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Professionals' perception of solid health-care waste in the hospital context

Percepção de profissionais sobre resíduos sólidos em saúde no contexto hospitalar

Percepción de profesionales sobre residuos sólidos en salud en el contexto hospitalario

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ABSTRACT

Objective: To understand university hospital workers' perception, attitudes and practices in relation to solid health-care waste (SHW). **Methods:** An interview with health professionals was carried out using a descriptive and qualitative methodology in 2019 at a university hospital in the city of Bagé, located in the Campanha Region of the State of Rio Grande do Sul, Brazil. A total of four guiding questions were formulated: (1) knowledge about solid hospital waste; (2) identification of solid hospital waste; (3) routine in the health service when handling solid hospital waste; and (4) understanding of damage caused by solid hospital waste, with the interviewees' reports (n=18) being recorded and transcribed verbatim for content analysis. The following categories emerged: Understanding Solid Hospital Waste; SHW Management Steps; Difficulties and Limitations; and Risk of Inappropriate Disposal. **Results:** The data revealed weaknesses on the subject in terms of concept, management and risks; there is no clarity about the logistics involving SHW; there is a lack of knowledge about the categorization of the different types and the management of SHW, highlighting the lack of understanding of the correct disposal of the SHW generated in the hospital context and signaling the need for training on the subject. **Conclusion:** The difficulties related to the interviewees' knowledge and understanding of the subject were understood and impact their attitudes and practices.

Descriptors: Waste Management; Health Personnel; Health centers.

RESUMO

Objetivo: *Compreender a percepção, atitudes e práticas de trabalhadores de um hospital universitário frente a resíduos sólidos de saúde (RSS).* ***Métodos:*** *Realizou-se, por meio de metodologia descritiva e qualitativa, entrevista com profissionais de saúde em 2019 em um hospital universitário do município de Bagé, situado na Região da Campanha do Estado do Rio Grande do Sul, Brasil. Desenvolveram-se um total de quatro questões norteadoras: (1) conhecimento sobre resíduos sólidos hospitalares; (2) identificação de resíduos sólidos hospitalares; (3) rotina no serviço de saúde ao manusear resíduos sólidos hospitalares; e (4) entendimento sobre danos provocados por resíduos sólidos hospitalares, sendo as falas dos depoentes (n=18) gravadas, com posterior degravação para análise de conteúdo. Emergiram as categorias: Entendimento sobre Resíduos Sólidos Hospitalares; Etapas do Gerenciamento de RSS; Dificuldades e Limitações; e Risco do Descarte Inapropriado.* ***Resultados:*** *Os dados revelaram fragilidades sobre a temática quanto conceito, gestão e riscos; não havendo clareza sobre a logística dada aos RSS; há falta de conhecimento sobre a categorização dos distintos tipos e o gerenciamento de RSS, evidenciando o não entendimento do correto descarte dos RSS gerados no contexto hospitalar, sinalizando para a necessidade de treinamento sobre o tema.* ***Conclusão:*** *Compreenderam-se as dificuldades sobre o conhecimento e entendimento dos entrevistados do presente estudo acerca da temática, impactando em suas atitudes e em suas práticas.*

Descritores: *Gerenciamento de Resíduos; Pessoal de Saúde; Centros de Saúde.*

RESUMEN

Objetivo: *Comprender la percepción, actitudes y prácticas de trabajadores de un hospital universitario frente a residuos sólidos de salud (RSS).* ***Métodos:*** *Fue realizado, por medio de metodología descriptiva y cualitativa, encuesta con profesionales de salud en 2019 en un hospital universitario del municipio de Bagé, ubicado en la Región de la Campaña del Estado del Rio Grande del*

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Sur, Brasil. Fueron desarrolladas un total de cuatro cuestiones norteadoras: (1) conocimiento sobre residuos sólidos hospitalarios; (2) identificación de residuos sólidos hospitalarios; (3) rutina en el servicio de salud al manejar residuos sólido hospitalarios; y (4) entendimiento sobre daños provocados por residuos hospitalarios, siendo las hablas de los deponentes (n=18) grabadas, con posterior transcripción literal para análisis de contenido. Surgieron las categorías: Entendimiento sobre Residuos Sólidos Hospitalarios; Etapas de Gestión de RSS; Dificultades y Limitaciones; y Riesgo de Eliminación Inapropiado. ***Resultados:*** *Los datos mostraron debilidad sobre la temática cuanto al concepto, gestión y riesgos; no habiendo claridad sobre la logística dada a los RSS; hay falta de conocimiento sobre la categorización de los distintos tipos y la gestión de RSS, evidenciando el no entendimiento de la correcta eliminación de los RSS generados en el contexto hospitalario, señalando para la necesidad de entrenamiento sobre el tema.* ***Conclusión:*** *Se comprendieron las dificultades sobre el conocimiento y entendimiento de los encuestados del presente estudio acerca de la temática, impactando en sus actitudes y en sus prácticas.*

Descriptores: *Gestión de Residuos; Personal de Salud; Centros de Salud.*

INTRODUCTION

Population growth is one of the factors that most contribute to the generation of solid waste, representing an emerging problem today. In Brazil, 79 million tons of urban solid waste were produced in 2018, making it the country with the highest generation of waste (541 thousand tons/day) compared to others in Latin America according to the Brazilian Association of Public Cleaning and Special Waste Companies (*Associação Brasileira de Empresas de Limpeza Pública e Resíduos Especiais – ABRELPE*). This context includes solid health-care waste (SHW), with 252,948 thousand tons of SHW being produced in the same year, which is equivalent to 1.2 kg per inhabitant/year[1,2]. Such a high production of SHW has generated significant concern for the health and environment departments of Brazilian municipalities given the risks to public health and the environment[3].

SHW has a varied composition based on the characteristics of the place where it is generated. In the hospital environment, contaminated residues from biological materials, sharps, medicines, among other materials, stand out. The correct management of these residues is essential for the maintenance of health in this environment, since microorganisms contained in SHW contribute to the chain of transmission of diseases, thus increasing the exposure of workers and patients in addition to potentiating virulence and microbial resistance of the etiological agent[4,5]. Furthermore, the continued entry of SHW into the environment, even at low concentrations, leads to an increase in its levels over time, promoting adverse effects on the biota and on exposed humans due to the contamination of effluents and bioaccumulation of chemical elements promoted by the food chain[6].

Reflections on waste production by Brazilian health institutions have been publicized for some time, especially with regard to the correct disposal of SHW to minimize environmental and health impacts. In Brazil, SHW is regulated by the Resolution of the Collegiate Board (*Resolução da Diretoria Colegiada – RDC*) No. 306/2004 of the National Health Surveillance Agency (*Agência Nacional de Vigilância Sanitária – ANVISA*) and RDC No. 358/2005 of the National Council for the Environment (*Conselho Nacional do Meio Ambiente – CONAMA*), which deal with technical and legal guidelines for the management, treatment and final disposal of SHW in Brazil. In addition, Law 12.305, enacted on August 2, 2010, establishes the National Solid Waste Policy in Brazil, which has principles and guidelines related to the waste management program with the aim of developing environmentally adequate management[7-9].

Professional knowledge about the waste generated in health facilities can be the first step towards understanding the dynamics of their correct disposal, enabling the implementation of processes for the management of such waste. Thus, the aim of this study was to understand university hospital workers' perceptions, attitudes and practices regarding solid health-care waste.

METHODS

This study uses a qualitative descriptive methodology[10] and took place in March 2019 in a university hospital in the city of Bagé, located in the Campanha Region of the State of Rio Grande do Sul, 377 km away from the capital Porto Alegre.

This hospital is a philanthropic low-complexity facility that has 49 beds intended mainly for care within the Unified Health System (*Sistema Único de Saúde – SUS*), but it also includes other agreements and private care. It comprises the provision of clinical and outpatient services, and offers exams such as radiography, electrocardiogram, electroencephalogram and hemodialysis services, the latter being outsourced.

The target audience of the research consisted of 38 health professionals randomly interviewed in the three shifts of the hospital during the period of one week in March 2019, a period of transition in hospital management and increase in health management processes.

Prior to the interviews, a pilot interview was carried out by a single researcher to test and correct the data collection instrument. The pilot test was conducted with a health worker at the hospital who was not included in the study sample.

The questions the professionals were asked sought to understand: (1) their knowledge about solid hospital waste; (2) the identification of solid hospital waste; (3) the routine in the health service when handling solid hospital waste and (4) the understanding of the damage caused by solid hospital waste. The interviews were recorded and later transcribed verbatim for analysis of their content[11]. The organizational framework of data analysis involved three stages: pre-analysis, analytical description and inferential analysis. The first stage involved the processes of organizing material and in-depth readings horizontally and vertically; the second stage involved data content description processes in an objective and systematic way; and the third phase involved the data categorization process.

During the data collection period, 18 health professionals participated considering their availability of time in the service.

After analyzing the content of the research participants' reports, four categories were listed for reflection and discussion, which were described as: Waste Destination; Difficulties and Limitations; and Risks of Inappropriate Disposal.

The study complies with Resolution No. 466 of 2012 of the National Health Council[12], which defines the standards for research with human beings in the country. This research integrates partial data from an umbrella project named Pharmacy and Rational Use of Medicines approved by the Research Ethics Committee of the Átilla Taborda Foundation - University Center of the Campanha Region (*Fundação Átilla Taborda - Centro Universitário da Região da Campanha – URCAMP*), Approval No. 102092/ 2018

To maintain the anonymity and privacy of the participants, codes and numbers were assigned to the participants. The numbering followed the order of the interviewees and participants were coded with the first letters of the profession as follows: doctor as DOC1 (...), nursing technicians as NT1, NT2 (..), pharmacist as P1 (...), nurse as NUR1 (..), nutritionist as NUTRIT1 (..), hygiene staff as HYG (...), general services as GS1 (..), social worker SW1 (..), pharmacy clerk as PC1 (..), administration employee as ADM1 (..), laundry staff as LAUND1 (..), and so on.

RESULTS AND DISCUSSION

Eighteen health professionals participated in the research, including one doctor, two pharmacists, one nurse, six nursing technicians, one nutritionist, one social worker, one pharmacy clerk, one administration employee, two hygiene employees, one laundry employee and one general services employee.

After analyzing the content of the research participants' reports, four categories emerged, namely: Understanding of Solid Hospital Waste; Waste Destination; Difficulties and Limitations and Risks of Inappropriate Disposal.

Understanding of Health Services Waste

This category describes the subjects' understanding of what came to mind when asked to explain what solid hospital waste was, with the breadth of their understanding being exposed in subsequent reports.

The following statements confirm the above:

"Solid waste is expired medicines. Expired Medicines." (PC1)

> *"Cotton, syringes, needles; (...) scraps of paper that are handled, plastics for the packaging of medicines." (NT3)*
> *"Empty vials, glove, medicine vials." (NT4)*
>
> *"Any and every waste ranging from nursing materials and varied and expired medicines." (P1)*
>
> *"It's all those food scraps, which are collected in the rooms or even in the cafeteria. They are reserved outside, they are in the sluice room where they are called contaminated waste: blood-stained gauze, needles, even feces from a patient with a disease such as hepatitis." (HYG1)*
>
> *"Any hospital material that has had direct or indirect contact with sick people. Syringes, equipment, medication vials already used." (DOC1)*
>
> *"Hospital waste, syringes, contaminated waste, papers, IV containers." (GS1)*

According to Law No. 12.305, of August 2, 2010, which establishes the National Solid Waste Policy and amends Law No. 9.605 of February 12, 1998, hospital solid waste is defined as any material, substance or object resulting

from human activities in society whose final destination in solid, semi-solid, liquid or gaseous states makes its release into the public sewage system or into bodies of water unfeasible as they are harmful to health or the environment[13].

The universe of hospital waste can be produced in health centers, consisting of common waste, infectious or biological risk waste and special waste. Therefore, it is categorized as health services waste in Group A, which includes waste with the possible presence of biological agents and which may present a risk of infection, such as blood, tissues and viscera; in Group B, encompassing residues containing chemical products that may present a risk to public health or the environment depending on their characteristics of flammability, corrosivity, reactivity and toxicity, represented by chemical substances, such as expired or banned drugs, thermometers and sharp objects; in Group C, represented by radioactive waste; and finally in Group D, referring to waste that does not present a biological, chemical or radiological risk to health or the environment and that can be assimilated to household waste, represented by uncontaminated common waste such as paper, plastic, glass, food leftovers and packaging[8,12].

The World Health Organization (WHO) has argued that hospital waste is special, and that some categories of this waste are among the most dangerous of all waste produced in the community and can have serious consequences for public and environmental health if improperly managed[14].

Pharmaceutical waste was mentioned by professionals “PC1, P1, NT3 and DOC1”. Classified as Group B, it is among the health services waste (SHW) that deserve to be highlighted as a public health problem since it is generated not only in hospitals, clinics, pharmacies, drugstores and health centers, but also in most households[15]. Waste originated from the preparation and use of medicines, as well as unused fractions thereof, is classified as hazardous and must be treated with due care[13]. In this context, the final destination of drug waste is a relevant issue for public health and environmental health due to the pharmacological activity of drugs that will eventually become waste[15].

Part of the professionals interviewed in the present study had a good perception of what SHW is, but some reports show the lack of knowledge about the categorization of the different types of SHW. This can be observed when two interviewees (NT3, GS1) confuse solid biological waste in health with materials that should be specific to common waste, uniting them in the same concept. Thus, they perceive that papers or plastics involving inputs or medicines are also considered solid health-care waste, according to current legislation, highlighting the need for the correct destination of each waste[12]. Also, the inclusion of food, mentioned by the participant HYG1 as being a solid health-care waste, was presented as the report that most contrasted in relation to the hegemony of the perceptions of the other interviewees. Perhaps this fact is attributed to dealing directly with the hygiene of patients’ rooms, where food can be placed in common trash.

A quantitative study carried out with professionals from the nursing team of a clinic to assess knowledge about SHW showed that 50% of the interviewees knew how to correctly identify it, and 60% knew the current legislation on the classification of solid waste, suggesting permanent training and education in relation to the subject[17]. A qualitative research, on the other hand, observed that professionals, especially in the area of Nursing (nurses, nursing technicians and nursing assistants), as it is the profession that most provides direct care to the patient, had a better understanding of the SHW, both in terms of the concept and the current legislation and segregation[18].

Solid waste management steps

The second category described refers to the participants’ knowledge about the destination of waste generated in the work environment in relation to daily practices, also considering the stages of SHW management.

It can be observed, in general, that the final destination given to sharps is the most remembered practice, exemplified in the reports of professionals NT1 and HYG1; however, a more detailed knowledge about the internal management of SHW is mentioned only by the employee linked to the hospital administration (ADM1), denoting that the other professionals with a higher education degree are not clear about the logistics involving SHW in the studied place, as noted below:

> *“Disposing it into “descarpak” boxes for being collected right after.” (NT2)*
>
> *“What is sharp goes to “descarpak”, the IV containers are placed into regular waste bags, and what is stained with blood goes to the contaminated waste.” (HYG1)*
>
> *“In the center where I work, there is only common waste, there is no pharmaceutical waste.” (NUTRIT1)*
>
> *“I don’t know how to answer.” (NT5)*
>
> *“Contaminated waste is collected at the centers and stored in bambonas (plastic containers), which will later be discarded by the company in charge.” (ADM1)*

Solid waste management comprises a set of management procedures, planned according to normative and technical guidelines, which aim to reduce waste production and provide the correct destination, aiming at the protection of health professionals and the preservation of public health, natural resources and the environment. According to their characteristics and their classification in groups and in volume, the generated health services waste must be managed according to the Health Services Waste Management Plan (*Plano de Gerenciamento de Resíduos de Serviços de Saúde – PGRSS*). This plan establishes guidelines and management standards for this type of solid waste[18].

The process involves the internal and external management of SHW, comprising the steps: (a) minimization: it represents the first aspect to be considered within the concept of preventing the occurrence of environmental impacts, and consists of reducing the generation of solid waste; (b) segregation: consists of separating waste according to its classification, produced at the place of its generation; (c) packaging: the packaging of waste must be carried out in containers that do not cause ruptures and leaks; (d) identification: the waste, after being packaged, must be identified with the expression and specific symbol for each type of solid waste produced; (e) collection and internal transport: consists of removing plastic bags from the place where they are generated to their storage location, using exclusive vehicles for this purpose; (f) intermediate and temporary storage: it consists of storing the waste in a safe way in appropriate places of the facility where it was produced; (g) collection and external transport: the collection of waste must be carried out daily, with permission to be carried out at least three times a week. Waste must be collected with specific equipment for each type of waste. External transport must be carried out in the shortest possible route to avoid accidents and spills; (h) treatment: the treatment of waste is a procedure carried out within the health unit that generates the waste, the treatment methods being carried out according to the characteristics of all waste produced, comprising recycling, sterilization, composting, incineration, chemical treatment and ionization; (i) disposal and final destination: consists of disposing solid waste in appropriate and prepared places[19].

Solid waste generated in health services requires special attention from health professionals and managers, as the inadequacy of its disposal can cause damage to the environment and serious damage to the health of the population. Inadequate management of these wastes can impact the environment by contaminating the water table and causing hospital infections due to the spread of resistant microorganisms[20]. Therefore, the danger of hospital waste leads to the implementation of differentiated and specific systems for its collection, but operational costs are involved in this process[21].

The responses of the interviewees in the present study denoted a lack of knowledge about SHW management, as most subjects reported only the “descarpack”, signaling the lack of understanding of the logistics of the correct disposal of SHW generated in the hospital context. The identification of specific bins for the disposal of common and contaminated waste was in the process of being implemented in the hospital visited at the time of the interviews, which may have made it difficult.

According to ANVISA RDC No. 222, of March 28, 2018, which provides for the requirements for good practices in the management of health services waste, the procedures related to the Management of Solid Health-care Waste (*Gerenciamento de Resíduos Sólidos em Saúde – GRSS*) are under the responsibility of the individual waste generator; thus, the supply of inputs, physical structure and adequate containers for the correct segregation and disposal becomes essential to enforce the current legislation[13]. It was observed that resources for the correct segregation were not within the reach of health professionals due to the lack of flowcharts and standard operating procedures for the destination of SHW and of bins for the disposal of the different waste generated. This reality was also reported in Primary Health Care (PHC) Centers, where professionals mention some difficulties for the correct disposal of SHW, including the absence of materials and supplies not available in sufficient quantity and also the lack of an appropriate place, making it difficult to have an internal management process until the collection of the waste[18].

Difficulties and Limitations

The difficulties and limitations faced by the professionals were listed based on the questioning about the daily routine of the professional in the process of segregating SHW, considering whether or not it was carried out in accordance with the legislation or if there had been any information in the service about the management of SHW.

In view of the difficulties related to the correct disposal of solid hospital waste listed by the professionals, it was observed that they notice the need for training on the subject, as reported by HYG2 and NUTRIT1, while others referred to the lack of knowledge on the subject, as mentioned by NT2, P1 and NUR1. However, others did not verbalize difficulties in relation to this practice (NT4, PC1), as noted in the following reports:

> *“There was no training whatsoever. There have been lectures, but no training to work.” (HYG2)*
>
> *“Lack of training for employees.” (NUTRIT1)*

"The difficulties are many, because most of the time the person was not instructed to dispose them correctly." (NT2)

"Employees' awareness of the importance of correct waste disposal." (P1)

"Lack of attention and knowledge on the part of some professionals." (NUR1)

"There is no difficulty, as we dispose the vials in one place and antibiotics in another." (NT4)

"There is no difficulty at all inside the pharmacy, everything is segregated." (PC1)

It appears that there is a controversy among the interviewees, as some reported having no difficulty (PC1, NT4), while others indicated a lack of guidance on that (HYG2, NT2). The lack of information and training was presented by more than one interviewee, with one of them reporting having witnessed only one lecture on the subject until the moment of the interview. Another study that assessed the main difficulties faced by nursing professionals in relation to the management of SHW identified fragility in the handling system, the place for disposal and lack of information in addition to other factors that interfere with the failure to carry out the correct disposal, such as the lack of attention, time, and training or information[17].

This investigation highlights the need to implement education strategies aiming to minimize health and environmental problems arising from the incorrect disposal of SHW[18].

Health professionals have difficulties because of the absence or lack of training on solid waste management within the hospital institution. The factors that interfere with the failure to carry out solid waste management are associated with the lack of training, and even the inclusion of this content throughout professional training[15,18].

Continuing education, which emphasizes updating and improvement to keep up with changes, can be carried out through postgraduate courses, training, courses and technical improvement, as its lack limits professionals to the possibility of knowing the GRSS process[22]. Spaces for reflection in everyday care can produce changes in the reality of work, so the human resources sector can promote training programs as an integral part of the Solid Health Services Waste Management Plan[17].

It should be noted that the period of data collection in the current study culminated with the transition of hospital management, in which issues related to management processes were being addressed and implemented. Considering the implementation of the Health Services Waste Management Plan (*Plano de Gerenciamento de Resíduos de Serviços de Saúde – PGRSS*), it had already been written, but it was still being improved and it was not being widely disseminated in the form of internal training, which may have compromised the knowledge of health service workers when asked about the subject in question.

PGRSS is a set of planned management procedures whose objective is to minimize the production of waste and provide for the efficient forwarding of SHW to the responsible company, which must give the correct destination to it with the aim of providing protection to the worker and preserving the public health and the environment. It should consider the characteristics of waste, quantity, classification, segregation, packaging, temporary storage, transport, treatment technologies, forms of final disposal and control programs at the source[20].

Hospitals already have waste management programs and training of the professionals involved, but such actions still have flaws, with inadequate disposal in the bins possibly due to lack of knowledge and/or educational training focusing on the importance of this theme. It should also be noted that the cost of correct final disposal of waste is high for the health institution[21].

The National Health Surveillance Agency (*Agência Nacional de Vigilância em Saúde – ANVISA*) published RDC No. 306/04, which provides for the need for continuing education to guide, motivate, raise awareness and permanently inform all those involved about the risks and adequate management procedures in accordance with the precepts of waste management. Thus, the services that generate SHW must maintain a continuing education program, regardless of the professional's employment relationship[7].

The success of the program depends on the conscious participation and cooperation of all personnel involved in the process, which are usually represented by doctors, nurses, assistants, cleaning personnel, internal and external collectors, and maintenance and services personnel. A management model where there is a follow-up in a participatory way between the generator and those responsible for providing the service is necessary to achieve a good PGRSS and minimize difficulties in the professional context.

Risks of Inappropriate Disposal

The fourth category refers to the risks that incorrect disposal can cause, and it is observed that professionals are aware of the impact of SHW on health and the environment, according to the reports that follow.

"I understand that society has no idea how it is disposed, and the importance of proper disposal." (NT2)

"Some, because they take time to degrade, cause great damage to the environment, and some also become toxic to society." (P1)

"Too bad, because contamination is dangerous and decomposition takes time." (NUR1)

"It affects the environment or even if it is contaminated, it contaminates people." (SW1)

"It will take a long time to decompose, and even long if it's plastic material; in addition to rotting, it makes the soil infertile." (HYG1)

"Inappropriate disposal has major consequences for both man and nature." (LAUND1)

"If they are discarded in common waste, they can be reused by those who find them, and they can pollute the environment." (P2)

Hospital waste is composed of medicines, contaminated syringes, human remains, hygiene material for dressings, contaminated blood, etc. These components bring risks to those who come into contact with them and to the environment[22].

After analyzing the responses of the professionals interviewed in this study, it was observed that all of them indicated in their responses a concern for the environment in view of the risk that incorrect disposal can cause. P1 and SW1 emphasized that if the waste was contaminated it would affect people's health, while LAUND1 and P2 emphasized that incorrect disposal can cause serious damage, both to the environment and human beings.

Based on the veracity of the facts, it can be seen that the disposal of SHW in inappropriate places can cause serious damage to human health, animals and the environment. Data from a study show that the treatment that the water receives is not enough to degrade all the chemical processes of drug metabolites. It is also considered that SHW in the environment can impact human beings through the consumption of animals exposed to environmental contamination or drinking water[23].

Medicines and their metabolites, for example, are poorly biodegradable and very persistent substances, and when they reach treatment plants through domestic sewage, their percentage of removal is small[24].

Categorized as micropollutants, medicines or their metabolites reach the environment in three ways: direct disposal, when the medicine is discarded directly in the garbage, sink, toilet; natural excretion, when medicines are biotransformed before final sanitary disposal through rational use; bodily removal, when topical medication is removed during bathing or personal hygiene. These routes justify the presence of compounds of different pharmacological classes in groundwater, surface water and water for human consumption[25].

The possible ecotoxicological effects of medicines on the environment are poorly understood. Research has correlated medicines or their metabolites present in the aquatic environment with dysfunctions in the endocrine and reproductive systems of animals, such as endocrine changes, incidence of malignant tumors and bacterial resistance[26].

It has already been mentioned that the amount of solid waste generated in health care facilities is a result of the different activities that are carried out there, depending, therefore, on the number of medical services, the degree of complexity of the care provided, the size of the facility, the proportion between outpatients and inpatients, and the number of professionals involved. Thus, it is not easy to establish simple relationships that allow estimating the amount of solid waste generated[27,28]. One of the important factors in the management of Solid Health Services Waste is related to the training of professionals for correct segregation. It must be taken into account that the professionals who work in the process may not have the notions of environmental care in their training. As a rule, their training is specific, technical and does not provide the necessary preparation for the search for conditions that favor the minimization of risks, both those inherent to the execution of their activities and those involving the environment. Waste management is normally delegated to workers with low levels of education who perform most activities without proper guidance or insufficient protection[29].

Thus, adequate education and training must be offered to all workers, ranging from doctors to waste pickers, to ensure they understand the risks, teach how to protect themselves and how to manage waste and, in particular, how to minimize waste and carry out segregation correctly[29,30]. The employee, once admitted or already performing their duties in the hospital environment, must be trained and integrated into the institution's activities, specifically the waste handling system. It is essential to achieve an appropriate integration with co-workers who perform superior functions, subordinate staff, patients, the public, etc. Training and improvement actions must be permanent and supported by the use of posters, bulletins, lectures in appropriate language for everyone who has access to this information[30].

In this context, it is established the need to prove the annual training of employees in the hospital context according to the risks to which they are subjected[4]. Thus, education and continuing education programs must be offered to minimize risks and promote health[30].

The categories listed in the study – Understanding Solid Hospital Waste; Waste Destination; Difficulties and Limitations and Risks of Inappropriate Disposal – showed the importance of continuing education on SHW and the qualification of health professionals during their academic or technical training period. The research also points to the need to provide a greater sample range for the diversification of participants and the reapplication of the study after the complete implementation of PGRSS in the hospital studied to expand the information obtained and design a new perception.

FINAL CONSIDERATIONS

The interviewees' difficulties regarding the knowledge and understanding of the subject were understood based on a momentary overview of the participants' perception. Such difficulties impact on their attitudes and practices, proving the lack of knowledge about the management of solid health-care waste in the hospital context, although they showed knowledge that the incorrect disposal of contaminated waste would affect people's health, and could also cause damage to the environment.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

CONTRIBUTIONS

Both authors contributed to the conception and design of the study; the acquisition, analysis and interpretation of data; and the writing and/or revision of the manuscript and are responsible for its content and integrity.

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