

CHEMICAL WASTE MANAGEMENT BY NURSING STAFF IN AN ANTINEOPLASTIC CHEMOTHERAPY UNIT

O TRABALHADOR DE ENFERMAGEM FRENTE AO GERENCIAMENTO DE RESÍDUO QUÍMICO EM UNIDADE DE QUIMIOTERAPIA ANTINEOPLÁSICA

EL TRABAJADOR DE ENFERMERÍA FRENTE A LA GESTIÓN DE RESIDUOS QUÍMICOS EN UNA UNIDAD DE QUIMIOTERAPIA

Fabiola Carvalho Almeida Lima Baroni ¹
Juliana Cristina de Melo Oliveria ²
Gilberto de Lima Guimarães ³
Selme Silqueira de Matos ⁴
Daclé Vilma Carvalho ⁵

¹ Doctorate in Nursing. Professor. Basic Nursing Department. School of Nursing, Federal University of Minas Gerais, Belo Horizonte, Brazil. Member of the Group of Studies and Research on the Systematization of Nursing Care – NEPESC/EE – UFMG. Belo Horizonte, MG – Brazil.

² RN. Specialist in oncology nursing. Member of the Group of Studies and Research on the Systematization of Nursing Care – NEPESC/EE – UFMG. Belo Horizonte, MG – Brazil.

³ Doctorate in Nursing. Professor. Basic Nursing Department. School of Nursing, Federal University of Minas Gerais, Belo Horizonte, Brazil. Member of the Group of Research on Education, Health and Nursing. School of Nursing Anna Nery (EEAN). Federal University of Rio de Janeiro. Rio de Janeiro, RJ – Brazil.

⁴ Doctorate in Nursing. Professor. Basic Nursing Department. School of Nursing, Federal University of Minas Gerais, Belo Horizonte, Brazil. Member of the Group of Studies and Research on the Systematization of Nursing Care – NEPESC/EE – UFMG. Belo Horizonte, MG – Brazil.

⁵ Doctorate in Nursing. Professor. Basic Nursing Department. School of Nursing, Federal University of Minas Gerais, Belo Horizonte, Brazil. Member of the Group of Studies and Research on the Systematization of Nursing Care – NEPESC/EE – UFMG. Belo Horizonte, MG – Brazil.

Corresponding Author: Gilberto de Lima Guimarães. E-mail: drgilberto.guimaraes@hotmail.com

Submitted on: 08/17/2011

Approved on: 06/18/2013

ABSTRACT

Nursing staff should be prepared for the appropriate management of chemical waste from antineoplastic chemotherapy, because it presents risks to the health of staff, patients, and the environment. Objective: To identify the knowledge of nursing staff on chemical waste management. Methodology: It was a descriptive and exploratory study, performed in an oncology service at a large philanthropic hospital in Belo Horizonte, Minas Gerais. The sample was composed of nine nursing professionals. Data were collected through a questionnaire and field observation. Results: Nursing staff classified and packed chemical waste erroneously. Conclusion: The knowledge of the nursing team about waste management was compromised.

Keywords: Medical Waste; Nursing; Drug therapy.

RESUMO

Os trabalhadores de enfermagem deverão ser instrumentalizados para o adequado manuseio dos resíduos químicos provenientes de quimioterapia antineoplásica, pois estes apresentam riscos para a saúde do trabalhador, do paciente e para o meio ambiente. Objetivo: identificar o conhecimento dos trabalhadores de enfermagem sobre o gerenciamento dos resíduos quimioterápicos antineoplásicos. Metodologia: estudo descritivo e exploratório desenvolvido em serviço de Oncologia pertencente a hospital filantrópico de grande porte, na cidade de Belo Horizonte, no estado de Minas Gerais. A amostra foi composta de nove integrantes da equipe de enfermagem. Os dados foram coletados mediante a aplicação de questionário e observação de campo. Resultados: os trabalhadores de enfermagem classificaram e acondicionaram de maneira errônea os resíduos químicos. Conclusão: o conhecimento dos trabalhadores de enfermagem mostra-se comprometido frente ao gerenciamento do resíduo.

Palavras-chave: Resíduos de Serviços de Saúde; Enfermagem; Quimioterapia.

RESUMEN

Los enfermeros deben estar preparados manejar adecuadamente los residuos químicos de la quimioterapia debido a los riesgos que éstos representan para la salud del trabajador, del paciente y del medio ambiente. En este estudio se ha buscado identificar el conocimiento del personal de enfermería en la gestión de dichos materiales. Se trata de una investigación exploratoria descriptiva realizada en el servicio de oncología de un importante hospital filantrópico de Belo Horizonte, Minas Gerais. La muestra consistió en nueve enfermeros de la Unidad de Oncología. Los datos fueron recogidos a través de una encuesta y de observación de campo. Los resultados indicaron que los enfermeros clasificaban y embalaban los residuos químicos de forma equivocada. Se llegó a la conclusión de que el conocimiento de los enfermeros no era suficiente para manejar dichos residuos.

Palabras clave: Residuos Sanitarios; Enfermería; Quimioterapia.

INTRODUCTION

Since the earliest times of human existence, man has been producing various types of waste, and only contemporaneously has consciousness been awakened to recognize the link between his way of life, the environment and health. The recognition of this relationship now requires a new way of human action, a fair and fraternal relationship required by Gaia.¹

Among the various actions aimed at this relationship and at minimizing the whole issue on waste, normalizations are noteworthy. In Brazil, the National Solid Waste Plan (PNRS) deals with the guidelines for integrated management and solid waste management, including hazardous items. According to this plan, chemotherapeutic waste (CW), the object of this study, can be classified as waste, as Health Services Waste (HSW) based on its origin, and as hazardous due to its characteristics of toxicity, pathogenicity, carcinogenicity, teratogenicity and mutagenicity, and should be regulated by the National Environment System (SISNAMA) and the National Sanitary Surveillance (SNVS).²

For the prevention of potential risks to public health and to the environment, the National Health Surveillance Agency (ANVISA)³, the organizational regulator of health institutions, through Resolution N. 306/2004, and the National Environment Council (CONAMA)⁴, the organization that regulates the environment, through Resolution N. 358/2005, have established conditions for all health service organizations to manage their waste.

The physico-chemical and biological nature of CW requires the establishment of minimum requirements for its proper management by assisting units, according to: specific methods of classification, segregation, packaging, storage, collection, transportation, treatment and final disposal. Also, when possible, minimizing or pretreatment, decreasing the damage to workers' health and the environment.⁵

Regarding worker's health, exposure to waste from these drugs can cause headache, dizziness, nausea, alopecia and even mutagenic, carcinogenic and teratogenic effects. These effects are often comparable to those suffered by patients themselves and have been observed in health workers who prepare, administer or manipulate these drugs, particularly when they do not use personal and collective protective equipment.⁶ The typical routes of exposure to this waste are: inhalation, dermal, oral, and injuries from sharps.⁷

Therefore, when considering the potential risks (cytotoxic, mutagenic, carcinogenic, fetotoxic) in handling CW,⁸ the importance of education of health workers should be taken into account, with the aim of training for proper management and to ensure a high level of safety.⁷

The rationale of this study is centered on the premise that researchers started valuing the relationship between health and the environment. They recognize that the effective management of HSW has strong ethical implications for the pragmatic exercise of

care. However, from the discussions with nursing graduate students in the field of oncology, reflections on the difficulties encountered in professional practice emerged with regard to compliance with the existing laws for the management of chemotherapeutic waste. These reflections led to the need to know the knowledge of health-care staff about the issue of chemotherapeutic waste.

From the dialogical reflective movement, the researchers formulated the following question: What is the knowledge of the nursing staff about the management of chemotherapeutic waste based on the standards of the ANVISA RDC 306/04 and CONAMA Resolution 358/05?

In order to obtain an answer to this question, the study aimed to identify the knowledge of nursing staff about antineoplastic chemotherapeutic waste management.

METHODS

This was a descriptive exploratory study. This method aims to describe the characteristics of certain phenomena and to establish relationships among variables, providing an overview about a certain fact.⁹

The research was performed in the antineoplastic chemotherapy service of a large general hospital in Belo Horizonte, state of Minas Gerais. This hospital was chosen because of the professional experience of the researchers and the concern of the institution manager to know the actions used by the nursing team for the management of antineoplastic drugs waste, regarding government resolutions.

The population was composed of ten nursing staff from the chemotherapy service. One staff member was excluded because he was on vacation when the study was developed. Thus, the sample consisted of nine (90%) staff members.

The data collection period was from September to October, 2006. A two-part questionnaire was used. The first part included demographic data (gender, age, education, professional category, and time in practice); the second part included ten objective questions. These questions were divided into three groups: a) knowledge of nursing staff about waste classification; b) knowledge of nursing staff about packaging of sharp and non-sharp waste contaminated by antineoplastic drugs, and, c) the role of continuing education for nursing practice.

Data were statistically analyzed and discussed in accordance with the law, and based on scientific-technical literature on antineoplastic chemotherapeutic waste.

In addition to the questionnaire, field observation was used to obtain a descriptive report on the actions observed by the researchers regarding the management of waste by staff, having as a parameter ANVISA RDC 306/04 and CONAMA Resolution 358/05. Field observation allowed further elucidation between discourse and practice of staff in that service.

The study followed Resolution N. 196/96 of the National Health Council (CNS), and was approved by the institutional Ethics and Research Committee, under protocol number 161/06 on 08/31/2006.

RESULTS AND DISCUSSION

Sociodemographic data obtained from the first part of the questionnaire were: gender, age, education, professional category, and time in practice. The sample, which represented 90% of the total workforce, had the following characteristics: one nurse, five nursing technicians, and three nursing assistants. Most were female (88%), which was expected, since nursing is typically a female profession. Their ages ranged between 21 and 53 years, however, most respondents (67%) were older than 32 years. With regard to the time in practice in antineoplastic chemotherapy service, 67% of the professionals had over five years, and 33% had worked for less than two years. Regarding education, 88% had completed high school and 12% higher education.

All of the participants reported handling and administering chemotherapy as their activities. Although ANVISA normalizes the preparation and administration of antineoplastic therapy as the responsibility of trained health professionals with higher education¹⁰, it was found that the hospital did not comply with the legislation (Figure 1).

Data obtained in the second part of the questionnaire were divided into three groups, namely:

- a. knowledge of nursing staff about waste classification;
- b. knowledge of nursing staff about packaging of sharp and non-sharp waste contaminated by antineoplastic drugs;
- c. the role of continuing education for nursing work. They are presented below:

Regarding the classification, all staff stated there were different groups and subgroups of waste, and classified them as: infectious (5), toxic (4), antineoplastic drugs (3), not contaminated with chemotherapy (2), contaminated with chemotherapy (1). Thus, they demonstrated difficulty adopting the nomenclature of the legislation (Figure 1).

According to RDC 306/2004, the classification of HSW covers the following groups: A – Potentially infectious waste; B – Chemically risky waste; C – radioactive waste; D – common and recyclable waste; E – sharps waste.³

Chemotherapeutic waste residues belong to group B. However, one cannot ignore that any hospital article which has direct contact with chemotherapy should be considered contaminated by it, and therefore also belongs to group B.

Regarding the classification of waste, specifically chemotherapeutic drugs and products contaminated by them, respondents identified them as those from saline drips with che-

motherapeutic drugs (100%), gloves and catheters used for chemotherapy administration (60%); materials such as syringes, needles, needle covers, caps, tape, cotton and gauze contaminated by chemotherapy (39%). It is noteworthy that only 1% indicated the need to segregate and separately pack all materials contaminated by chemotherapy.

KNOWLEDGE OF NURSING STAFF ABOUT WASTE CLASSIFICATION

The purpose of the classification is to guide the appropriate management of waste, in order to provide more protection to staff and the environment. It allows disposal of waste according to its specificities, preventing contamination of large amounts of common waste by a small amount of dangerous material.^{3,4} That implies the collaboration and commitment of all involved.¹¹

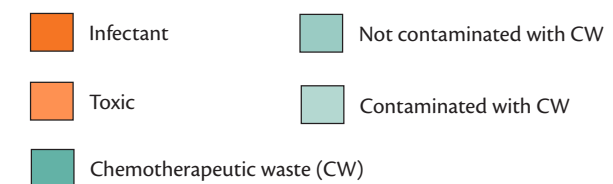
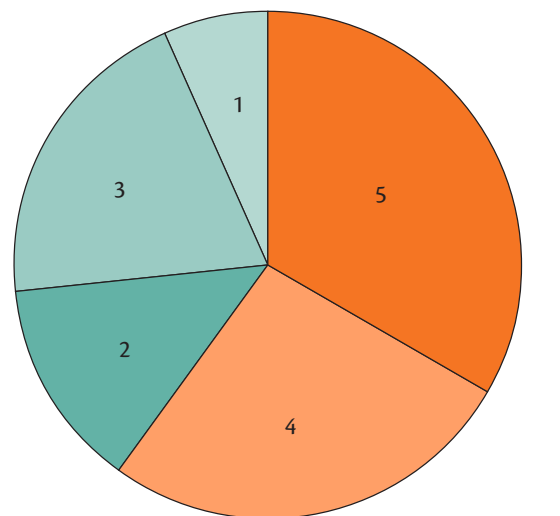


Figure 1 - Classification of the groups of wastes.

However, inappropriate classification was committed in the later stages (segregation, packaging, storage, collection, transportation, treatment and final disposal). The ambiguity expressed in the responses to the questionnaire was expressed in care practice, producing mistakes regarding management, evidenced by the field observation, especially in the stages of segregation and packaging of HSW.¹¹

The knowledge of the respondents was insufficient to establish, in care practice, appropriate attitudes towards waste

management. Their professional action constituted a serious problem for public health and, in spite of the ethical issue, revealed a mismatch with the ideals of nursing.

KNOWLEDGE OF NURSING STAFF ABOUT PACKAGING OF SHARP WASTE AND NON-SHARP WASTE CONTAMINATED BY ANTICANCER CHEMOTHERAPY

Respondents reported using as containers for disposal of sharp waste contaminated with anticancer chemotherapy the rigid material (88%) and carton (12%).

According to the ANVISA Resolution mentioned, containers for packaging of this type of waste must be of rigid material, suitable for each kind of chemical substance, according to its physical-chemical characteristics and physical state and identified in accordance with Art. 32 of that technical regulation. The container must also be compatible with the volume of waste generated.

When considering the data on packaging of sharp waste contaminated with chemotherapeutic drugs, it was found that professionals had partial knowledge about the practice. This situation was confirmed by field observation. Therefore, knowledge of the subjects had flaws, producing a safe and long-lasting professional action.¹¹ The reasons for this occurrence were multifactorial, however, some studies show that the difficulty of acceptance in meeting certain safety measures remains striking in nursing staff.¹¹

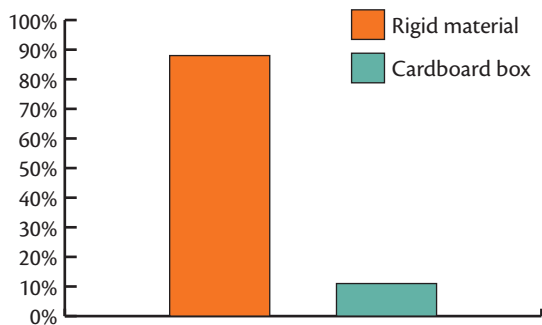


Figure 2 - Containers used for packaging of the sharp objects waste contaminated with CW.

In addition to the responses, two pieces of evidence from the field observation attested to the gap between what the staff said and their practice. The first was the realization that the container for common waste contained material contaminated by CW. It is known that the empty bottles of anticancer chemotherapy, saline bottles, catheters, gauze, cotton and gloves contaminated by it must be discarded in plastic bags of 9µ and deposited in containers identified as toxic material.¹² The second was the disrespect by the staff when continuing to use the white trash bag when its volume exceeded 2/3 of its full

capacity.^{3,5} Thus, workers were exposed to contamination by CW, as well as the environment, the patient and other health professionals. By doing so, nursing staff not only failed to comply with the security measures, but also demonstrated the lack of knowledge about the occupational and environmental risks inherent in the activity which they performed.

Conceptually, occupational risk is the probability of a well defined event harmful to health, to operational units, or causing economic/financial damage to occur in time and space. Chemical occupational risk is a defined event of contamination.¹³ For nursing, this occurrence is significant, because it is one of the major professional categories subject to exposure.¹⁴

Nursing is the category that presents with the highest prevalence of work accidents, sick leave and, sometimes, disability¹⁵. Therefore, knowing the variables that may be associated with occupational risk will enable the adoption of preventive measures to abolish the cases of work accidents¹⁵. Meanwhile, inadequate management reinforces the lack of incorporation of the waste management plan in health services.^{15,16}

ROLE OF CONTINUING EDUCATION FOR NURSING WORK

When asked about whether or not they have received training on the management of waste, 87.5% responded positively and 12.5% negatively.

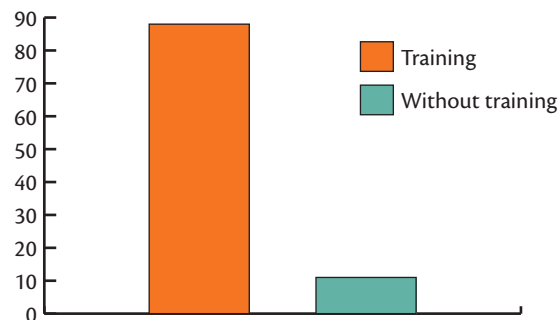


Figure 3 - Training received for management of waste.

Although most claim to have received information for waste management, when the responses to the questionnaire were assessed and compared with the field observation, inappropriateness was detected with regard to ANVISA RDC 306/04 and CONAMA Resolution 358/05.^{3,4}

Scientific knowledge has the value of truth for human beings. It is natural to seek it, because humans are not satisfied with deception. Therefore, knowledge has the prerogative of rectifying professional actions. From the point of view of education, staff who do not use scientific knowledge to build new attitudes remain deceived. This deficit requires correction through education.¹⁷

Furthermore, considering that 12.5% reported not being trained to deal with waste management, there is a gap between the role of continuing education and nursing work in the unit.

Continuing education is considered an essential component of human resources training and development in institutions. The possibility of transformation of professional actions and increased level of professional satisfaction are built through it.¹⁸

It is the nurse's duty, as leader of the nursing staff, to mobilize resources so that institutional access to continuing education is feasible. By doing so, nurses can recognize human capital as the most important element for the functioning of any company, public or private.^{18,19}

Thereby, continuing education is a dynamic process of teaching and learning to upgrade and train staff in the face of scientific-technological progress, social needs, objectives and institutional goals. Thus, continuing education must be seen as part of a comprehensive qualification of health workers, focusing on the needs of practice transformation.¹⁷⁻¹⁹

CONCLUSION

In conclusion, it can be stated that the knowledge about waste management by the study subjects was compromised, especially regarding waste chemotherapeutic drugs, based on ANVISA RDC 306/04 and CONAMA Resolution 358/05.

An incontestable fact is that inadequate management of waste chemotherapy by nursing staff may predispose them to occupational risks (cytotoxic, carcinogenic, mutagenic and teratogenic effects), as well as other members of the healthcare team, the patient, and the environment.

By identifying the activities performed by nursing staff, the inadequacy of the technical-scientific knowledge that supports care practice was emphasized. Thus, continuing education of workers might constitute a tool for the transformation of the practice as it may sensitize them to the construction and promotion of new attitudes. This measure will provide the opportunity to see the birth of critical consciousness and ethical action, which can lead to the assessment of health and environment, enabling them to transform the pragmatics of care.

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