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A STUDY ABOUT THE DISPOSAL OF SOLID WASTE OF HEALTHIN A PUBLIC HOSPITAL INSTITUTION IN SANT'ANA DO LIVRAMENTO TOWN

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ABSTRACT

This article was created with the purpose of improving studies in the field on the disposal of solid waste of health in a public hospital in the municipality of Sant'Ana do Livramento. To obtain the results, a qualitative orientation research was developed, conducting structured interviews with two persons responsible for the sectors that involve hospital waste. The answers of these interviews served as a theoretical basis for analysis and results, and the objectives of this study were achieved, mainly identifying the policy adopted by the hospital institution regarding solid health residues.

Keywords: Solid Wastes From Health, Hospital Waste, Environment, Conscious Disposal.

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1. INTRODUCTION

Currently, the discussion about actions on environmental preservation is increasingly persistent, in the sense that any and every organizational activity should provide clarification to the State on the destination of the waste it produces. However, there is a certain negligence on the part of the professionals who manage these organizations and companies, which in general contribute to pollution and the degradation of the environment. Despite this, we are pleased to understand that the structure of Brazilian legislation is consolidated both for prevention and for maintaining the general order of preservation of the environment.

Although there are different forms of sustainable solid waste management, we have chosen to analyze the processes of generation and disposal of solid waste generated by a Brazilian public hospital. This choice is justified by the fact that the institutions that promote the preventive and curative health of the population have enormous responsibility for the product generated and its destination, since, according to Naime, Ramalho and Naime (2008), environmental impacts caused by inadequate management of hospital waste can have serious consequences for the environment and the population, from contamination to the generation of epidemics and endemics.

The management of RSS is considered a controversial issue and is well discussed, considering the risks and problems that improper handling can cause to the environment and to human health. According to Silva and Rampelotto (2012), the recycling of waste is fundamental for the preservation of the environment: besides reducing the extraction of natural resources, it reduces the consumption of energy, also reducing the accumulation of waste produced. These authors also comment on the growing installation of recycling plants and industries, which give the correct destination to recyclable materials, contributing to environmental protection.

That said, we should also note the work of cooperatives and individual waste pickers who have "scoured" garbage bags in search of recyclable material and can be harmed with sharps and contaminated with chemicals and radioactive materials used in those institutions. Thus, environmental issues related to the management of hospital solid waste have proved extremely important, since they involve not only the environmental issue itself, but also a whole social context.

In Brazil, it is possible to observe several cities that present inadequate practices for the management of hospital solid waste, from segregation to final disposal (FILHO et al., 2010). The National Council of the Environment (*CONAMA*), in its resolution 358/05, which deals with the treatment and final disposal of health services waste and other measures, clearly defines who can produce and the place of production of these types waste:

> Health care waste is generated in all services related to the care of human or animal health, including home care services and fieldwork; analytical laboratories for health products, mortuary, funeral homes; legal medicine services; drugstores and pharmacies; educational institutions and research in the area of health; zoonosis control centers; importers, distributors of diagnostic material products, among others similar (*CONAMA*, 2005).

Thus, we observed that the large production of these wastes and inadequate management are part of a problematic that has deleterious effects on both environmental and population health (SILVA; HOPPE, 2005), thus justifying the choice of the subject addressed in this paper. search. Thus, we think of the following research problem: **Is the solid health waste management method used by the hospital institution under study, minimally adequate to the criteria proposed by the legislation?**

In order to answer this question, we elaborate the following general objective: to identify if there is and what is the policy adopted by the hospital institution regarding the management

of solid health residues, verifying if they correspond minimally to the required by the legislation. As a specific objective, we seek to identify: whether there is an adoption of an RSS destination program; the method of segregation of solid wastes from health at the time they are produced; in what way is the disposal of solid health wastes produced by the institution carried out; what level of information and knowledge of the officials responsible for the collection and disposal of waste with respect to the environmental impact that improper disposal can cause to the environment.

According to Pereira and Pereira (2011), in order to understand the chain of production of waste and its management in a sustainable and safe way, with a view to economic gain and promotion of collective health, it is necessary to adopt logistical management, so as to contemplate the relevant variables. The National Council for the Environment *(CONAMA*), in its resolutions no. 238/01 and 358/05, establishes that for any establishment that produces RSS, an environmental licensing process is required that involves the production of a Management Plan *(PGRSS*), specifying which waste is produced, which is the handling, what type of internal collection, packing, external collection, and other pertinent information to the health establishment.

According to Moura and Meotti (2011), this type of waste is subdivided into five groups, which makes their separation extremely complex for many health professionals responsible for it. In order to ensure the correct disposal, there are standards in Resolution 306/04 of the National Agency of Sanitary Surveillance (*ANVISA*) and No. 358/05 of the National Environmental Council (*CONAMA*), which will serve as the basis for the analysis of the results of this research.

2. THEORETICAL REFERENCE

2.1 SOLID WASTE OF HEALTH

It is therefore necessary to understand how health facilities deal daily with the "garbage" or with the "waste" they produce. It is understood that the answers to these questions should be in the processes carried out by professionals responsible for the sector and workers; however, it is observed that much would contribute if the organizational culture were rooted in these operational techniques and environmental values.

According to Gessner et al. (2013), it is necessary that health professionals face this problem by developing specific skills and abilities already in the undergraduate program. For these authors, this is an essential technical-scientific knowledge for the formation of ethical and responsible professionals, given the breadth of issues that involve the production and management of Solid Waste of Health (RSS). Thus, the formation of the professional is understood as a fundamental part in the process of assimilation and commitment to environmental causes, since this theme requires ethical and moral behaviors structurally strong.

For Vilela-Ribeiro et al. (2012), the RSSs popularly referred to as "hospital waste" are those produced in health facilities, consisting of common waste and infectious or risky waste. These wastes have a degree of danger, and the correct disposal is the minimum to do to mitigate the risks. Coelho (2001) states that solid waste services such as those generated by health care providers are part of all areas related to population care, including veterinary care. According to him, hazardous wastes - such as sharps, contaminated, hazardous chemicals, and others - require specific care, from packaging, transportation, storage, collection, treatment to disposal. This sphere is supported by Law No. 12.305 / 2010, entitled Solid Waste Law, as a mechanism to

promote environmental sustainability in the scope of waste / rejects generated by the production and consumption of people, giving its producers responsibility for the proper disposal of garbage.

In the design of Oliveira (2002), the hospital activity is a large generator of waste. Thus, according to Moura and Viriato (2008), the main objective of solid waste management is to minimize the risks to the health of the internal and external population of the health establishment. These authors also point out that, due to the great diversity of health-related establishments, it is not feasible to establish parameters regarding the production of RSS. For Carramenha (2005), residues from the provision of health services to living beings (human and animal), including all medical activities of prevention, diagnosis, treatment and analysis, aim to prevent possible impacts that may affect the population and the environment.

According to Resolution No. 358 of CONAMA (2005), health care waste is grouped as follows:

GROUP A: residues with the possible presence of biological agents that, due to their characteristics of greater virulence or concentration, may present a risk of infection. This group is divided into A1 (discharges of vaccines from microorganisms, transfusion bags, laboratory waste), A2 (animal waste), A4 (human anatomical parts), A4 (air filters and aspirated gases from contaminated area, residues of adipose tissue), A5 (puncturing materials derived from beings contaminated with prunes);

GROUP B: wastes containing chemicals that may pose a risk to public health or the environment, depending on their flammability, corrosivity, reactivity and toxicity characteristics. In this group are hormone products, antimicrobial products, immunomodulators, pharmaceutical residues and pharmaceuticals of controlled drugs, sanitizing residues, disinfectants, residues containing heavy metals; laboratory reagents, including containers contaminated by them;

GROUP C: All material resulting from human activities containing radionuclides in amounts exceeding the limits of elimination specified in the standards of the National Commission for Nuclear Energy (CNEN), for which reuse is improper or not foreseen. This group includes any materials resulting from clinical, nuclear and radiotherapy laboratories containing radionuclides in excess of the elimination limits;

GROUP D: wastes which do not present a biological, chemical or radiological risk to health or environment, and can be assimilated to household waste. This group includes sanitary paper and diaper, food rest of patient, material used in antisepsis, serum equipment, waste from administrative areas, waste sweeping, gardens, gypsum waste from health care;

GROUP E: Sharpening or scarifying waste, such as: razor blades, needles, scalps, glass ampoules, endodontic files, scalpel blades, lancets; capillary tubes, micropipettes; blades and coverslips, spatulas, and glassware broken in the laboratory.

According to this resolution, solid waste management, from generation to disposal, in order to meet environmental and public health and occupational health requirements, is the responsibility of health service providers. The resolution also points out that there is no loss of joint and several liability of natural and legal persons who, directly or indirectly, cause or can cause environmental degradation, especially the transporters and operators of the treatment and final disposal facilities.

It is necessary, then, that the health facility provides the safe handling of the waste, since this operation involves a potential risk of accident, especially for professionals who act directly in the management stages (CUSSIOL, 2008). It is established by the Brazilian Constitution that public cleaning, collection, transport and disposal of solid waste are the responsibility of the Union, the States and the Federal District, and it is incumbent upon them to legislate on the defense and

protection of health. Despite this, municipalities have the autonomy to create their own laws and are responsible for the collection and purposes of the RSS (BRAZIL, article 24, 1988).

According to Resolutions RDC 306/2004 of ANVISA and 358/2005 of CONAMA, every RSS generator must prepare a Health Services Waste Management Plan (PGRSS) based on the characteristics of the waste generated and the existing classification, establishing the guidelines for RSS management. The PGRSS must be compatible with the local rules regarding the collection, transportation and final disposal of waste generated in the health services, established by the local organs responsible for these stages.

For Monteiro et al. (2001), one of the most important procedures in the handling of this waste is the separation of infectious waste from common waste, since infective waste accounts for only 10% to 15% of total waste and common waste does not require greater care. There are two parameters which, if generally fulfilled, would alleviate the problems of waste disposal: the precautionary principle, related to the general population's caution regarding any type of waste, and the principle of the polluter pays, related to the burden that must be paid by the generator of the waste deposited in undue places (BRAZIL, article 225, 1988).

2.2. SOLID WASTE OF HEALTH AND ITS IMPACT ON THE ENVIRONMENT

It is understood that, in addition to the existing care with the handling and disposal of solid waste health, it is imperative to consider the impact of this disposal on the environment. According to Ferreira (2000), the increasing volume of waste produced in urban and industrial centers has been a major concern for communities, governments, researchers and environmentalists, with solid waste being one of the central themes for those who care about the environment.

In fact, many chemicals and many forms of waste result in harmful substances that pose hazards to our lives and to the nature that surrounds us (UNEP, 2017). In view of this, Silva and Rampelotto (2012) affirm that the issue of hospital solid waste characterizes one of the most complex factors of today and that seeking solutions to this problem, starting from the base of generation of these wastes, is a gesture of citizenship. Thus, it is of paramount importance to minimize pathological risks to human health by appropriately handling large volumes of "hospital waste" that will be dumped into the environment. Correa et al. (2005) emphasize that it is also unquestionable to implement RSS management policies in different health facilities, not only by investing in the organization and systematization of generating sources, but, fundamentally, by awakening a human and collective conscience focused on life itself and environment.

For Tapia (2009), it is necessary to broaden the research on the environmental effects on human health caused by the inadequate management of the waste, in order to determine the appropriate disposal for this type of waste. In the areas of formal education, especially in undergraduate courses in the health area, it is essential to provide debates and reflections on environmental and ecological issues, making future health professionals have a global vision and local behavior (BACKES et al. , 2011). The environmental issue has become a determinant of the health-disease process. Therefore, it is important to consider the dimension of the environment before the actions performed in health services, enabling and promoting strategic actions aimed at (re) thinking about health practices and their consequent implications for environmental sustainability (Moreschi et al. , 2011).

Regarding the Brazilian environmental issue of RSS, Vilela-Ribeiro et al. (2009) point out that two main documents were used as a basic reference for a large part of the national work on the subject, namely: Management of waste from hospitals - WHO (1983) and EPA - Guide for

infections waste management (1986) Environmental Protection Agency. The authors, however, consider this a misconception, a proof of the non-integration between politics and society in environmental issues, since the texts present alternative solutions for developed countries, capital investors for the treatment of waste, characteristics that do not include Brazilian policy on waste treatment.

Vilela-Ribeiro et al. (2009) also highlight the need to know these norms and rules as tools to ensure proper management of RSS:

> Thus, the generation of environmental problems to the detriment of the lack of proper management of RSS makes the man reflect on the importance of knowing what should be done in relation to RSS management. It is therefore interesting to know the laws, norms, decrees and resolutions in force in the country on how institutions that produce RSS must proceed in the collection, selection, storage and disposal of them and therefore a normative revision is made , the main rules of the country's environmental management bodies, in addition to those regulating and licensing health institutions (VILELA-RIBEIRO et al., 2009).

The possibility of contamination of the environment, of patients, of employees and of the community by such residues can be considered non-existent if adequate management and control measures are adequately applied (ERDTMANN, 2004; PEREIRA, LUCENA, FERNANDES, 2010).

3. METHOD

The present article is characterized in the qualitative approach with descriptive and exploratory character. According to Gil (2012), the descriptive research has as main objective the definition of the characteristics of a population, of a phenomenon or the establishment of similarities between variables. As for the character of the exploratory research, Gil (2012) emphasizes that its intention is to approximate the idea or the general view about some factor defined in the research. In dealing with the qualitative approach, the researcher "is not concerned with numerical representativeness, but rather with the deepening of the understanding of a social group, an organization, etc." (GERHART and SILVEIRA, 2009).

The method used in this article was the case study, in order to comprehensively study the impact of hospital waste in the environment. This method "allows the analysis of a situation in which interference can not be made in order to manipulate relevant behavior; in this method the data are collected from multiple sources "(STAKE, 1978; DENZIN; LINCOLN, 2001). In this same bias, Gil (2010) identifies that the case study does not have a rigid structure, but varies according to the researcher's objectives.

In order to gather information, a structured interview was applied, which, according to Severino (2007, p. 125), contains questions that are directed and previously established with a certain internal articulation, approaching a questionnaire, but without the impersonality of the latter. We interviewed the employee, identified by the initials PMG, responsible for the Hospital Infection Control (CCIH), which deals with the environment in the institution under study, and the worker responsible for the collection and storage of hospital waste, identified by the initials OPM. were recorded by a mobile device, and then written and analyzed in detail.

To complement the survey, a documentary research was done to analyze the Health Services Waste Management Plan - PGRSS of the institution. According to Severino (2007: 124), documentary research is every form of recording and systematizing data, placing them in conditions of analysis by the researcher. According to Gil (2012), the document in question consists

of second-hand documents, which are documents that have already been analyzed, such as research reports, company reports, statistical tables, etc. (GIL, 2012, p. 51).

For the data analysis, the content analysis was used. For Bardin (1977), this type of analysis tends to be descriptive when the technique is used in the conversation between individuals, and this data serves as the basis for the production of content studies. This method is defined by Berelson (1952, p. 13) as "an investigative technique which, through an objective, systematic and quantitative description of the manifest content of communications, is intended to interpret the same communications."

4. RESULTS

The results are divided into two topics: the first one interviewed the head of the CCIH sector and the second the worker responsible for collecting and storing the RSS of the Hospital Public Institution.

4.1. THE DISCOUNT OF RSS IN THE HOSPITAL PUBLIC INSTITUTION OF THE MUNICIPALITY OF SANT'ANA DE LA LIBRAMENTO

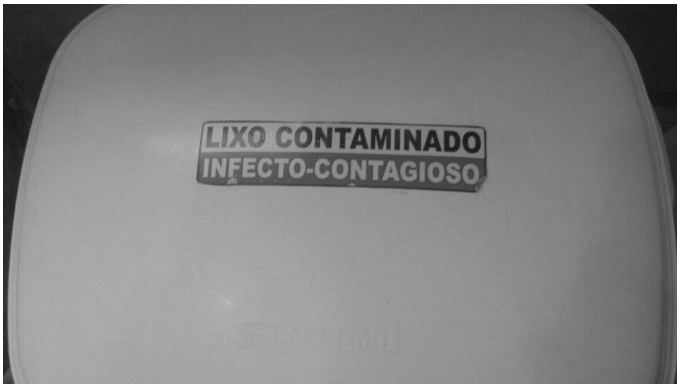
At the Hospital Institution under study, the Health Services Waste management plan (RSS) is stored through online media, and those responsible for each sector have a way stored in an electronic device. According to the official P. M. G., the elaboration of the management plan followed the principles proposed by the manual established by the norms of ANVISA (National Agency of Sanitary Surveillance).

When questioned about the practices for the reduction of RSS, the interviewee points out that there is no practice aimed at reducing waste production, and it is sometimes unavoidable not to use them in procedures, be they surgical or routine, since they are related to care for lives. Likewise, re-use is an unfeasible factor, as infections are often treated and, therefore, one should avoid contagion of close ones. Regarding recycling, the official said that so far, no policy has been implemented in this regard.

In this hospital, several types of waste are produced, which can be identified as: Type A (Infectants), Type B (Chemicals), Type C (Radioactive), Type D (Common) and Type E (Cutting Drill). It is important to point out that none of the types of waste that the institution produces receives some internal pretreatment before its packaging. For good organization, garbage is packaged in different ways so that it can be easily identified by in-house professionals.

Type A (Infectant) is stored in a milky white bag, identified in the image below:

Figure 1 - Waste Type A - infective



Source: Araújo et al. (2017).

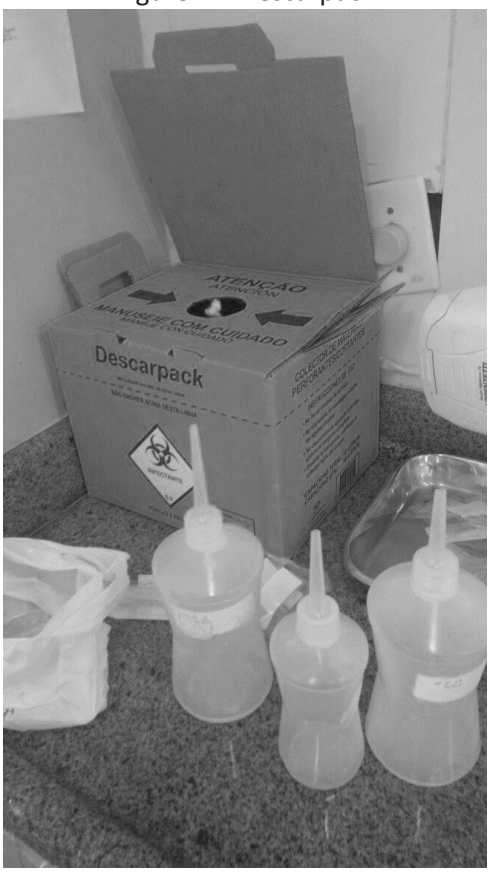
Garbage classified as Type B, in turn, consists of expired drugs. Disinfectant, developer and fixative packagings, among others, are disposed of together with the contaminated waste of Figure 1, but in separate packaging.

The RSS, prior to the collection to the final destination outside the hospital, is stored in an appropriate place for hospital waste, located in the back of the Institution. This place is called the yard, and the waste is stored in containers for the truck of the company responsible to collect. The patio is the exclusive place for this temporary disposal, to which only one person has access: the person in charge of all the collection of the Institution, which keeps the place always organized.

The interviewee, Fr. M. G., stressed the importance of having different containers in the place, which serve to facilitate the identification by the servers of the hospital and the servers of the external company, responsible for the collection. The site is disinfected daily, both by the institution and the site of the RSS storage. The collection is done weekly by a compactor truck, which also collects all the organs that produce hospital waste and RSS in the city of Sant'Ana do Livramento. When questioned about the cost of the service, Fr. M. G. stated that he did not know the information.

The interviewee also mentioned the relevance of the disposal of the sharps rubbings classified as Type E waste, discarded in a box called Descarpack, which can be visualized in the figure below:

Figure 2 – Descarpack



Source: Araújo et al. (2017).

To avoid damages to the environment and to prevent pollution, the interviewee believes that it is necessary to dispose of the solid waste of the investigated institution in an adequate way, aiming at the well being of humanity and the soil. This is because contamination would lead to problems such as: the multiplication of microorganisms in the environment, the use of materials discarded erroneously by people passing through the dumps, the contamination of the soil of the dumps or the places where the waste is disposed of, and the contamination of wells water surrounding the dumps, infecting the drinking water consumed by other residents.

In the hospital environment, P.G. understands that improper storage can increase the chances of bacterial multiplication and infection in patients, as well as contaminate and put at risk the employees who manipulate these materials and the visitors that run through the hospital corridors daily. Thus, it is understood that keeping the hospital environment clean and organized is everyone's duty.

4.2 THE DESTINATION OF SOLID WASTE FROM HEALTH GENERATED BY THE INSTITUTION

To introduce this topic, we initially characterized the types of waste generated by the Hospital Institution, identified by O. P. M. as biological / contaminated (eg cotton, gauzes, gloves of procedures, plasters and bandages, etc.), sharps and common. We identified that approximately 3,202 liters of waste contaminated by the Institution are generated per week. The sharps are separated into descarpack packages, which are characterized by three modes: 03 L, 07 L, and 13 L. There is no information on the amount of common waste produced because, according to the official, it is not heavy, since there is no cost to the hospital; the garbage is only discarded in the common trash and collected by the truck that collects the municipality.

O. P. M. pointed out that all garbage packaging is identified by symbols or by descriptive indicative plates. It was observed that, after leaving the hospital, the garbage is sent to the external area identified as a courtyard, where it is deposited and then taken to the final destination. Below, Figure 3 illustrates the institution's courtyard:

Figure 3- Common garbage stored in the hospital yard

Source: Araújo et al. (2017).

As for the internal collection of the RSS, there is an employee of the Hospital Institution responsible for the collection, which is done weekly. This internal waste is transported in a cart with a lid, preventing odors from spreading through hospital corridors. When asked about the internal treatment of the garbage before arriving at the patio, O. P. M. responds that there is no type of treatment. As for the person responsible for the external collection, the interviewee points out that he is a specialized company, but he does not have specific knowledge about his name, just intuition that it is located in the city of Santa Maria. It was also reported that the head of the institution does not know the type of treatment given to the garbage, only believes that the final destination is its incineration.

In the visit of the place next to O. P., it was witnessed the precarious condition in which is the deposit of RSS of the Hospital Institution, as shown in Figure 4, below:

Figura 4 - Local designado para depósito de resíduos sólidos hospitalares infectantes

Source: Araújo et al. (2017).

It was noted that there is a freezer that stores human waste as well as several badly sealed containers, which cause bad odor in the environment and do not have classification or identification for deposit and separation of waste. This shows that the separated residences at the time of their generation do not remain separated at the time of deposit and destination since they were mixed together. It was also observed that in this same place, there are hospital beds, furniture and utensils that can be reused by the institution. Therefore, there is no correspondence of the minimum safety measure for the storage and storage of utensils that can be reused, since the garbage storage area is very exposed and close to these objects.

Although the garbage is well separated at the time of its generation, when taken to the outside it is treated in another way, which contradicts the answer given by the person in charge of the sector:

> Interviewer: How is the temporary storage of Health Services waste done before it is collected by the person responsible for the external transportation to the final destination?
> PMG: Oh yeah, they're stored in the back, it's ... like a patio, no one has access, and the garbage is put in barrels ... in containers, and what comes out of the surgical block stays in a type-one refrigerator freezer, until they come to remove, and other types of garbage have their proper containers.

5. FINAL CONSIDERATIONS

Based on the information obtained in this study, the results showed the complexity of the topic addressed, indicating the need for greater attention, since hospital wastes packed in inadequate places can pose risks to human health and the environment. It should be taken into account that the proper disposal of these wastes depends completely on all those involved, from the one who generates them to the one who destines them to the proper place; so it is necessary for everyone to be aware of and aware of the harm that RSS can cause.

The interviews showed that the professionals are aware of these risks and act according to the appropriate procedures, selecting the residues and doing the daily disinfection to avoid any contamination. Thus, it was identified the adoption of an RSS destination program, pointing out, however, that employees perform activities in a precarious way and with minimal training.

A method of segregation of solid health wastes was also identified at the time they are produced, realizing that at the time of the waste generation, they are properly separated, but while waiting for the weekly collection, they stay together indiscriminately. In addition, it was verified the way in which the disposal of solid health wastes produced by the institution is carried out, through an outsourced company whose name is unknown by the employees, which causes high costs for the institution.

With regard to personal protective equipment, the institution provides them to employees who perform hospital cleaning and garbage collection in order to minimize accidents due to the great manipulation of sharps and contaminated materials. Thus, issues related to the manipulation and disposal of RSS are not only about workers, but also about those responsible for planning and raising awareness of all those who are part of the institution, in order to guide them to handle waste properly.

As for the analysis of the level of information and knowledge that the officials responsible for the collection and disposal of garbage have regarding the environmental impact that the inappropriate disposal can cause, it was not possible to complete it, considering that the questionnaire proposed was answered only by the two employees pointed out in this study and can not represent the general view of the institution's employees. Therefore, a limitation was noted in this study, since the access to a larger group of employees for the interviews was not possible, not by the management, but by the employees themselves, who apparently felt troubled or , somehow distrustful when receiving the research proposal.

In general, the result of this study is of great value for the institution, since, from this one, it can propose actions of improvement for the maintenance of the place that houses the infected trash, as well as to organize a safe deposit for the furniture and utensils exposed to the elements. Likewise, the study is important for the Social Sciences because it proposes an analysis of the reality of many Brazilian hospitals that, because they do not often have trained professionals, end up developing their activities in an inadequate way, offering risks to their workers, the community and the environment.

REFERENCES

AGÊNCIA NACIONAL DE VIGILÂNCIA SANITÁRIA ANVISA (Brasil). Resolução da Diretoria Colegiada RDC nº 306, de 07 de dezembro de 2004. Dispõe sobre o Regulamento Técnico para o gerenciamentode resíduos de serviços de saúde. Diário Oficial da União, 10 dez. 2004.

BACKES, M. T. S. et al. Do antropocentris

mo ao ecologicentrismo: formação para o cuidado ecológico na saúde. **Rev. Gaúcha Enferm.**2011;32(2):263-9.

BARDIN, L. Análise de conteúdo. LISBOA: Edições 70, 1977.

BERELSON, B. Content Analysis. In: **Communication Research.** New York: University Press, 1952.

BRASIL. Constituição Federal de 1988. Promulgada em 5 de outubro de 1988. Disponível em <http://www.planalto.gov.br/ccivil_03/constituicao/constituição.htm>Acesso em: 20 de jun. de 2017.

BRASIL. Ministério do Meio Ambiente, Conselho Nacional do Meio Ambiente, CONAMA. **Resolução CONAMA nº 238/2001**, de 12 de julho de 2001. Disponível em: < http://www2.mma.gov.br/port/conama/res/res01/res28301.html> Acesso em: 31 de jul. de 2018.

BRASIL. Ministério do Meio Ambiente, Conselho Nacional do Meio Ambiente, CONAMA. **Resolução CONAMA nº 358/2005**, de 29 de abril de 2005. Disponível em: <http://www.mma.gov.br/port/conama/legiabre.cfm?codlegi=462> Acesso em: 31 de jul. de 2018.

CARRAMENHA, M. M. L. **Gerenciamento de resíduos sólidos em serviços de saúde:** uma contribuição para a avaliação do desempenho ambiental. Dissertação (Mestrado em Engenharia Ambiental Urbana)– Escola Politécnica da Universidade Federal da Bahia, Salvador, 2005.

COELHO, H. Manual de gerenciamento de resíduos sólidos de serviços de saúde. Rio de Janeiro: FIOCRUZ, 2001.

CUSSIOL, N. A. de M. **Manual de gerenciamento de resíduos de serviços de saúde.** Belo Horizonte:Fundação Estadual do Meio Ambiente FEAM, 2008.

DENZIN, N. K., LINCONLN, Y. S. **The American tradition in qualitative research.** 2001.

ERDTMANN, B. K. **Gerenciamento dos resíduos de serviço de saúde**: biossegurança e o controle das infecções hospitalares. Revista Texto & contexto Enfermagem, Florianópolis, v.13, p. 86- 93, 2004.

FILHO, A. M. C.et al. Análise do conhecimento de profissionais da saúde, estimativa na cidade de Sítio Novo, TO, Relativo aos resíduos hospitalares. **Educação Ambiental em Ação.**n.31. Ano: VIII Março/ Maio 2010, online.

GESSNER, R.et al. O manejo dos resíduos dos serviços de saúde: um problema a ser enfrentado. **Cogitare Enfermagem**, v. 18, n. 1, 2013.

GIL, A. C. **Métodos e técnicas de pesquisa social.** São Paulo: Atlas, 6ª Edição, 2010.

MONTEIRO, J.H.P. et al. **Manual de Gerenciamento Integrado de resíduos sólidos.** Coordenação técnica Victor ZularZveibil. Rio de Janeiro: IBAM, 2001.

MORESCHI, C. et al. Homenagem a Florence Nightingale e compromisso com a sustentabilidade ambiental. **Rev BaianaEnferm.**2011;25(2):203-8.

MOURA, A. de; VIRIATO, A. **Gestão Hospitalar.** São Paulo: Manole, 2008.

MOURA, G. M. S. S. de; MEOTTI, K. Resíduos sólidos de serviços de saúde: uma fotografia do comprometimento da equipe de enfermagem. **Revista gaúcha de enfermagem.** Porto Alegre. Vol. 32, n. 2 (jun. 2011), p. 338-344, 2011.

NAIME, R.; RAMALHO, A. H. P.; NAIME, I. S. Avaliação do sistema de gestão dos resíduos sólidos doHospital de Clínicas de Porto Alegre. **Revista Espaço para a Saúde**, Londrina, v.9, n.1, p.1-17, dez.2008.

OLIVEIRA, J. M. de. **Análise do Gerenciamento de Resíduos de Serviços de Saúde nos Hospitais dePorto Alegre.** Dissertação (Mestrado em Administração)– Universidade Federal do Rio Grande do Sul, Porto Alegre, 2002.

PEREIRA, A. L.; PEREIRA, S. R. A cadeia de logística reversa de resíduos de serviços de saúde dos hospitais públicos de Minas Gerais: análise a partir dos conceitos da nova Política Nacional de Resíduos Sólidos Urbanos. **Desenvolvimento e Meio Ambiente**, v. 24, 2011.

PEREIRA, S.S.; LUCENA, L. L.; FERNANDES, A. Resíduos de serviço de saúde em um hospital de Campina Grande/PB: gestão e percepção ambiental. **Revista Brasileira de Gestão e Desenvolvimento Regional**, v.6, n.3, p. 255-286, set.-dez./2010.

SEVERINO, A. J. **Metodologia do trabalho científico.** São Paulo: Cortez, 23ª Edição, 2007.

SILVA, C. E., HOPPE, A. E. Diagnóstico dos resíduos de serviços de saúde no interior do Rio Grande do Sul. **Artigo técnico apresentado a Revista de Engenharia Sanitária e Ambiental**, v. 10, p. 146-151, 2005.

SILVA, N. M. da; RAMPELOTTO, E. M.. Segregação dos Resíduos Sólidos Hospitalares. **Revista Monografias ambientais.** v.5, n. 5, p. 1174-1183, 2012.

STAKE, R. E. The case study method in social inquiry. **Educational researcher**, v. 7, n. 2, p.5-8, 1978. Disponível em: <http://journals.sagepub.com/doi/abs/10.3102/0013189X007002005?journalCode=edra>. Acesso em: 31 de jul. de 2018.

TAPIA, C. E. V. Diabetes mellitus e o descarte de seringas e agulhas. **Rev. Gaúcha Enferm.** 2009;30(2):228-34.

VILELA-RIBEIRO, E. B. et al. Uma abordagem normativa dos resíduos sólidos de saúde e a questão ambiental. **REMEA - Revista Eletrônica do Mestrado em Educação Ambiental**, v. 22, 2009.