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Management proposal for waste services health - case study at the Federal Institute of Pernambuco, Recife, Brazil

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Abstract
Health Service Residues (RSS) are generated by human or animal health care services, containing a high potential for contamination and degradation, and can generate, with their inadequate management and disposal, serious environmental impacts. In Brazil, about 43% of solid waste is disposed of in dumps, which may result in soil, water, and air contamination. The handling and disposal of RSS offer physical-chemical and biological risks, especially to the professionals involved in its handling, as well as the collectors in the dumps. This work had as main objective, to propose the Management for Residues of Health Services in an ambulatory located in the Federal Institute of Pernambuco (IFPE), where a diagnosis of the current management in the ambulatory was carried out based on documentary, bibliographic and field data. The characterization and quantification of waste showed that most of the RSS generated in the Outpatient Clinic are subject to recycling.

Keywords: management. waste. biosafety. sustainability

1. Introduction

Modern society faces serious challenges, among them, the complexity of environmental problems. There are several possible sources of environmental degradation, however, the waste produced by health services has an important peculiarity due to its toxic or pathogenic characteristics, since, when improperly managed, they also pose a risk to public health [1].

Health Service Waste (RSS) is generated by medical, dental, laboratory, pharmaceutical and healthcare teaching and research institutions related to both the human and veterinary populations. Medical assistance services are one of the major generators of hazardous waste, with practices that endanger the environment, despite being essential to human development. These represent a small portion in relation to the total waste generated in a community, RSS are potential sources of contamination to the environment and present an additional risk to health professionals and the community in general, when improperly managed [2].

The handling of RSS offers risks especially of cutting and contamination with biological materials. Regarding the environment, the main risks are related to the inadequate final disposal that can result in contamination of the soil, water (superficial and underground) and air. Considering that, in Brazil, a large part of urban waste is destined to controlled dumps and landfills, there is still a risk of exposure of collectors to this waste. In cases where RSS is sent for incineration, there is also a risk of contamination of the air with dioxins and furans, highly carcinogenic substances, if the appropriate environmental control systems are not adopted [3].

A study presented by the Brazilian Association of Public Cleaning and Special Waste Companies [4], showed that, of the almost 70 million tons of solid urban waste collected in Brazil annually, 42% still go to controlled dumps and landfills, considered environmentally inadequate. According to this survey, and considering the goals set out in the National Solid Waste Policy and Plan, the country needs to invest R$ 11.6 billion by 2031 in the infrastructure to universalize the proper destination of solid waste.

In this way, environmental responsibility grows as a broad and relatively recent research topic in the health field. Bearing in mind that the increase in life expectancy implies a greater need for health services and that these, in turn, generate environmental consequences with negative effects on the sector, a deeper understanding of the relationship between environmental responsibility and the health sector is necessary. health [5].

It is the responsibility of health professionals, therefore, to guide and maintain the aseptic chain, to comply with biosafety rules and the disposal of waste generated in the exercise of the profession, based on laws, resolutions and technical standards that regulate their activities aiming at their protection and the environment, since they are at constant risk of acquiring diseases in the exercise of their functions.

Higher Education Institutions - HEIs (according to [6]) are accredited as Colleges, University Centers and Universities, being responsible for the production and socialization of knowledge and training of human resources, having the important role of setting an example; to produce; socialize and train professionals respecting the environment. The adoption of an environmental policy with the solution of environmental conflicts in educational institutions resulting

from activities (teaching, research and extension), depends on behavioral changes in this community and integration of different areas of knowledge, with the support and approval of discharge direction, essential for success [7].

HEIs need to set an example for their undergraduates, given that each professional / undergraduate will carry out their practical activities with knowledge and responsibility regarding the risks arising from the inappropriate disposal of RSS. And as these institutions will form future managers and health professionals in the academic field, it is necessary to enhance the involvement and participation of the entire university community in the construction and implementation of policies for the proper management of their waste, so that they can contribute effectively and committed to environmental sustainability. Continuing education should also be part of the strategies to encourage knowledge about the correct management of waste generated in these health service environments, but it is necessary to reevaluate how this material could be included as content to be explored in graduate courses, as well as periodicals, newsletters and newspapers, among others, assisting in the information of the professional, since they are themes inherent to the profession, that is, they all produce waste, in different forms and quantities [8].

In this context, the Ambulatory of the Federal Institute of Education, Science and Technology of Pernambuco (IFPE), is directly related to these behavioral changes, as it is inserted in a Teaching Institution, with regard to the production, consumption and disposal of its products. waste generated, since it deals with activities that require a series of materials and resources for its operation.

Thus, the proposal of Health Services Waste Management, in the medical and dental care units, becomes a necessary and effective tool, in an attempt to mitigate the effects caused to the environment by inadequate waste disposal, which have a high contaminating potential, since management comprises actions related to decision making in administrative, operational, financial, social and environmental aspects and has integrated planning as an important instrument in waste management in all its stages - generation, segregation, packaging, transportation, until the final disposal, allowing the establishment of a systematic and integrated way, in each of them, goals, programs, organizational systems and technologies, compatible with the local reality.

This research had as main objective the proposal of Waste Management of Health Services for the Medical-Dental Clinic of the Federal Institute of Education, Science and Technology of Pernambuco (IFPE), Campus-Recife, in order to promote consumption and sustainable practices in its activities, through the adoption of measures aimed at sustainability, with the promotion of management stages of the waste generated in order to minimize the risks of contamination of the community and the environment, as well as to enable the improvement of safety and hygiene measures in the job.

2. Materials and Methods

2.1. Study Area

The IFPE, Campus Recife, totals an area of 130,000 m², located in the City of Recife. Pernambuco, Brazil. The Institute consists of 8 blocks, where classrooms and administrative departments, Ambulatory, operate, in addition to common living areas.

Currently, IFPE has 2,350 employees and 5,200 students enrolled for the second semester of 2019, which can be attended at the institution's outpatient clinic, which is divided into 14 environments, which are the reception, pantry, infirmary, rest room / dressing, coordination, 3 medical offices, 2 dental offices, sterilization room, purge, storage for cleaning supplies and bathroom (Figure 1).

***Source*:** Google Earth (2020).

Fig 1: Location of the IFPE, Recife, Pernambuco, Brazil.

2.2. Data collect

The methodology used was through the case study at the Ambulatory of the IFPE, Campus Recife, having as main objective, the Health Services Waste Management proposal for the same.

The first step consisted of a systematic analysis of the theoretical framework in order to obtain current articles, to obtain secondary data, based on the study by reading these articles, seeking information that was relevant to the topic, especially regarding legislation, in which the Management proposal for the Clinic was based, based on resolutions and laws of ANVISA (National Health Surveillance Agency), CONAMA (National Environment Council), scientific sites and bibliographies of the area in the last five years, in order to carry out the survey of secondary documentary data (laws, decrees, reports) and bibliographic (articles, theses, dissertations).

The second stage was performed through the search of primary data, with data collection performed during 2019, at the Institution's Outpatient Clinic, in order to know the waste generated and its monthly amount, through direct interviews with the auxiliaries. in oral health, nursing and the general services worker, responsible for collection, to better understand the outpatient routine regarding biosafety and the stages of waste management (questions regarding disposal times, type of packaging and RSS collections, as well as questions about the routine of cleaning the offices). The quantification of the RSS was performed daily with the help of the general services employee, for weighing the waste.

2.3. Quantification of health service waste

To obtain the total amount of waste generated in 24 hours, it was necessary to carry out the weighing procedure at different times. The RSS was separated and weighed by duly selected, oriented, and supervised employees (Figure 2).

All results were recorded in specific spreadsheets, allowing to know the characterization and the amount of waste generated daily. Thus, it was possible to obtain the total in

kg of waste classified in groups A and D, group D waste was sub-grouped into non-recyclable and common waste recyclable.

Weighing infectious waste and dry matter, including recyclable waste (metal, glass, paper, plastic, styrofoam), was carried out before their disposal in the shelter external. A scale was used for this. The weighing of common wet waste (food leftovers) was carried out before the final disposition.

All residues were identified before leaving the generating unit. For this, adhesive tape was used where the sanitation employee wrote the name of the unit generating.

Fig 2: Weighing of waste. Source: The Authors (2020).

3. Results & Discussion

With planning, the adequacy of management procedures, the signaling system and the use of appropriate equipment, it is not only possible to reduce risks, but also to reduce the quantities of waste to be treated and, also, to promote the reuse of a large part of the segregation of a good part of the recyclable materials, reducing the costs of its treatment and final disposal. For this purpose, a flowchart of the waste management of the study under study was elaborated (Figure 3). [9], stated that there is a need for a broad understanding of all issues involving RSS, within the scope of social responsibility, in view of the actions inherent to segregation in the workplace, in the manipulation, management and final destination of employees.

***Source*:** The Authors (2020).

Fig 3: Flowchart of Outpatient RSS Management.

3.1 Diagnosis of the Ambulatory's Current Situation

It covers the study of the establishments situation in relation to RSS, whose analysis identifies the conditions of the establishment, the critical areas, providing necessary data for the implementation of management, through the survey of the types of waste and quantities generated, based on the classification defined by the ANVISA. The following steps were developed based on the Health Services Waste Management Manual / Ministry of Health, National Health Surveillance Agency [10]:

3.1.1 Activities developed at the Outpatient Clinic

The professional staff is formed by four Dental Surgeons, five Doctors, three Nurses, four Nursing Technicians (IFPE servers) and two Oral Health Assistants, one General Services Assistant and a Receptionist.

The service is performed daily, except Saturdays, Sundays, and holidays, in the morning, afternoon and night shifts, from 7:00 am to 9:00 pm. during the study period, 839 appointments were made, considering that a Dentist was licensed, and a Doctor was on vacation.

The Ambulatory in its routine, performs three types of Activities, such as:

-Nursing procedures, performed according to the daily demand, in order of arrival: Measurement of vital signs, administration of medications, dressings, cryotherapy, hebiatric consultation, monitoring of patients in emergency situations, vaccination, prevention campaigns and promotion of Cheers.

- Outpatient medical procedures, performed according to the daily demand, in order of arrival, for medical appointments, or pre-scheduled for medical examinations: Consultation, sick leave, medical examination, admission examination.

- Dental procedures and dental expertise, performed through pre-scheduled dental appointments: Consultation, clinical examination, intraoral radiographic examinations, preventive, restorative, endodontic, surgical (minor oral surgeries) and periodontal procedures.

The activities carried out by these professionals generate waste, which is an important part of solid urban waste, requiring correct management, especially because of the potential risk they present to the ecosystem.

3.1.2 Outpatient Hygiene and Cleaning Processes

- Daily general cleaning before starting patient care.
- After collecting the waste, cleaning, and disinfecting the collection containers is performed.
- Disinfection of surfaces after each service.
- 70% alcohol on the chair and surfaces.
- Instrumental: standard sterilization process, using an autoclave.
- Water quality, carried out in the practical discipline of Microbiology, in the Chemistry Laboratory of the Institution.
- Water from the public network.
- Cleaning of the water tank done by a third-party company.
- Sewer: public network.
-Water for dental equipment: Bottles of mineral water.
- Biological control of autoclaves used to sterilize instruments.
- Cleaning of air conditioning filter.

3.1.3 The Steps of Handling Outpatient RSS

3.1.3.1 Identification

It consists of a set of measures that allows the recognition of waste contained in bags and containers, providing information to guide planning, the definition of procedures and equipment for the correct management of health waste

(RSS). [11] classifies RSS according to different risk groups that require specific forms of management. In the Outpatient Clinic, the classification of groups according to risk, associated with the waste generated in it, is described in:

Group A - biological waste: with the possible presence of biological agents that, due to their characteristics, may present a risk of infection: teeth, roots, gingival flaps and tissues; cotton and gauze with bodily waste; mask, glove, cap, sucker, and disposable materials that contain blood, mucus, or body fluids; dressings, surgical points, dental floss, sanding strips, matrix strip, tongue depressors, among others that had direct contact with some patient's secretion;

Group B - chemical waste: tubes of anesthetics, antibiotics and expired drugs; reagents and catalysts; mercury, capsules and residues from unused amalgams or removed fillings; glutaraldehyde and alcohols; phosphoric acid, and developer, fixative and radiographic films used in dental radiology.

Group C - radioactive waste: they are not part of the Ambulatory waste.

Group D- common waste: most of the waste generated in the clinic is classified in this group, since it is all waste that does not contain a risk of infection, nor chemical waste, nor sharps (in the offices and infirmary), food scraps and the preparation of food (in the pantry), waste from administrative areas and waste from the bathroom;

Group E - sharps: needles, drills, endodontic files, diamond tips, explorers, scalpel blades, lancets, spatulas and all broken glass utensils in the offices and dressing room.

At the Clinic:

- The identification symbols were observed only on the milky white bags for packaging group A waste and in the rigid boxes for group E waste, while [11] stated that the RSS identification must be affixed to the collection cars, in the storage places and in the bags that hold the waste;
- Collecting containers and waste storage locations are not properly identified, as [11] has determined that internal and external collection containers, as well as storage locations where RSS is placed, must be identified in a location easy to see, indelibly using symbols, colors and phrases, in addition to other requirements related to the identification of content and the specific risks of each waste group;
- The purge and the cleaning material room are used as a temporary shelter but do not have identification on the door, as according to [11], the utility room or purge can be shared for the temporary storage of Groups A, E RSS. and D and must be compatible with the area to be occupied by the collectors in use and be identified as "TEMPORARY SHELTER OF WASTE".

3.1.3.2 Segregation

Segregation is one of the fundamental operations to enable the objectives of an efficient waste handling system to be met and consists of separating or selecting waste appropriately according to the classification adopted, taking into account minimization, with waste reduction (common, hazardous or generation), looking for ways to fight waste, that is, generate the minimum. This procedure applies to all materials used: packaging, disposable materials, food scraps and leftovers, chemicals, among others.

A good management of health service waste must have segregation at source as a principle, which results in a reduction in the volume of waste with potential risk and in the incidence of occupational accidents.

At the Clinic:

- Professionals should be trained to properly identify and segregate waste according to its classification, while [12] in their research "Environmental sustainability: dental waste management in the public service" observed that, of the total of professionals surveyed, 97.3% say they know what health waste is and that it can harm health and the environment; however 41.1% had little knowledge about the PGRSS, despite 88.2% knowing about its mandatory nature;
- The number of containers is compatible with the number of environments and according to the types of waste generated.
- The waste is stored close to the place of its generation.
- The recycling of common waste (Group D) is not carried out, despite the distinct segregation, in the environments where the collectors for health waste (biological, group A) and common waste for recycling are found.

In the Table 1, the types of waste generated can be seen, according to their generation locations, noting that common waste (Group D) is generated in all environments of the Clinic:

Table 1: Place of Generation / Types of waste generated at the IFPE outpatient clinic.

	Group A	**Group B**	**Group D**	**Group E**
Dental Office 1				
Dental Office 2				
Dressing Room				
Purge (Temporary waste shelter)				
Room - Doctors 1				
Nursery				
Sterilization				
Cup				
Cleaning material deposit				
Room - Doctors 2				
Room - Doctors 3				
Coordination				
Bathroom				
Reception				

***Source*:** The Authors (2020).

3.1.3.3 Packaging

It consists of packing segregated waste, in bags or containers. The capacity of the packaging containers must be compatible with the daily generation of each type of waste.

According to [13] in the handling of waste from health services:

- The employee must use personal protective equipment (PPE) when storing the waste in the containers.
- Every container must be closed so as not to allow leakage.
- Every container must be closed when 2/3 of its capacity is filled.

The Ambulatory has 14 different environments, observing that:

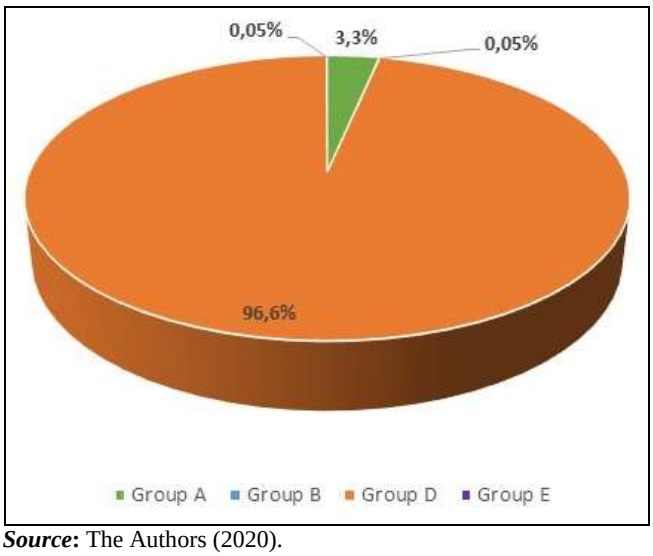
- For the disposal of biological waste (group A), the two dental offices, a doctor's office, the purge room (temporary shelter) and the dressing room, have containers with a lid and pedal, provided with milky white bags with identification of waste with biological risk, in accordance with the research by [14], where the majority of Dental Surgeons (67%), stated that they correctly disposed of contaminated solid waste by storing it in resistant plastic bags and milky white color with identification symbol.
- The used developer and fixer (Group B liquid waste), are

packed in their original packaging, without a symbol and a risk phrase, while [11] stated that liquid RSS should be packed in containers made of material compatible with the stored liquid, resistant, rigid and watertight, with a lid that guarantees the containment of the RSS and identification;
- Lead sheets from radiographic films (solid waste from group B) are discarded along with waste from group A, while [11] stated that packaging containers for chemical RSS (Group B) in solid state must be constituted of rigid, resistant material, compatible with the characteristics of the conditioned and identified chemical product; kept in the purge closet (must be sent for external collection);
- The amalgam used in the dental office today is in small quantity and is contained in capsules, which are discarded in the rigid cardboard box. According to [15], regarding amalgam disposal, that 43.2% of Dental Surgeons did not use amalgam and, of those who did, 29.7% separated it in an unbreakable container and sent it for recycling; 13.5% sent the amalgam remnants together with the garbage that would be incinerated and 9.4% discarded amalgam in the ordinary garbage;
- In all environments there are containers with a lid and pedal, provided with a black bag, for the disposal of common waste (Group D), except for the cleaning material tank, according to [11], which recommends that the bag collector for The packaging of the RSS must be made of smooth, washable material, resistant to puncture, rupture, leakage and tipping, with a lid provided with an opening system without manual contact, with rounded corners; The DRC also mentions that the bags that hold Group D's RSS do not need to be identified;
- The packaging of sharps (Group E) is carried out in rigid cardboard boxes with an identification symbol.

3.1.3.4 Quantification

Figure 4 shows the predominant gravimetric percentage in the studied period. Group D was predominant, with about 96.6% of the waste generated, followed by Group A, with 3.3%. This demonstrates that most of the waste generated is organic material or material that can be recycled and does not present any type of risk. Class A waste (3.3%) presents biological risks. [16], when carrying out studies in several clinics, found a higher percentage of infectious residues, reaching a range of 50%.

The per capita generation of total waste allowed for this study was approximately 0.94 kg x inhabitant / day. For Class D waste, the generation per capita was 0.9 kg x inhabitant / day, and Class A waste only 0.03 kg x inhabitant / day, or that will not be undervalued or due to excessive care regarding its management.



***Source*:** The Authors (2020).

Fig 4: Graph of quantification of waste generated at the Clinic.

3.1.3.5 Internal Collection and Transport

The collection and internal transport of the RSS consist of the transfer of waste from the generation points to a place destined for temporary storage or external storage, with the purpose of making it available for collection. It is at this stage that the process becomes visible to the user and the public, as the waste is transported in the collection equipment (collection cars) in common areas.

At the Clinic:
- The collection of biological waste, group A (milky white bag), is carried out daily, at the end of the morning, according to [11], which further determines that the bags for packaging RSS of group A must be replaced when reach the limit of 2/3 (two thirds) of their capacity or every 48 (forty-eight) hours, regardless of the volume, aiming at the environmental comfort and safety of users and professionals; bags containing RSS of group A of easy putrefaction must be replaced at most every 24 (twenty four) hours, regardless of the volume.
- Group B residues, effluents from the processing of development (developer and fixer), are collected when they reach 2/3 of the total container capacity.
- The collection of common waste, group D (black bag), is carried out daily, in the late morning and late afternoon.
- Group E waste is collected when it reaches half the total capacity of the rigid box, whereas according to [11], it must be replaced according to demand or when the filling level reaches 3/4 (three quarters) capacity or according to the manufacturer's instructions, and manual emptying and reuse are prohibited.
- Regarding the use of PPE, the responsible general services employee wears a uniform, boots and gloves for common waste, adding the use of a mask to collect biological waste (group A), while [13] recommends that during handling and

collection internal I of the infectious waste, the individual must wear the following PPE: hat, glasses, mask, uniform, gloves and boots; When handling common waste, do not use a hat, glasses and mask.
- The shape of the bags closure is made by twisting and knotting up to the limit of 2/3 of the total volume capacity of the bags and according to [13], the plastic bag has to be closed, twisting and tying its opening with wire, string or knot; When closing the bag, excess air must be removed, taking care not to inhale or expose yourself to the air flow produced; After closing, the container must be immediately removed from the generating unit and, through internal collection I, taken to the waste room.
- The Ambulatory does not have a collection car for its residues, and its internal transport is done manually and according to [13], the transport of the containers must be carried out without excessive effort or risk of accident for the employee and for manual displacement, the containers containing residues (sealed containers) must not exceed 20 L of capacity. When transporting a container containing waste (sealed container) above 20 L, the internal collection trolley 1 must be used.
Note: Due to the amount of waste generated at the Clinic during data collection (the largest weighing was that of common waste, which during the whole month of August was 45.50 kg), it is observed that there is no obligation to use the car of collection in relation to weight, since the daily collection would be well below 20 L. However, as the internal transport of the containers must be carried out without excessive effort or risk of accident for the employee, it will be necessary to purchase two collection cars; one for group A, E and B residues, and another for group D residues.

3.1.3.6 Temporary Storage
It consists of temporarily guarding the containers containing the waste already stored, in a place close to the generation points, aiming to speed up the collection within the establishment and optimize the movement between the generating points and the point destined for availability for external collection. It is observed that in the Outpatient Clinic, temporary storage:
- Group B waste (developer and fixer resulting from the process of developing radiographic films) is carried out in the purge room (temporary shelter), until it reaches 2/3 of the total packaging capacity, being transported directly to external storage.
- The room is close to the place of its generation, including a communication window between the dental office 2 and the purge.
- From Group D waste (common waste), it is made in the deposit for cleaning material.
- As there is no collection car in the deposit for cleaning material, the bags with common waste (Group D), from the different environments of the Clinic that are collected (in the late morning and late afternoon), are placed in a single bag, with a capacity of 200 liters, on the floor of the tank for cleaning material. The [13] establishes that in the temporary and external storage of RSS it is mandatory to keep the bags packed inside collectors with the lid closed.
- Sharps (Group E) from dentistry, are stored in the rigid cardboard box, directly on the floor of the purge; while the other box for sharps (Group E), is on the shelf in the dressing room table; Both are transported directly to external storage when they reach up to 3/4 of their total capacity.
- Of group E waste, it is done in the purge room, because, according to [11], the utility or purge room can be shared for the temporary storage of RSS of Groups A, E and D, and must be compatible with the area to be occupied by the collectors in use and be identified as "TEMPORARY WASTE SHELTER".

3.1.3.7 External Storage
It consists of the packaging of residues in shelter, in suitable collection containers, in an exclusive environment and with easy access for collecting vehicles, awaiting the completion of the external collection stage. It must have the following characteristics: Accessibility, security, exclusivity, hygiene, and sanitation.
At the IFPE Ambulatory:
- The external shelter is reduced for the storage of waste from groups A and E, according to the amount generated, in accordance with [13], which specifies that the generating establishment, whose weekly production does not exceed 700L and whose daily production does not exceeds 150 L must: be enclosed; be exclusive for temporary custody of health service waste, properly packaged; having sufficient dimensions to store production for up to three days, without stacking the containers above 1.20 m, having a floor, walls, door and ceiling made of smooth, waterproof, washable and white material; two openings of 10 cm x 20 cm each, located one 20 cm from the floor and another 20 cm from the ceiling, opening to the external area.
- It is located next to the Clinic, with its door always locked with a padlock, having easy access for external waste collection.
- The external storage of RSS is used only for the health waste of group A and group E, because, according to [17], temporary storage, internal transport and external storage of this waste (sharps), can be made in the same containers used for Group A.
- Group B waste is transported directly from the temporary shelter to external collection.
- It is exclusive for the temporary custody of the RSS, which are properly packed in the milky white bag, inside the 50-liter container, which is delivered every week by the contracted company, which collects the RSS.
- It has no identification [13], determines that the reduced shelter must have a door bearing the symbol of "infecting substance".
-The common waste, group D (which represents most of the waste from the clinic), is transported directly to the external storage location of the institution's total waste.

3.1.3.8 Collection and External Transport
External collection consists of removing the RSS from the waste shelter (external storage) to the treatment unit or final disposal, using techniques that guarantee the preservation of the packaging conditions and the integrity of the workers, the population and the environment.
At the Clinic:
- The collection and external transport of the RSS of groups A, B and E are carried out by the contracted company, weekly, on Fridays, responsible for their treatment and environmentally appropriate disposition.
- The collection and external transportation of group D

waste is carried out by the same company hired to collect all waste generated by the Institution, responsible for its environmentally appropriate disposal.
- The person responsible for the external collection of the RSS must strictly observe the use of the appropriate PPE, as according to [18], the PPE of the garrison of the external collection: Uniform, Gloves, Boots, Vest, Cap.

3.1.3.9 Destination (Treatment and Adequate Final Disposal)

At the Outpatient Clinic, no treatment or final disposal is carried out, since all waste generated has environmentally adequate collection, transportation and disposal carried out by a third-party company, and it is up to them to carry out these management steps, according to the rules, referring to each type of waste, the Ambulatory must be attentive:
- Contract expirations with the service provider and collection of documents referring to the license to provide the service and certification of the destination of the waste.
- Regarding common waste, group D, which can be recycled so that they receive all the care to avoid mixing with the waste, encouraging the recycling industry and integrating the collectors of these materials in actions involving shared responsibility for the life cycle of the products.

Treatment consists of applying a method, technique or process that changes the characteristics of the risks inherent in the waste, reducing or eliminating the risk of contamination, occupational accidents, or damage to the environment. It can be done in the generating establishment or in another location, in these cases, observing the security conditions for transportation between the generating establishment and the treatment site.

Adequate Final Disposal consists of the final disposal of waste on the ground or in places previously prepared to receive it. Under Brazilian law, the provision must comply with technical construction and operation criteria, for which environmental licensing is required.

[15] in the article "Environmental behavior linked to dental activities", stated that, regarding the disposal of the packaging of the radiographic film and lead sheets, 55.4% of the Dental Surgeons destined the packaging in the contaminated waste that would be incinerated, and 4.0% sent the lead for recycling; Among the interviewees, 82.4% stated that they release the revealing and fixing material directly into the sewer network; meanwhile [14], stated that the disposal of revealing fluids and fixing of X-ray films is not carried out correctly by most Dental Surgeons, since that 46% discarded liquids in the sink of the offices and only 28% the company collects.

Given this, it is easy to agree with the article by [19], where they stated that the management of solid health residues only to comply with the legislation in force in the operational scope does not solve the problem in all its magnitude. For the problem to be solved in a broad way, there must be involvement and awareness of the entire organization as well as the entire population involved.

3.2 Occupational Safety / Continuing Education

The service must ensure that workers are periodically evaluated, following specific legislation, in relation to occupational health, keeping records of this assessment, and must describe the training to be carried out, in the initial and continuing education forms, in order to guide, motivate, raise awareness and permanently inform all involved about the risks and appropriate handling procedures, in accordance with the precepts of waste management, even those that act temporarily. Continuing Education should address topics such as:
- RSS management: segregation practice; symbols, expressions, color patterns; location of storage environments and shelters; life cycle of materials; environmental regulations, public cleaning and sanitary surveillance; definitions, type, risk classification in the management of RSS; ways to reduce the generation and reuse of materials; responsibilities and tasks; use of collectors; use of Individual (EPI) and Collective Protection (EPC): biosafety; guidance on personal hygiene and environments; special guidelines and training in radiological protection when there are radioactive waste; measures to be taken in case of accidents and emergency situations; basic view of solid waste management in the municipality or Federal District; basic notions of infection control and chemical contamination; and knowledge of assessment and control instruments.

4.3 Risk Control

Every activity presents risks to the physical integrity of those who perform it. The activities that are carried out in health facilities do not escape this rule. The risks are divided into biological, chemical, ergonomic, physical and accidents.

The identification of risks in each location (unit or service) of the establishment is not a simple task, but it is the first stage of risk management. Once a risk has been identified, it is taken to minimize it.

As for control measures: more than one measure is usually proposed, to "surround the risk"; these measures have some "lines of conduct" for collective protection; work organization; individual protection; training (always fundamental); preventive maintenance of equipment.

Protective equipment - Protective equipment is all devices designed to protect the health and physical integrity of the worker and must be used by employees who handle waste, in accordance with the normative recommendations of the Ministry of Labor.

4.4 Insect and Rodent Control

About pest control, to prevent the proliferation of insects and rats on the premises of the clinic, it is carried out through a contract with a third-party company to carry out the established pest control.

4.5. Emergency and Accident Situations

Safe work practices require the development of procedures for reviewing procedures in the activities carried out by professionals who deal directly with waste, to reduce the likelihood of accidents at work.

It should be considered that most of the exposure to biological materials is related to the care of sharps, the prevention of environmental contamination and the subsequent exposure of bloodborne pathogens.

Immediate Action Plan in case of accidents with sharps:
- Keep calm, wash the wound thoroughly with soap and water and immediately go to the Reference Center to deal with occupational accidents with biological material from your region. At that location, the fact must be

communicated to the Occupational Safety Technician, the notification inquiry has been completed and the Work Accident Communication - CAT has been issued. Ideally, the victim and the condition of the accident should be evaluated by a multi-professional team.

At the Outpatient Clinic, the nursing sector must contact the family to transport the patient according to what is established. The patient must be referred and accompanied to the Hospital das Clínicas or to a Reference Service.

4.6 Execution and Evaluation Indicators

It specifies what is to be evaluated, what are the proposed and measurable changes, considering the objective of greater number of services with less amount of waste generated.

In the Outpatient Clinic, the indicators are directly related to the amount of variation in the generation of waste in each group, which can be obtained by purchasing a scale to weigh the waste, to assess the variation in the indicators in relation to the amount of waste generated., as well as compliance with the Environmental Standards and Legislation in force, reported and a Technical Responsible designated for this function.

4. Conclusions

Based on the studies presented, it is observed that health waste, as it contains a high degree of contamination and degradation, requires adequate management to reduce environmental and public health impacts.

Given this, it is noted the importance of the correct RSS Management for the IFPE Outpatient Clinic, in the sense that the inadequacies found in its activities during data collection, can be corrected, promoting sustainable consumption and practices in the Institution.

The proposal for the Outpatient's RSS Management was developed with the adoption of measures aimed at sustainability, through the correct management of its waste (reducing the consumption of materials, water, energy, processes and services), thus minimizing the use of natural resources, pollution and amount of waste generated and discarded.

The characterization and quantification of residues indicate that most of the RSS generated in the Outpatient Clinic is Group D (common) and can be sent for recycling.

The Institution must also promote training in the initial and continuing education forms, addressing topics related to the management of RSS, biosafety, emergency situations, among others.

Therefore, the IFPE Campus Recife Ambulatory needs the implementation of a Health Waste Management Plan (PGRSS), to exercise its correct management and to comply with the legislation in force.

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