ORIGINAL ARTICLE

PROFESSIONAL NURSING ROUTINE IN WORKING WITH HEALTH WASTES AT A PUBLIC HOSPITAL

ROTINA DOS PROFISSIONAIS DE ENFERMAGEM NO TRABALHO COM RESÍDUOS EM SAÚDE EM UM HOSPITAL PÚBLICO

RUTINA DE LA ENFERMERÍA PROFESIONAL EN EL TRABAJO CON LA BASURA EN LA SALUD EN UN HOSPITAL PÚBLICO

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ABSTRACT

Objective: to analyze the routines of nursing staff regarding the handling of health solid waste. Method: cross-sectional study, with a quantitative approach. A questionnaire was applied to 17 nursing professionals distributed in the sectors of medical and surgical practice at a public hospital. A characterization of the study population was performed through the distribution of frequencies, averages, medians, standard deviations, Odd ratio and confidence intervals (95%). The project was approved by the Ethics in Research under Protocol: CAAE - 0367.0.213.000-11. Results: 88% of the nursing professionals knew of the Solid Health Waste Management Program and 70% received training for it. Comparing the information that only 11(65%) are classified and discard the waste correctly and 6 (35%) wore the Personal Protective Equipment (PPE). Conclusion: there is a need to raise awareness among nursing professionals to adopt the use of PPE in order to minimize environmental effects as well as occupational risks. Descriptors: Use of Solid Wastes; Occupational Risks; Environmental Risks; Occupational Accidents; Nursing Team.

RESUMO

Objetivo: analisar a rotina da equipe de enfermagem quanto à manipulação de resíduos sólidos de saúde. Método: estudo descritivo, transversal, com abordagem quantitativa. Foi aplicado um questionário para 17 profissionais de enfermagem distribuídos nos setores de clínica médica e cirúrgica de um hospital público. Foi realizada a caracterização da população estudada por meio da distribuição de frequências, médias, medianas, desvios-padrão, Odd ratio e intervalos de confiança (95%). O projeto foi aprovado pelo Comitê de Ética em Pesquisa sob CAAE - 0367.0.213.000-11. Resultados: 88% dos profissionais de enfermagem conheciam o Programa de Gerenciamento de Resíduos Sólidos de Saúde e 70% receberam treinamentos. Comparando as informações que apenas 11(65%) classificam e descartam corretamente os resíduos e 6 (35%) usavam os Equipamentos de Proteção Individual (EPIs). Conclusão: há necessidade de sensibilizar os profissionais de enfermagem a adotarem o uso de EPIs com o intuito de minimizar os efeitos no meio ambiente e os riscos ocupacionais. Descritores: Uso de Resíduos Sólidos; Riscos Ocupacionais; Riscos Ambientais; Acidentes de Trabalho; Equipe de Enfermagem.

RESUMEN

Objetivo: analizar la rutina del equipo de enfermería en relación con el manejo de desechos sólidos de la salud. Método: estudio descriptivo transversal, con abordaje cuantitativo. Se aplicó un cuestionario para 17 profesionales de enfermería distribuidos en las áreas de la medicina y la cirugía en un hospital público. Se realizó para caracterizar la población objeto de estudio a través de la distribución de frecuencias, medias, medianas, desviaciones estándar, Odd ratio e intervalos de confianza (95%). El proyecto fue aprobado por el Comité de Ética en Investigación bajo protocolo CAAE - 0367.0.213.000-11. Resultados: el 88% de las enfermeras conocían el Programa de Gestión de Desechos Sólidos de la Salud y el 70% recibieron una formación. Contrastando la información que sólo 11 (65%) clasifican y desechan adecuadamente los residuos y 6 (35%) utilizan el Equipamiento de Protección Personal (EPPs). Conclusión: existe la necesidad de sensibilizar a las enfermeras a adoptar el uso de EPPs con el fin de minimizar los efectos sobre el medio ambiente y riesgos laborales. Descriptores: Use of Residues Solids; Occupational Risks; Environmental Risks; Occupational Accidents; Nursing Team.


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INTRODUCTION

The emergence of the human species brought environmental impacts to nature in which in the binning was surmountable. However, with the increase of the world population and its development, from the Industrial Revolution, these impacts come to produce more compelling effects due to the exploitation of natural resources with a greater intensity.1

This process continues today and is due to the constant search for resources for the creation of materials for their sustenance, the process that is done, most of the times, incorrectly, causing an environmental imbalance.1,2 Man has increasingly produced more garbage discarding it improperly, thus generating a direct impact on the environment and public health.1

In this context, we highlight the waste of healthcare services that are highly infective and without commercial value.1 Known as Solid Medical Waste (SMW) all waste generated by health professionals, being in the hospital environment, dental or pharmacy, which has the potential of risk by the presence of biological material capable of causing infection. Among these we may mention piercing objects effective or potentially contaminated, radioactive waste, chemicals that require specific packaging care, transport, storage, collection, treatment and final disposal.3

Its management is characterized by management methods implemented and planned from technical, scientific and legal knowledge aiming at the reduction and the correct process of waste, ensuring the minimization of occupational risks, protecting public health and the environment. Management of the waste segregation process at its source and at the time of his generation can cause its minimization, especially those that require treatment prior to their final disposal.4

It is defined as a waste generator from Solid Medical Waste (SMW) every service related directly or not, as care for human or animal health. Each generator must establish a Solid Medical Waste Management Plan (SMWPM), which through classifications and characteristics establishes guidelines for processing the waste. The process must be in accordance with local standards and comply with all the steps, such as the handling, segregation, packaging, identification, internal transport, temporary storage, treatment, external storage and collection, and external transport.4,5

The improper disposal SMW generates risks not only to individuals, but also to the environment. The risks can be: direct, large accidents, perceived by the public, chronic, environmentally acute and technological.1

The hospital is a place where numerous wastes are generated daily that and they are not always properly packaged. Difficulties such as the mixture of trash with biological waste, inappropriate exchanging of sharps boxes and garbage bags, professionals accommodated with inadequate practices, neglecting the Ministry of Health standards are some of the problems noted in this context.6,7 The health professionals and patients are extremely important because they are figures inserted in this environment where there are many types of contaminated waste. Due to its importance, the whole process, disposal, storage, collection to final disposal has emerged as a major challenge for our society.6,10

Nursing is one of the major responsible parts for the operation of the SMW flow. This category has a considerable number of professionals involved in various healthcare procedures and, therefore, have daily contact with the wastes. In this context, the accidents with these professionals occur more frequently due to the larger number of activities performed with sharp materials without the proper use of Personal Protective Equipment (PPE).11

Given the above issues some intrigue us when we think about adherence to the SMWPM and its related practices. Do the nursing team professionals know and use the SMWPM in their daily activities? Do they know their rules and their importance? What strengths and weaknesses do the professionals find while adhering to the SMWPM?

Reflecting on these questions it was necessary to investigate this issue due to the great importance of applying the standards established by SMWPM, mainly in hospitals which on daily basis handle large amount of SMW. The SMW process must be carried out properly in the least impactful manner possible, in order to promote the proper functioning of the flow, thus resulting in fewer accidents, reduction of environmental degradation and cost reduction.

OBJETIVO

- To analyze the routines of nursing staff regarding the handling of health solid waste.
METHOD

This cross-sectional study, with a quantitative approach, describes the situation, status of the phenomenon or the relations of this phenomenon in a fixed point, involving data collection in a determined period of time.12

For the data collection a Public Hospital Institution of average complexity was chosen within the metropolitan region of Belo Horizonte, MG, Brazil. This hospital is composed of a: Health Care Unit, Adult ICU, Medical, Surgical and Pediatric Clinics. The study was carried out in the Medical Clinic and Medical Surgical Clinic of this institution due to the large flow of SMW.

The members of the nursing team who work in the fields of Clinical Medicine and Medical Surgical Clinic and who have direct contact with the SMW, were invited to participate in the study; eligible participants must have at least three months of exercising activities in the sector, a minimum time of experience and training of the professional as stated in in Article 445 of the consolidation of Labor Laws (CLT), directed by SMWPM.13

The Medical Clinic sector has 14 employees and the Medical-Surgical Clinical another 10, totaling 24 employees. Of these, 17 agreed to participate in the research. The nursing team professionals in sectors that do not perform activities related to SMW or do not have the minimum time required were excluded from the study.

A questionnaire with questions related to the flow of waste was used, the application of the protocol in the sector, as well as their potential, their weaknesses and their impact on the environment. Questions about sociodemographic data and aspects related to the professionals involved were also addressed. The application of the questionnaire was performed by collaborators of the project, previously trained through visit programs to participating research sectors. The purpose of this schedule is avoid possible contingencies and clarify them, making the completion of the questionnaire in a complete, secure and reliable manner.14 After the data collection, the questionnaire forms shall be stored at secret location for five years to maintain the anonymity of the subjects and possible investigations and after this period they will be destroyed. A characterization of the study population was performed through the distribution of frequencies, averages, medians, standard deviations, Odd ratio and confidence intervals (95%).12

In accordance with Resolution 196/96 of the National Health Council, the data were collected and used only for the stated research objectives, and the information was presented in a collective manner, without any damages to the people involved, especially with regard to the naming of the professionals involved. The data will be kept confidential and secure by researchers, ensuring the basic bioethical principles: autonomy, non-maleficence, beneficence, and justice.15

The participants were provided the Term of Free and Informed Consent Form (ICF), ensuring the ethics of research, as provided for in Resolution 196/96.15 The project was approved by the Research Ethics Committee of the Pontifical Catholic University of Minas Gerais under protocol No. CAAE - 0367.0.213.000 -11.

RESULTS AND DISCUSSION

The participants were 17 professionals aged between 23 and 54 years of age, three nurses and 14 nursing technicians.

◆ Professional contact with the SMWPM

Of these, 15 (88 %) are aware of the prevailing SMWPM in the institution, which demonstrates a commitment by the institution and of the professionals involved in the implementation of the process. Contrasting to this information, other studies demonstrate that a problem found among the health professionals who work with hospital waste and the total lack of knowledge or partial knowledge of the SMWPM.3,8

The science on the correct handling of SMW is the main tool for its correct packaging and discarding. For this it is necessary to have prior knowledge, since the storage, disposal and improper disposal cause environmental and health problems, endangering the health of the population and the environment.6

A good way for the professionals get more information on the SMW would be the creation of a discipline in this area at educational institutions which train the health professionals, and teach how it is done throughout the process of health solid waste. It is important to show students the importance of the various stages of management, in order to reach a greater understanding of the process and consequently a better coping and quality in the process. However, knowledge alone is not enough. In addition to this it is necessary to discuss issues of citizenship in the institutions.
so that the professionals know of their duties with the SMW and form critical thoughts on these duties.\(^6\),\(^16\)

Twelve workers (70\%) received training for handling SMW (GRAPH 1). This process is constant and necessary within hospital institutions, this is being carried out by the Commission of Hospital Infection Control (CHIC).\(^3\)

The team training inserted in the hospital environment is a way of ensuring the proper handling of SMW. According to some authors, the majority of the professionals do not know the protocol on the waste implanted in the institution in which they work, and even what is the correct flow.\(^17\) Thus, it is important to encourage training upon the admission of the professional and also continuously for the management team involved with these wastes.\(^17\) In accordance with the results of a study on the theme, "the team's training is crucial for reducing environmental impacts and ensuring the health of workers, as part of the proper waste of health management".\(^3\) The training of the team must be permanent in order to raise awareness among professionals about their importance in the process of medical waste management.\(^3\)

Nursing as an integral part of the healthcare team must be able to "educate" the professionals in order to promote health in their various ways, by inserting them in the SMW management process. The nurse must empower their team demonstrating the correct handling, storage and final disposal of medical waste, exposing potential risks that the professionals are subject to if there is not a proper commitment to the current protocol.\(^18\)

Treatment and classification of SMW in the institution

Treatment is understood as any process being: manual, mechanical, physical, chemical or biological, that modify the characteristics of the waste, aiming at minimizing the risk to health, safety and health to the worker and preserving the quality of the environment. According to Resolution no. 306/04, treatment is summarized in the application method, technique or process that modifies the characteristics of the waste, thereby reducing or eliminating the risk of contamination, occupational accidents or damage to the environment.\(^4\),\(^7\)

This can be done in the generator establishment or in another location, as long as they are preserved as transport conditions between the generator establishment and the treatment location.\(^7\),\(^19\)

With the implementation of this instrument we found that 11 residues (65\%) investigated receive appropriate treatment in relation to their classification, being that the surgical environment the survey found that 9 waste (53\%) receive the correct treatment.

Another study shows that the residues are often inefficiently segregated, being packed with non-infectious waste and increasing expenditures of the institutions.\(^20\)

In the institution surveyed the vast majority of the respondents (94%) stated that there is a SMW classification system. The solid waste in health are classified according to their potential for infection, and from there, they are processed correctly, because for each class there is a suitable container preventing contamination.\(^4\) it was noticed that 11 professionals (64.7\%) perform the correct disposal (Figure 1). This number is still much lower than desired, because disposal constitutes an essential step for the success of the SMWPM.
Figure 1. Distribution of waste disposal in the proper location in accordance with the classification. Source: Research Data

It can be seen that although there is a classification for waste separation, they are not properly disposed of. This context suggests the need for training and education of professionals involved more effectively, and an awareness of the impact that the incorrect disposal of SMW provides to public health.

♦ Proper SMW packaging at the institution

When questioned on the identification of the SMW bags, 13 respondents (76%) responded that there is an origin and content identification and three (18%) responded that this identification is not constant. The bags for waste storage are intended for packaging waste and must be manufactured so that they are resistant, waterproof and according to NBR 9191 limits the weight of each bag which must be respected, also prohibiting their reuse or emptying.4

The waste identifications must be contained on bags and containers for internal and external collection, with easy viewing where the colors, symbols and phrases must meet the NBR 7500/09 21 these labels allow measurements of recognition of the SMW and direct the correct management of these wastes.

It is important that the waste should be packaged in a correct manner, so that there is a specific routing for each one, avoiding their mixing and consequently possible accidents, and reducing the costs of treatment of materials that do not require it.10

In addition, 13 employees (76%) reported packaging the sharps in rigid container in whole. The literature demonstrates the relevance of this practice since these materials are potential transmitters of infectious diseases.14

Despite the institutions having a correct packaging location, such as descarpack boxes among others, this number is probably insufficient. This practice is of extreme importance for the possibility of separating common and infective waste, in addition to segregate the sharps from the others, since these are potential sources of disease transmission to the workers. In addition, it is important to highlight that the SMW should be packaged in suitable containers no more than 2/3 of its capacity.4

♦ Use of personal protective equipment and accidents related to handling of hospital waste

In our study, only 6 professionals (35.3%) use the Personal Protective Equipment (PPE) (Figure 2). This situation differs from that found in another study, where all the professionals interviewed the researched institution use PPE when handling the SMW.3
This result suggests a possible lack of commitment from professionals with self-care. The PPE are of extreme importance for safe practice, because through them it is possible to protect against the risks found in environments that provide health care. It is essential that in the training of workers dealing with the waste the importance of the use of Personal Protective Equipment (PPE) should be emphasized, how to use them correctly and which must be used for each activity, thus minimizing possible risks.

The risk that a professional submits themself this is related to the possibility of the occurrence of an adverse result of an injury or an unwanted phenomenon. This result may be due to the lack of SMW management, which lead to contamination of the environment, its biological and chemical characteristics as well as the occurrence of accidents involving healthcare professionals.

One way to minimize these risks is the use of PPE, and to ensure their use, it is necessary to be attentive to the routine monitoring of workers, thus ensuring proper use and consequently the promotion of workers’ health.

When the interviewees were asked if they had already suffered some accident related to medical waste, 5 replied that yes (29 %) and 12 (71 %) did not have any accident. Studies show that the majority of accidents at work occur because the professionals are discarding the sharps in inappropriate locations, i.e., containers other than those intended for this purpose.

In spite of the small number of accidents shown, they probably could be avoided. This fact makes us reflect on the lack of commitment or even knowledge of workers on the risks of occupational exposure to human body fluids, which can transmit diseases such as hepatitis B and HIV. It is important that all workers receive the vaccine schedule recommended for their professional and that the institution promotes accident prevention campaigns to the risk associated with a process of continuing education. It is in this context that education plays a crucial role in the development of any service/organization/institution, in order to ensure their survival, innovation and change in the direction of quality/excellence. If the professional suffers from some kind of accident at work it is important that the institution provides the prophylaxis with antiretroviral drugs, being necessary for the prevention of possible injuries.

**Temporary storage location**

Nine respondents (53%) reported the existence of a temporary storage place in their work sector, suggesting an infrastructure that contributes to the proper SMW flow. By definition, it is known as a temporary storage location one place where the temporary custody of the receptacles containing the waste already packaged in convenient location near the generation points, with the purpose of improving the collection within the establishment and the displacement between the generator points and the point intended for external collection. If the distance between the waste generation points and the external storage is small, temporary storage may be properly dispensed.

There is no denying the importance of the existence of temporary storage locations, as this avoids contact with other materials from SMW, vectors and population. These locations optimize and streamline the collection of waste for its final disposal, ensuring more safety for the workers involved in the process.

**SMW Transport**

Ten (59%) of the total number of respondents believe that the institution in
which they work there is an organization for the transport of SMW. The transport is defined as the removal, in special vehicles, for the SMW, the external storage until the treatment unit of final disposition, performed by specialized services licensed by the environmental agency. They must preserve the conditions of preparation and the integrity of workers, of the population and environment.\textsuperscript{7,19}

The professionals involved must use the personal protective equipment and collectively in a proper manner. If there are small accidents, the external collection team itself may perform the appropriate cleaning and disinfection. In the event of large accidents, the company responsible for external collection should immediately notify the components of environmental control and public health.\textsuperscript{7,19} In the investigated sectors 53\% of the employees stated that the type of transport most used in locomotion outside of waste and effect via chest.

The organization of the entire flow management is of utmost importance as well as the transport of the SMW, it contributes to worker safety and lower environmental impact. Care such as, making collections at times of lower influx of people in order to prevent accidents, avoid mixing different types of materials to avoid spending unnecessary treatments proper use of PPE, clothing and waterproof boots, hygiene periodic site packaging and cart collector, are simple ways to ensure the quality and organization of transport of SMW.\textsuperscript{3,9}

\textbf{Factors which hinder the SMWPM}

The main impediment found in this study was the lack of adequate safety equipment (31\%) (Figure 3). It is necessary that the workers have knowledge on the importance of the correct use of PPE for each activity, as well as their need to keep them clean and well kept. It is also important to state that the supervision of the use of PPE is under the responsibility of the employer, as well as availability to all employees.\textsuperscript{3,9}

Other complicating factors found were the absence and the inadequacy of a collection itinerary (24\%) and inadequate collection frequency (24\%). The SMW collections should be performed in shifts and times of lower influx of people and often do not coincide with pre-established schedules for distribution of food, clothes and medicines, or with visiting hours.\textsuperscript{3,9}

Figure 3. Distribution of the major difficulties in handling of SMW. Source: Research Data

\textbf{FINAL REMARKS}

Throughout this process it was possible to identify the importance of SMWPM in a hospital institution and estimate their impact on the health of workers and the environment. Attention must be directed not only to the residues inside the hospital, but also to their final destination.

So that the SMWPM is an efficient and quality service, all the professionals involved in this process should undergo training in the succession management SMW, evaluation, provision of PPE and continuous supervision in handling the waste. Professional training should involve the whole process of understanding and critical reflection of biosecurity standards and environmental preservation of SMW, because the lack of this may entail risks to health professionals and the population. Being carried out correctly, the SMWPM provides risk reduction of occupational accidents, financial cost to the
institution, and therefore a lower impact on health and the environment.

Therefore all agencies involved in the stages of SMWPM must ensure that the process is reliable, promoting safety in the handling of SMW both for professionals and for environmental preservation.

We suggest that further studies are made related to SMWPM, since these are often not addressed in a hospital environment. New approaches and evaluation processes would be interesting to minimize the problems presented in the process and plan effective strategies for the proper handling of medical solid waste by the nursing staff and other professionals involved. Furthermore, they should be inserted in this context of continuing education involved in the environmental impacts caused by improper handling of these wastes, thus ensuring an efficient path to environmental sustainability.

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