Occupational risk of nurses exposed to care with chemotherapeutics: context analysis

Risco ocupacional de enfermeiros expostos à assistência com quimioterápicos: análise de contexto

Riesgo laboral de enfermeros expuestos al cuidado con quimioterapéuticos: análisis de contexto

Maria Luíza de Araújo Guedes[1], Andressa Rallia Aquino Soares[1], Dayara Ainne de Sousa Araújo[1], Mariana Larissa Oliveira dos Santos Silva[2], Maysa Mayran Chaves Moreira[1], Natasha Ribas de Figueiredo Ortiz Abreu[1], Kessya Dantas Diniz[1], Quenia Camille Soares Martins[1]

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1. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0002-0273-1304

2. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0002-5675-8721

3. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0002-0593-2443

4. Faculty of Health Sciences of Trairi. Federal University of Rio Grande do Norte. Santa Cruz, Rio Grande do Norte, Brazil.
https://orcid.org/0009-0005-1652-9720

5. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0002-9576-9036

6. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0002-2110-8921

7. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0001-6784-3166

8. Federal University of Rio Grande do Norte, Department of Nursing. Natal, Rio Grande do Norte, Brazil.
https://orcid.org/0000-0002-4036-2423

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RESUMO

Objetivo: analisar o contexto do risco ocupacional da enfermagem na assistência com quimioterápicos. **Método:** Trata-se de uma revisão de escopo, realizada de setembro a novembro de 2023, para análise de contexto segundo Hinds et al. Buscou-se por estudos indexados nas bases de dados SCOPUS, PUBMED, Web of Science, Cochrane, LILACS, ScienceDirect, Embase, Google Acadêmico®, Academic Archive Online, Europe E-theses Portal, PsychINFO, The National Library of Australia's Trobe, Repositório Científico de Acesso Aberto de Portugal, Educational Resources Information Center, Portal de teses e dissertações da Capes, e por lista paralela de referências. Buscou-se responder a seguinte questão de pesquisa: "quais os contextos que a assistência de enfermagem com quimioterápicos traz risco ocupacional?". A amostra foi composta de 35 estudos, possibilitando a análise dos contextos imediato, específico, geral e metacontexto, conforme o método. **Resultados:** O risco existente para a enfermagem representa um contexto imediato, influenciado pela não adesão aos EPI e desconhecimento acerca desses riscos, sendo estas formas de prevenir ou minimizar os riscos. **Conclusão:** A existência de legislação e norma demonstra a preocupação governamental, mas o desconhecimento dos profissionais impacta negativamente.

Descritores: Enfermagem Oncológica; Riscos Ocupacionais; Saúde Ocupacional; Exposição Ocupacional; Antineoplásicos.

ABSTRACT

Objective: to analyze the context of occupational risk in nursing when providing chemotherapy. **Method:** This is a scoping review, carried out from September to November 2023, for context analysis according to Hinds et al. We searched for studies indexed in the databases SCOPUS, PUBMED, Web of Science, Cochrane, LILACS, ScienceDirect, Embase, Google Scholar®, Academic Archive Online, Europe E-theses Portal, PsychINFO, The National Library of Australia's Trobe, Repository Portuguese Open Access Scientific, Educational Resources Information Center, Capes theses and dissertations portal, and a parallel list of references. We sought to answer the following research question: "in what contexts does nursing care with chemotherapy drugs pose occupational risks?". The sample was composed of 35 studies, enabling the analysis of the immediate, specific, general and metacontext contexts, according to the method. **Results:** The existing risk for nursing represents an immediate context, influenced by non-adherence to PPE and lack of knowledge about these risks, these being ways of preventing or minimizing risks. **Conclusion:** The existence of legislation and standards demonstrates government concern, but professionals' lack of knowledge has a negative impact.

Descriptors: Elderly; Oncology Nursing; Occupational Risks; Occupational Health; Occupational Exposure; Antineoplastics

RESUMEN

Objetivo: Tiene como objetivo analizar el contexto de riesgo laboral en enfermería al momento de brindar quimioterapia. **Método:** Se trata de una revisión de alcance, realizada de septiembre a noviembre de 2023, para análisis de contexto según Hinds et al. Se buscaron estudios indexados en las bases de datos SCOPUS, PUBMED, Web of Science, Cochrane, LILACS, ScienceDirect, Embase, Google Scholar®, Academic Archive Online, Europe E-theses Portal, PsychINFO, The National Library of Australia's Trobe, Repository Portuguese Open. Acceda al Centro de Información de Recursos Científicos, Educativos, al portal de tesis y disertaciones de la Capes y a un listado paralelo de referencias. Se buscó responder a la siguiente pregunta de investigación: "¿en qué contextos los cuidados de enfermería con medicamentos quimioterapéuticos plantean riesgos laborales?". La muestra estuvo compuesta por 35 estudios, permitiendo el análisis de los contextos inmediato, específico, general y metacontextual, según el método. **Resultados:** El riesgo existente para la enfermería representa un contexto inmediato, influenciado por la no adherencia al uso de EPI y el desconocimiento sobre estos riesgos, siendo estas formas de prevenir o minimizar riesgos. **Conclusión:** La existencia de legislación y normas demuestra preocupación gubernamental, pero el desconocimiento de los profesionales tiene un impacto negativo.

Descriptores: Enfermería Oncológica; Riesgos Laborales; Salud Ocupacional; Exposición Ocupacional; Antineoplásicos.

SCOPING REVIEW

Introduction

Occupational health (WH) considers the various elements present in the work environment that can impact their physical and mental well-being. Occupational health (OS) emerges to understand the health-disease-work process with a focus on determinants, recognizing that working conditions, occupational risks (OHR) and labor relations directly influence the health of individuals.[1]

The institutionalization of WH in Brazil is intertwined with the course of collective health.[2] The Unified Health System (SUS) integrates WH as an important dimension of health care, articulated with other areas, such as health surveillance and primary care, seeking to promote preventive, care and rehabilitation actions. Thus, the structuring of WH in the SUS is supported by legislation and regulations that guarantee rights and protection to the OR.[3–5]

Despite this, work activities expose the individuals who perform them to different risks. Proper identification of ROs is essential to implement preventive and safety measures at work.[6] The OR refers to the possibility of exposure to conditions or agents in the work environment that can cause damage to TS. Professionals working in the oncology field are subject to exposures that require special precautions. Some of the major ROs in oncology include chemical exposure, ionizing radiation, biohazard, and psychosocial risk.[7]

Nursing plays a crucial role in the care of cancer patients, unfolding in several dimensions that directly impact quality of life and the treatment process.[8] This reality not only exposes them to various risk situations, but also highlights the importance of effective interventions for the safety of professionals. Developing prevention and protection strategies becomes a significant step towards the continuous improvement of professional practice.

The present study aims to analyze the context of nursing OR in chemotherapeutic care, proposing to answer the following research question: "what contexts does nursing care with chemotherapy bring?"

Method

This is a scoping review, conducted between September and November of 2023, for context analysis based on the theoretical model of Hinds et al.(9)

The theory raises four interactive contextual levels: immediate, specific, general, and metacontext. For the study, the immediate context refers to the pathways in which nurses are exposed to the RO of care with chemotherapy drugs; the specific context contemplates the aspects that influence the protection or enhancement of RO; the general context encompasses measures proposed or carried out, as well as the consequences for professionals who were exposed to RO from chemotherapy drugs; and the metacontext evaluates the progress of the MB of nurses exposed to chemotherapy care, in order to analyze elements associated with laws and regulations.

The guiding question used the PCC strategy (population, concept and context). The population was composed of nursing, the concept was OR and the context was care with chemotherapy, resulting in the following question: "what contexts does nursing care with chemotherapy bring?"

The recommendations of the JBI were followed, based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR); and a protocol containing: theme, objectives, research question, eligibility criteria, population, concept, context, identification of relevant studies by searching electronic databases, selection of studies, mapping, data extraction and presentation of results.[10-11]

The searches were carried out in three stages. The first stage used the Scopus (Elsevier) and PUBMED Central sources to search for the indexed descriptors (Medical Subject Headings - MeSH and in the Health Sciences Descriptors - DeCS), and keywords referring to the PCC strategy, namely: P (Nursing; Oncology nursing; Oncology Nursing; Nurse; Nurses; Nurse; Nurses), C (Occupational Risks; Occupational health; Occupational Health; Occupational Risks; Professional exposure; Occupational exposure; Professional exposure; Occupational exposure), C (Assistance with chemotherapy; Antineoplastic drugs; Antineoplastic Agents; Professional exposure; Occupational exposure; Antineoplastic medicine; Chemotherapy. The Boolean operators "AND" and "OR" were also used.

The second stage took place in the following databases: SCOPUS, PUBMED Central, Web of Science, Cochrane Library, LILACS - Latin American and Caribbean Literature in Health Sciences, ScienceDirect, Embase, Google Scholar®, Academic Archive Online (DIVA), Europe E-theses Portal (DART), PsychINFO, The National Library of Australia's Trobe (Trove), Open Access Scientific Repository of Portugal (RCAAP), Educational Resources Information Center (ERIC), and Capes Theses and Dissertations Portal. The third phase was carried out through a parallel list of references.

The inclusion criteria were: complete studies available in the databases that address nursing MB and that are available in full electronically. Exclusion criteria were abstracts, editorials, correspondence, expert opinion, and book chapters.

The screening was carried out by the dynamic reading of the titles and abstracts, followed by the complete reading. Duplicate studies were counted only once.

For data extraction, a protocol was developed with study information (title, indexed data source, authors, language, country, year of publication, methodology, and approach) and items related to context analysis (immediate, specific, general, and metacontext aspects).

Results

In the gray databases and literature, 26,111 articles were found, but 2 were not available electronically. After analysis of title and abstract, 26,076 were excluded because they did not meet the eligibility criteria, totaling 35 studies. Of these, after the complete reading, all were included in the sample.

With the parallel reading of the references, no studies were included. Figure 1 shows the selection flowchart for sample composition.

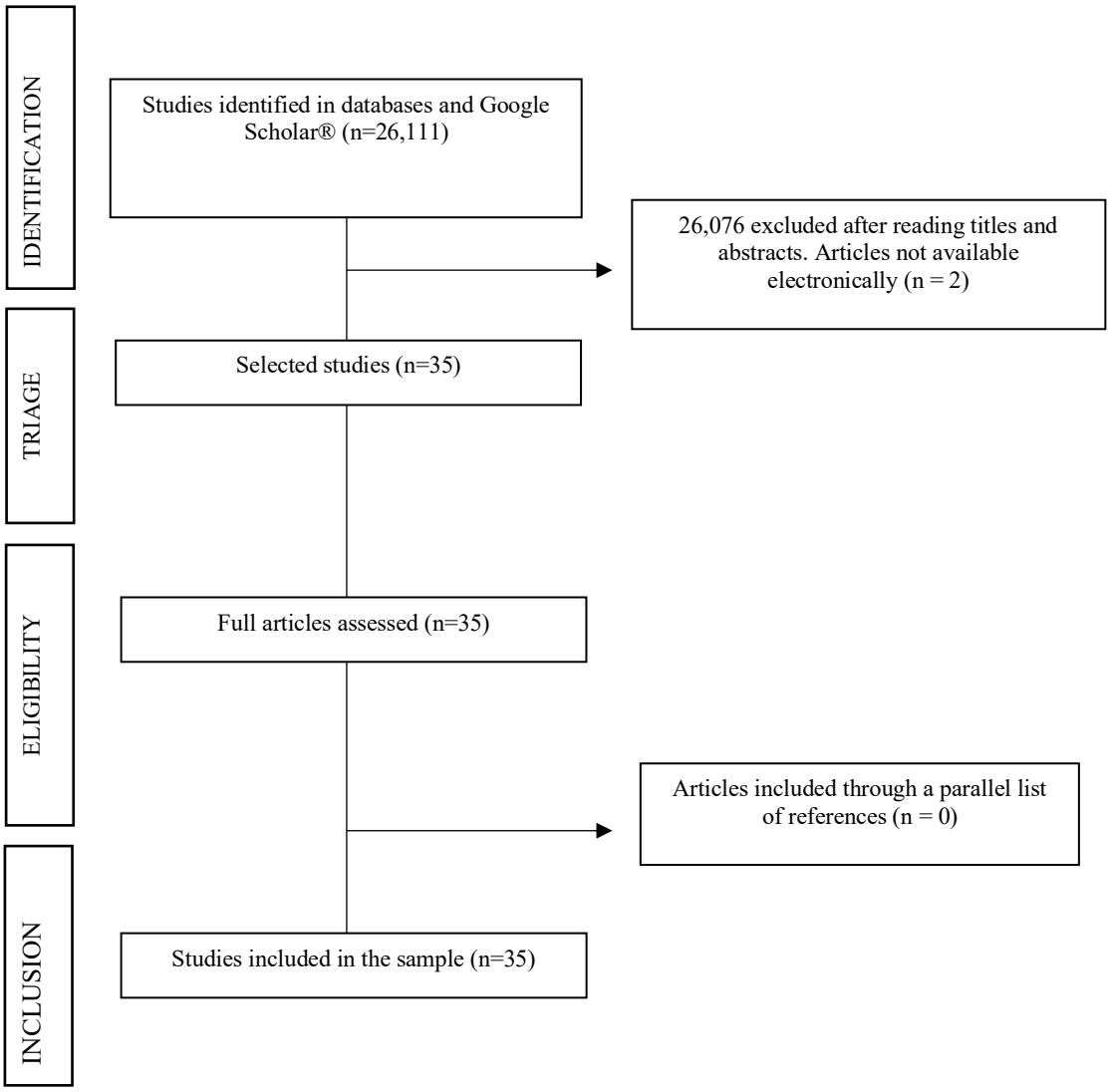

Figure 1 - Flow diagram of the selection process of the studies in the databases.

The sample had a predominance of publications from the last 5 years (n = 19), dating from 2019 to 2023. Regarding location, Brazil was the country with the highest number of studies (n=12), with the English language (n=22). For the method used, cross-sectional studies prevailed (n=10), followed by descriptive exploratory studies (n=8)

For the contextual levels, there were forms of contamination as an immediate context; factors that influence the understanding and use of individual protection measures in the specific context; risks or consequences of exposure to chemotherapy drugs as a general context; and in the metacontext, policies and regulations that protect professionals from exposure to occupational risks in the care of patients undergoing chemotherapy. These levels are described in Figure 2.

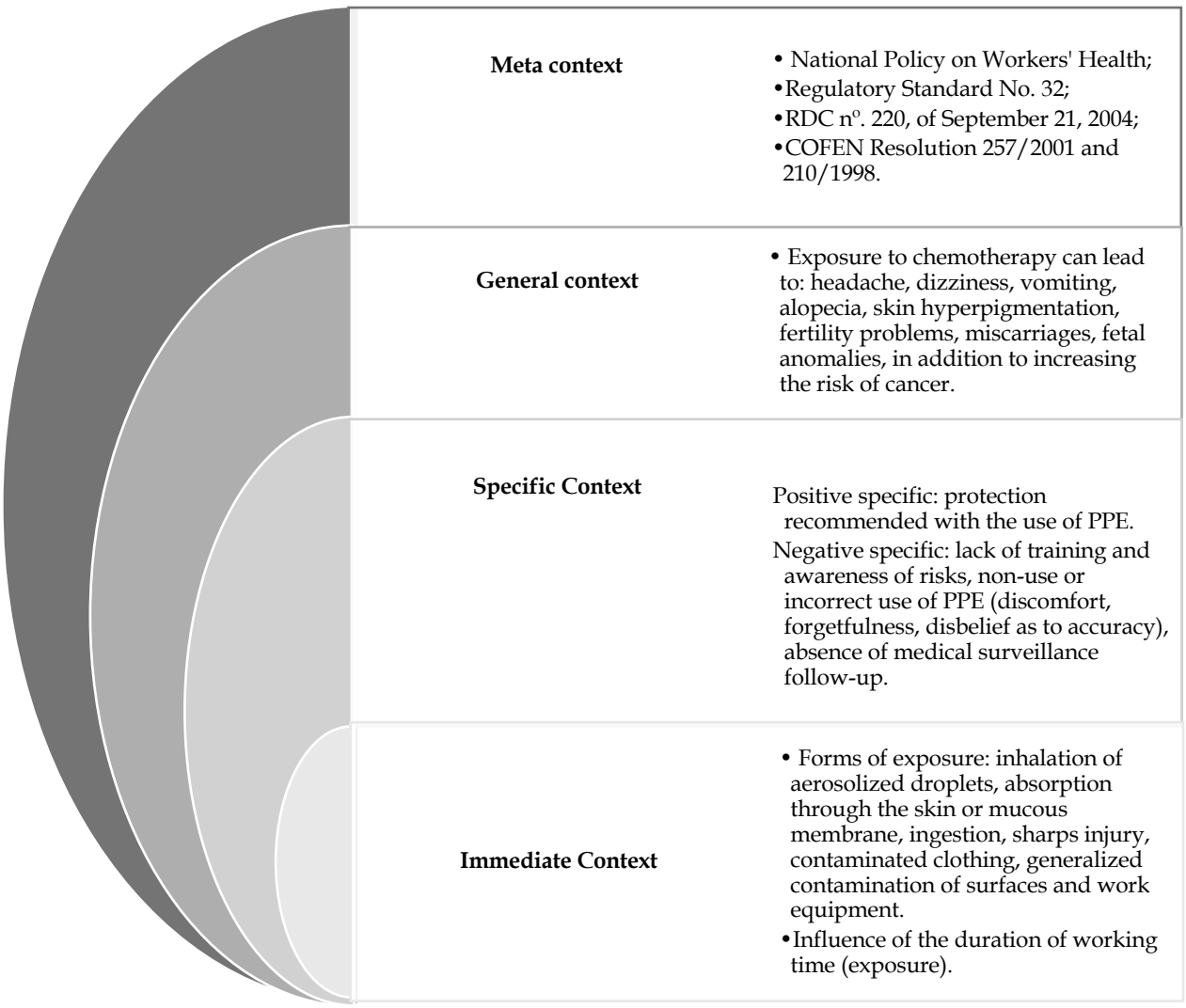

Figure 2 - Contextual levels of occupational risk of nursing exposed to chemotherapy care.

Discussion

Existing risks for nursing handling chemotherapy drugs, an immediate contexto

ROs are classified as physical, chemical, biological, ergonomic and accidental. Chemical risk consists of the probability of chemical agents causing harm to the worker who handles it. Occupational accidents related to antineoplastic chemotherapy drugs, according to NR 32, can be of the following types: environmental, when there is contamination of the environment, by spillage or solid or liquid aerodispersoids, enabling dermal absorption; and personal, when contamination occurs by direct contact or inhalation.[6] Contamination can also occur indirectly, through the handling of clothing contaminated by fluids (urine, feces, and vomit) of patients undergoing treatment with antineoplastic drugs.[12]

The risk to human health is given by the toxicity of the drug, sensitivity of the handler, exposure time, potency and the cumulative effect. There is no consensus in the literature on the mechanism of action of carcinogenic substances to define a safe level of exposure, recommending the shortest possible time.[6] The competent authorities recommend that the management of all antineoplastic drugs be considered as hazardous waste.[13-14]

The probability of contamination of nursing workers is enhanced by the low adherence to the use of PPE, the deficit in the knowledge of these professionals regarding the risks to which they are exposed, the exhausting workload, the low interprofessional relationship and the precarious work environment.[7] PPE is indicated for use in all stages of the management of antineoplastic drugs, including transport, preparation, administration, disposal and care of body fluids of patients using these agents, as a measure to mitigate the risk of exposure.

The absence of institutional protocols aimed at guiding the conduct of professionals regarding the handling of antineoplastic drugs and the conduct in case of accidents involving spills of these substances can also compromise the safety of these professionals.[15]

Prevention or minimization of RO for exposed professionals, a specific context

We observed that issues related to the exposure of professionals, even with a considerable improvement, still have negative repercussions on the health scenario. According to NR-32, different strategies are used, whether through training or qualification, as well as with the use of PPE.

In a study carried out with nurses in Korea who administer chemotherapy drugs, the use of PPE was well accepted. It is worth mentioning that this equipment is not only used for the administration of medications, but for any activities that present the risk of occupational exposure: contact with patients, through personal or bed clothes, secretions and waste from patients and situations with spillage of the substance on surfaces in the work environment.[16]

Among the PPE used during the handling of chemotherapy drugs are: disposable and waterproof long-sleeved apron with a tight cuff and closed at the front, length below the knee, face respiratory mask with filter or activated carbon, goggles with side protector, long-sleeved gloves and double plastic bag for collecting used clothes and garbage.[16] However, the issues presented, such as the lack of awareness about the health risks and the absence of training for the team, contribute to the feeling of discomfort and disbelief in the use of this equipment, increasing the risk of contamination of nurses and patients.

The situations are also directly related to the inexperience of the professionals, with a feeling of disqualification regarding biosafety in the oncology area. Studies indicate that, when starting their activities in the oncology sector of an institution, about 25% of the nurses received training with an average of fifteen days, however, another 22% did not receive any type of training or training.[16] Comprising NR 32, professionals must receive this training before the beginning of their activities, and on an ongoing basis.[17]

The training must inform whenever there is a change in the conditions of exposure to biological agents, in addition to content such as: main routes of occupational exposure; therapeutic and adverse effects of these drugs; the possible risk to health, in the long and short term; standardized standards and procedures related to the handling, preparation, transportation, administration, distribution and disposal of antineoplastic drugs; and the rules and procedures to be adopted in the event of accidents.[17]

Thus, it is essential to associate the use of PPE with continuing education for nurses, considering that both guarantee the effectiveness of care and the reduction of risks due to the occupational exposure of this public.

Consequences due to RO exposure to chemotherapy drugs: general contexto

Among the side effects of exposure to antineoplastic agents, reproductive effects are common: infertility, risk of fetal anomalies, premature births, or miscarriages. As adverse effects, the literature reports pregnancy outcome and genotoxic lymphocyte damage in nurses who administered antineoplastic drugs, indicating that 10% of them had spontaneous abortions.[6] Although frequent in studies, these data are old, and there are no current discussions about this occupational exposure.

Symptoms such as headache, dizziness, vomiting, alopecia and cutaneous hyperpigmentation represent the main side effects related to the exposure of nurses to antineoplastic drugs. Even with the validity of RDC No. 220/2004, studies justify that the presentation of these symptoms in the professional is associated with the preparation and/or administration without PPE, resulting in the absorption of the toxic substance.[18] In addition, the storage, preparation, administration, and disposal surfaces of these drugs are areas prone to waste accumulation. Floors, walls, equipment, packaging, syringes, medicine bottles, contact with clothing, body fluids, and patient disposals represent significant exposure.[19]

Exposure and absorption result in short- and long-term impacts. A study carried out with nurses concluded that the number of lymphocytes with DNA damage was considerable in professionals who did not use PPE or who did not use it correctly. Thus, length of service, practices, habits and environmental factors in oncology sectors are associated with genotoxicity.[19]

Metacontext: Brazilian legislation to ensure the safety of professionals

Protecting and minimizing damage to WH is the focus of several Brazilian legislations. The law of the professional practice of Nursing, exclusive to the nurse the administration of chemotherapy drugs, in addition to the supervision and guidance to the nursing team, requiring constant qualification and improvement.[20] It also points out criteria for protection against different types of risks existing in work activities.[21]

To clarify professional competencies, in 2018 the Federal Nursing Council (COFEN) approved resolution No. 569, bringing the Technical Regulation for the Performance of Nursing Professionals in Antineoplastic Chemotherapy.[22] In addition to regulating the attributions, the rules guarantee protection to professionals in contact with these substances, encouraging the adoption of safety measures in health establishments.[23]

In a general scenario, the most prominent legislation, and one of the first in the country to deal with the functioning of health services, the Resolution of the Collegiate Board (RDC) of the National Health Surveillance Agency (ANVISA) No. 220/2004 points out, among other requirements for the protection of workers, the use of PPE when exposed to chemical agents.[24] It also proposes guidelines, from storage to administration, for the safe management of chemotherapy drugs, and highlights the importance of training and professional updating programs.[12,15,25]

In 2005, the Ministry of Labor and Employment reinforced continued training in biosafety and the possible risks, including the chemical ones to which professionals are exposed.[17] It also established protective measures for the adoption of good safety practices in the workplace. NR 32 also recommended some specific conditions for the handling of chemotherapy drugs, preparation, administrative activities and storage.[6,17,21,23,25]

Articles point to the National Policy on Safety and Health at Work (PNSST), of 2011, prepared by the Ministries of Labor, Social Security and Health, which brought important aspects for the promotion of WH and the prevention of damage related to its activities, regardless of the sector.[15,26,27]

These and other legislations provide a normative framework for patient care activities in chemotherapy with the promotion and guarantee of safety and reduction of MB, addressing not only direct prevention measures, but also surveillance and monitoring of workers' health.[23] It is understood from the metacontext that there is an effort by the country's regulatory agencies to focus on WH, and that the lack of knowledge of it can make professionals more susceptible to OHR.

Conclusion

The study made it possible to integrate and analyze the context of occupational risk in nursing in the face of the manipulation of chemotherapy drugs, based on the existing literature. It is observed that there is government concern with occupational health in general, and with agencies in the area specifically with this scenario. However, this study highlighted the need for attention on the part of institutions regarding the exposure of workers to chemotherapy drugs, training and use of PPE by the professional team. It is also noted that there is precision of information to professionals regarding the risks to which they are exposed and rights legally ensured. In addition, more studies in the area are needed to support actions to prevent and minimize risks regarding this type of chemical exposure.

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Correspondent Author
Maria Luíza de Araújo Guedes.
Federal University of Rio Grande do Norte - Lagoa Nova University Campus. ZIP: 59078-900. Natal, Rio Grande do Norte, Brazil.
malu.luizaag@gmail.com