update knowledge.¹²

This study addresses knowledge deficits, which are critically important for the promotion of safe practices among cancer nurses, combining continuing education and feedback from the Nursing team, which are also important. All potential exposure routes, including dermal PPE removal exposure, should be included in training and curriculum. Education and training should address knowledge deficits as well as correct behaviors that can put nurses at risk of exposure. Although this study reports only a positive level of 5-FU chemotherapeutic drug, it demonstrates the difficulty of maintaining a contamination-free environment, despite several safety measures. During the preparation of drugs, direct contact with the substances occurs and, as a preventive measure, there are the engineering controls used in pharmacy: drug transfer system in closed system for the preparation of chemotherapy Nursing; drug transfer device in closed system for administration; biological safety booth or intravenous administration service in pharmacy (PIVAS),¹⁰ in order to gradually reduce occupational exposure.⁴

Despite engineering controls, administrative policies and high adherence to appropriate PPE, a positive finding indicated the potential for occupational exposure. Unfortunately, 5-FU and other chemotherapeutic drugs are highly stable and may persist over time. In addition, surface clean-up tests represent only a single point in time; it is not indicative of the potential for repeated exposure through some contact with a work surface.¹³

In some studies, participants demonstrated great knowledge about exposure, self-efficacy, risk perception, interpersonal influences and safety climate in the

workplace. The average total use of precautions proved to be the highest during administration of these drugs and the lowest for handling excreta at 48 hours. The nurses exhibited more precautions with the drugs when fewer patients were assigned. However, despite the knowledge of high exposure, barriers to PPE, use and conflict of interest can contribute to reducing the adoption of practical protection measures among oncologic nurses.¹⁴

According to the survey conducted in Japan, there was dispersion in the environment during the preparation of the drug, contamination of needles used during the preparation, contamination of the surroundings by dangerous drugs and leakage. It was also seen that the frequency of genetic damage was significantly higher in the exposure group and the frequency of primary DNA was significantly lower in subjects who used PPE. Control measures have increased rapidly in Japan, once the guidelines are published, however, there are differences in the level of understanding and adoption of control measures between different occupations within an organization.¹⁵ Investment in periodic safety education for new nurses and nursing technicians who deal directly with these drugs is of fundamental necessity, since these professionals must be educated on the subject, since nurses who work in oncology must be true educators, making, by example, their main instrument of education and propagation of the same and carrying out casters of professionals in order to avoid health consequences, especially for pregnant employees. And, with the last proposal, the preparation of the antineoplastic drug should be carried out in the pharmacy of each hospital.¹⁶⁻¹⁷

CONCLUSION

The proper disposal of excreta from patients who use chemotherapy, both for the health care team and family members, is still a matter to be increasingly worked on and discussed within the institutions providing services in the field of oncology, since the vast majority of professionals and agents responsible do not do so properly, exposing themselves to risks.

From this point of view, emphasis is placed on the search and propagation of new research on the subject in order to propose or even elaborate self-explanatory protocols or manuals so that, in this way, the disposal is carried out in a correct manner, seeking to analyze and correlate the occupational risks and the general risks that people who handle this waste suffer, thus incorporating a new practice in the assistance to these patients in a safe manner. In this sense, the study presents a significant contribution to the literature of this content, pointing out that the problem presented needs further discussion to be solved, having as a

basic principle of solution, the education of all those involved in this process.

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