ORIGINAL ARTICLE

SOLID WASTE MANAGEMENT IN PRIMARY HEALTH CARE*
GERENCIAMENTO DE RESÍDUOS SÓLIDOS NA ATENÇÃO PRIMÁRIA À SAÚDE
GESTIÓN DE RESIDUOS SÓLIDOS EN ATENCIÓN PRIMARIA DE SALUD

Joice Teles da Silva¹ , Talita Hevilyn Ramos da Cruz Almeida¹ , Myria Ribeiro da Silva³ , Alana do Nascimento Azevedo⁴ , Sonia Maria Isabel Lopes Ferreira⁵ , Gisleide Lima Silva⁶ , Nayara Mary Andrade Teles Monteiro⁷

ABSTRACT

Objective: to analyze the management of solid waste from Primary Health Care. **Method:** this is a qualitative, descriptive, exploratory, observational study. Nine of the ten Family Health Units of Primary Health Care were observed. Non-participant observation was used as a data collection technique through a script. For data treatment and analysis, descriptive analysis was used. **Results:** it was pointed out that the solid waste management in the PHC of the municipality in question is not in accordance with the Brazilian legislation. **Conclusion:** it is essential that there are permanent education actions on waste management in order to enable nurses and their staff to be instrumental in effectively designing and implementing the PGRSS. **Descriptors:** Solid Waste; Nursing; Primary Health Care; Health and Environment; Infection; Disease Control.

RESUMO

Objetivo: analisar o gerenciamento dos resíduos sólidos da Atenção Primária à Saúde. **Método:** trata-se de um estudo qualitativo, descritivo, exploratório, observacional. Observaram-se nove das dez Unidades Saúde da Família da Atenção Primária à Saúde. Utilizou-se, como técnica de coleta de dados, a observação não participante por meio de um roteiro. Empregou-se, para tratamento e análise dos dados, a análise descritiva. **Resultados:** apontou-se que o gerenciamento dos resíduos sólidos na APS do município em questão não está em conformidade com a legislação brasileira. **Conclusão:** torna-se imprescindível que haja ações de educação permanente sobre o gerenciamento dos resíduos com o intuito de que os enfermeiros e sua equipe sejam instrumentalizados a elaborar e implementar, com eficiência, o PGRSS. **Descritores:** Resíduos Sólidos; Enfermagem; Atenção Primária à Saúde; Saúde e Meio Ambiente; Infecção; Controle de Doença.

RESUMEN

Objetivo: analizar el manejo de residuos sólidos de la Atención Primaria de Salud. **Método:** estudio cualitativo, descriptivo, exploratorio, observacional. Se observaron nueve de las diez Unidades de Salud Familiar de Atención Primaria de Salud. Se utilizó como técnica de recolección de datos a través de un guión. Para el tratamiento y análisis de datos, se utilizó un análisis descriptivo. **Resultados:** se señaló que la gestión de residuos sólidos en la APS del municipio en cuestión no se ajusta a la legislación brasileña. **Conclusión:** es esencial que existan acciones educativas permanentes sobre gestión de residuos para que los enfermeros y su personal puedan desempeñar un papel decisivo en el diseño y la implementación eficaces de los PGRSS. **Descriptor:** Residuos Sólidos; Enfermería; Atención Primaria a la Salud; Salud y Medio Ambiente; Infección; Control de Enfermedad.

^{1,2,3,5,6,7} Santa Cruz State University / UESC, Ilhéus (BA), Brazil. ¹ <https://orcid.org/0000-0001-7950-8293> ² <https://orcid.org/0000-0001-9775-0788>
³ <https://orcid.org/0000-0003-2600-6577> ⁵ <https://orcid.org/0000-0002-3502-3398>; ⁶ <https://orcid.org/0000-0002-8057-2249> ⁷ <https://orcid.org/0000-0003-0160-962X> ⁴ Base Hospital in Itabuna-Bahia. Itabuna (BA), Brazil. ⁴ <https://orcid.org/0000-0001-7701-285X>

*Article extracted from Course Completion Work << Solid waste management in primary health care in a municipality in southern Bahia >>. 2018.

How to cite this article

Silva JT, Almeida THRC, Silva MR, Azevedo NA, Ferreira SMIL, Silva GL, *et al.* Solid waste management in primary health care. J Nurs UFPE on line. 2019;13:e241518 DOI: <https://doi.org/10.5205/1981-8963.2019.241518>

INTRODUCTION

One of the biggest concerns worldwide about solid waste is known to be its accumulation. They are generated by human actions and, since the Industrial Revolution, they are produced on a large scale and, according to the National Solid Waste Policy (NSWP), these wastes are substances, materials, objects or something that is discarded as a result of human activities, their final destination will be in solid or semi-solid state and they cannot be directly discharged into sewers, requiring adequate technical solutions.¹

It is understood that in Brazil, waste accumulation, lack of processing and inadequate treatment are a serious public health problem. Solid Waste in Health, are also called hospital waste, however, can be originated in various environments such as clinics and Primary Health Care (PHC). Therefore, it is essential to have proper management planning to reduce contamination and thus reduce the risks to the population's health and environmental contamination.²⁻⁴

In health services such as PHC, due to their demands and services, various types of waste are generated and their management is of fundamental importance, being done with the involvement of health teams and users so that there is a process of transformation in relation to environmental education and public policies focused on sustainability. Thus, the management of these wastes is supported by the 1988 Constitution, reaffirmed by the Organic Health Law.⁵⁻⁶

According to the 2006 National Health Surveillance Agency (ANVISA) Manual on Collegiate Board Resolution (CBR) 306/2004, for the effectiveness of this management, there are relevant points ranging from the segregation made where it was produced until the proper disposal of these wastes for optimal treatment. Thus, it is clarified by the integrated waste management, that priority should be given to non-generation, minimization of generation and reuse of waste, to avoid negative effects on the environment and public health.²

This management should occur through various management procedures planned and implemented with theoretical and legal basis, as this facilitates management, encouraging less waste generation, referral to a safe place, protection of society, the workers themselves and the environment.²

For this to happen, it is recommended that each health service should develop its Health Care Waste Management Plan (HCWMP). This document presents the actions that are related to solid waste management, observing the characteristics and risks in the domain of the

establishment of the entire Health Care Waste Management (HCWM) process, as well as protection actions to public health and the environment.^{2,7}

They were also brought as a framework for waste management by the PNRS established by Law 12.305 / 2010, as a basis, integrated management and sustainability, and seek to promote environmental protection and improving the condition of the population's life, adapting, in the best way, the whole process of waste production until its final treatment, also valuing the preventive methods. Thus, one of its principles is the guarantee of access to information by the population and the possibility of participating in the processes of formulation, implementation and evaluation of public policies related to solid waste.¹

It is noteworthy that NSWP also states that these wastes must be disposed of in an environmentally sound manner, and that some types of waste may be reused, recycled, composted and recovered when possible, or may be disposed of by the competent authorities. Final disposal should also be in place that is appropriate to specific operating standards to avoid damage or risk to public health and safety and to minimize adverse environmental impacts.¹

In view of the above, we sought to find an answer to the following research problem: "Does the municipal PHC solid waste management process comply with Brazilian law?"

OBJECTIVE

- To analyze solid waste management in Primary Health Care.

METHOD

It is a qualitative, descriptive, exploratory, observational study. The descriptive study disrupted everything that occurs in the field of study, thus identifying, from the observational technique, its characteristics. The research was conducted in a municipality located in southern Bahia, Brazil. The study subjects were composed of the ten Basic Health Units of the city, however, the research was conducted in nine Units, because during the data collection period, a health unit was closed for retirement.

Inclusion criteria were Family Health Strategy Teams in full exercise in the community, generating solid waste in health. And as exclusion criteria, Teams that were not in exercise and that did not sign the free and informed consent form of the research.

Non-participant direct observation of the waste management process was carried out using a field observation script based on DRC 306/2004⁷. This roadmap is divided into two steps: The first one

referred to the classification of waste and groups from which it was identified which types of waste were generated in each unit. The second step referred to the description of solid waste management in these units, from segregation, packaging, storage, internal and external transportation, to the final destination.

Data was collected between June and August 2017. Data from field observation were used as objects of a descriptive analysis.

The study was approved by the Research Ethics Committee of the Santa Cruz State University, opinion nº 2.062.691 / 2017. Participants were informed about the purpose of the study, the confidentiality and the possibility of interruption of their participation without any prejudice. After the participants' acceptance, the Free and Informed Consent Form was signed.

RESULTS

The sample consisted of nine Primary Health Care Basic Units, which correspond to 90% coverage of the municipal territory in which they are inserted, since only one unit did not participate in the study because it was closed for retirement.

Based on the observation script, residues of different classes present in the units were identified, according to DRC 306/2004.⁷ Group A (potentially infectious and vaccine), B (chemical) residues were found in all units, including cleaning and medication products, D (common residues) and E (sharps).

It was observed that there is no segregation and packaging of waste, according to its class, as well as identification of the same in the studied Health Units. It was also found that expired medications are most often discarded along with the infective waste in the pellets to be incinerated.

Furthermore, through the observation script prepared by the authors and based on the DRC, the stages of solid waste management in the Health Units were analyzed. It is noteworthy that the observed steps include until the temporary storage phase (intra-urban management).

Regarding the segregation of waste, it was found that it occurs in the unit itself, however, this step is only performed with the biohazard, sharp and common hazard classes, which were being neglected respectively in a black plastic bag where the identified milky white bag and the sharp and piercing materials in specific boxes established by the DRC should be used; the common waste was being discarded in a black plastic bag.

We highlight the use of biosafety standards in the segregation of these wastes. This study was limited by the fact that some workers are not in the unit at the moment or because they segregate

at times incompatible with observation. However, it has been found that many general service professionals do not use all biosecurity standards, ie they do not always use the necessary equipment and do not handle waste properly. It was observed, in only one health unit, that instead of the appropriate glove, the professional wore a procedure glove and had no boots.

It was found from the observation and analysis of the field of study that the waste is not packed in specific plastic bags of resistant and impermeable material, since they have only the sharps boxes and black plastic bags without any identification.

However, it was noticed in all units that the containers with the plastic bags, as well as the collection boxes of sharps, have the limit of filling respected, that is, up to 2/3 of their capacity, being prohibited its emptying or reuse. It is reported that only one unit had an overflow box, but this was used as a disposal of expired disposable syringes that were not used. In one unit (11%), in the dentist's office, there was a container with the residues exceeding the recommended filling limit.

It was observed, with regard to packaging containers, that they are resistant to punctures, ruptures, leaks, were washable and have lid with pedal-operated opening system. In five units, open containers without pedal were identified, mainly used for common waste.

Thus, common waste is stored in open containers without a pedal with a black plastic bag, while infectious and sharps are discarded in specific rigid boxes, as well as in the procedure rooms, which only have black plastic bag for the packaging of waste and rigid boxes of sharps, making it difficult to correctly handle infectious waste. In addition, with regard to internal transport, it was not possible to identify how it was carried out, due to the same difficulties encountered in observing biosecurity standards in the segregation of this waste, but in one unit (11%), it was found that the transport of the plastic and sharps bags is done manually, without an appropriate container.

It was found in the units that the infective residue and sharps are stored in a bombona identified with the infective symbol, containing a locking lid, while the common waste is stored in a black bag in another storage space, except in one unit. (11%), which stores it in an unidentified container. Furthermore, it was found that only two (22%) establishments have a specific space to store the infective garbage with washable floors, only one has ceramic on the wall and the other has no ceramic or washable paint. In other units, the bombona is in contact with the space to store cleaning products, sinks, among other materials, and the two units mentioned above are the only

ones in which the professionals of the outsourced company that collect the infective waste do not need to go inside the facility to move these containers.

All containers for infectious waste are stored within the units, but common waste is exposed outside the unit except unit nine, which has an identified common waste location next to the storage of infectious waste. In short, it was observed that the common waste is stored separately from the infecting waste; In addition, regarding the cleaning of the space after collection, it was not possible to observe it because it occurs every 15 or 30 days or because some nurses do not have control / schedule of when this waste will be collected. Collect common waste daily on the outside of the unit, except one containing appropriate space.

Regarding the final disposal of waste in health facilities, common waste such as paper, plastic packaging, cardboard boxes, which are collected daily by the municipal collection, and these waste have, as final disposal, an inappropriate environmental location, popularly called the dump, which is on a highway near the city.

Waste is collected, such as infectious, sharps and expired medications, by an outsourced company, being taken to incineration in a neighboring municipality, and only one (11%) of the establishments send the infective waste to the city, because they do not have the collection of waste. outsourced company, and another unit (11%) that sends overdue medications to the same location for disposal by the municipal pharmaceutical.

DISCUSSION

In all units surveyed, the formation of residues of classes A, B, D and E was detected. Accordingly, a similar study was carried out in the Ceará Family Health Units, which also produce residues of these residues of these same groups.⁸ It is noticeable that in both surveys, no radioactive residues were identified, which correspond to group C, since if they existed, they should have a more specific management, according to DRC 306/2004. Both studies point to a specific profile of waste generated in Primary Care Units. This profile results from the types of services performed in these places, which are standardized according to the National Policy of Primary Care.⁷

It becomes the segregation of waste, when it is generated, of great relevance to the health of professionals involved in care and the community, since it allows the collection and treatment differentiated according to their class⁵. It was identified in this study that there is no segregation of chemical waste. Moreover, it was found that there was no identification of the collection bags, as well as the allocated rigid compartments, also

called garbage dumps. In research conducted in the basic health units of the city of São Paulo, there were irregularities in the segregation of waste related to the lack of identified containers for the waste in their particular group.

Literature, as well as the current norms, point out the importance that proper segregation of waste has, evidencing the reduction of costs and also the risks of infections for the people of the communities and the health workers themselves. Furthermore, it is possible for these wastes to be disposed of safely and the common wastes to be recyclable by separate collection⁵.

According to DRC 306/2004, group A should be identified by its infectious substance-specific symbol in ABNT NBR-7500, having white background labels with black outline and outline.⁷ Almost 100% were presented by Aparecida de Goiânia's public health services in 2017, in compliance with all the rules established in the country described above¹¹. It was noted that for the disposal of Group D waste in 97.37% of the establishments, black bags are used for packaging and only one establishment (2.63%) used white bags for the disposal of this waste. Due to nonconformities such as this, errors in the collection and disposal of waste can be caused, especially when the infectious waste is stored in black bags, with a risk to human health, animals and the environment¹¹.

In research conducted in Juazeiro do Norte, Ceará, in 2007, it was found that no primary health care unit had PGRSS. However, it was found that most units adequately pack sharps⁸. However, it is cautioned that potentially infectious waste is not properly packaged in any of them, as it is packed in sharps containers or in black bags for group D waste, as is also the case in this study.⁸

In Aparecida de Goiânia, some studies were conducted on the highlighted theme, finding that a small percentage (18.47%) of the establishments discarded the waste in a cardboard box, which did not occur in the units of this study. It was also found that in 34.20% of the establishments, the containers did not have activation of the lid opening by pedal or did not have lids, but in this study, it was found that most of the waste for common waste, mainly from reception and bathrooms, was without covers and pedal.¹¹

From the analysis of the literature, it was noticed that it is common in health care units to find technical irregularities in the containers used to allocate infective waste, devices with inadequate color and material bags and maximum residue limits being exceeded.⁸ It is revealed that the identification in the collecting bags was little identified. In view of this situation, the risk of management failures is raised, as professionals may confuse black plastic bags containing infectious waste with those of common waste and,

as a result, improper final disposal may occur in the location popularly called dumping ground.⁸

It is important, even if there is no regulation in force in Brazil that requires the identification of common waste, this initiative because it allows the implementation of selective collection programs, because many social and environmental impacts are avoided.⁵ It was found in research conducted in 3 Basic Units of Pelotas, Rio Grande do Sul, that 57.8% of professionals who attend there reported not knowing the legislation on solid waste, 89.5% perform segregation, but 73.7% reported not knowing their classification and 36.8% were unaware of the specific care for each waste group¹².

In this research, we found faults in the internal transport of waste, and not having the necessary biosafety precautions, because the transport routes are not planned and only one unit can use a multifunctional cart.

Something similar was found in Aparecida de Goiânia, where internal collection is done on demand or once a day. It is noticed that this collection is performed manually and, in two health units visited (5.26%), the employees did not use the PPE necessary to perform the task. According to the technical norms, the collection should be performed on a scheduled basis, in a proper storage place and at a pre-established time, and both the Aparecida de Goiânia units and the ones in this study presented nonconformities in this regard.^{11,12}

In the city of Juazeiro do Norte, Ceará, it was found that, in most of the researched units, the internal transport of the waste did not use specific closed containers as recommended by the legislation and, in this study, no unit had this container.⁸

There must be an internal waste storage facility for their own, and health care facilities should have washable walled, sinks and washable drained or drained floors. Studies conducted in Pelotas, southern Brazil, demonstrated that the internal storage location of the Basic Units was shared with other utilities and none of them had the recommended structure.¹²

It was found in this research, conducted in southern Bahia, compared to the study conducted in southern Brazil described above, that most of the units observed, also did not agree with the DRC. It is noteworthy that the lack of knowledge, as well as the lack of implementation of PGRSS is a national problem, therefore the theme should be widespread in the scientific community.¹²

It is warned that this is the same in health units in the city of Olinda, where there was a failure in the infrastructure, as they do not have a place to shelter these wastes, as well as the lack of a gate for the collection of waste companies responsible

for external collection services. Unfortunately, the literature points out that in many units there are no specific storage locations. Due to the lack of this specific environment, as well as the lack of knowledge of the legislation, ANVISA norms and management technique, professionals are taken to store the waste in environments where other types of activities are performed and, often, the waste is disposed of in the unit outdoor patio environment.^{8,12,13,14,15}

Once collected at its internal storage site, waste is collected for its treatment and final destination. In most health care units, this process is performed by outsourced collection and treatment companies. The municipal health services waste studied by a company that weighs and incinerates, except for group D, is collected and taken to the municipal landfill. This process is of great epidemiological and environmental health importance. Since the inadequate final destination of waste, as well as the failure or lack of treatment, can lead to contamination of the environment from the ground, groundwater, to air and impact on the health of animals, individuals and communities.^{11,15}

CONCLUSION

Given the above, it appears that the management of solid waste in the PHC of the municipality in question is not in accordance with the provisions of Brazilian law. It was found that they do not follow a HCWMP so that their management is done correctly.

It is necessary to emphasize that the whole process is carefully observed, because the HCWM demands a lot of attention and responsibility, in order to avoid social and environmental impacts, always looking for solutions that can be offered for the service.

Finally, it is imperative that there are permanent education actions on waste management with the intention that professionals are instrumental to efficiently design and implement the HCWMP, seeking to include sustainability.

During the study, some difficulties arose, such as the observation of waste management from times that were consistent with the management by general service professionals, since the collection of the municipality (common waste) and of the outsourced company (infectious waste) is irregular, the latter being due to the lack of control of the collection time and the fortnightly or monthly occurrence.

REFERENCES

1. Lei nº 12.305, de 2 de agosto de 2010 (BR). Institui a Política Nacional de Resíduos Sólidos; altera a Lei no 9.605, de 12 de fevereiro de 1998;e

dá outras providências. Diário oficial da União [Internet]. 2010 Aug 02 [cited 2010 Aug 02]. <http://www2.mma.gov.br/port/conama/legiabre.cfm?codlegi=636>

2. Ministério da Saúde (BR), Agência Nacional de Vigilância Sanitária. Manual de gerenciamento de resíduos de serviços de saúde [Internet]. Brasília: Ministério da Saúde; 2006 [cited 2018 Aug 10]. Available from: http://portal.anvisa.gov.br/resultado-de-busca?p_p_id=101&p_p_lifecycle=0&p_p_state=maximized&p_p_mode=view&p_p_col_id=column-1&p_p_col_count=1&_101_struts_action=%2Fasset_publisher%2Fview_content&_101_assetEntryId=271316&_101_type=document.

3. Oliveira EF, Formiga LMF, Lima LHO, Brito BB, Feitosa RC. Solid waste management in health basic units of Picos-PI. *Enferm Foco*. 2014;5(1/2):29-32. Available from: <http://revista.cofen.gov.br/index.php/enfermagem/article/viewFile/601/271>.

4. Oliveira LL, Souza PM, Clementino FS, Paiva SC, Rocha FDLJ. Healthservice waste: challenges and prospects in primary care. *Rev enferm UERJ* [Internet]. 2014 [cited 2019 Mar 15];22(1):29-34. Available from: <http://www.facenf.uerj.br/v22n1/v22n1a05.pdf>

5. Moreira AMM, Günther WMR. Solid waste management in primary healthcare centers: application of a facilitation tool. *Rev Latino-Am Enfermagem*. 2016;24:e2768. DOI: [10.1590/1518-8345.0646.2768](https://doi.org/10.1590/1518-8345.0646.2768)

6. Ministério da Saúde (BR), Secretaria de Atenção à Saúde, Departamento de Atenção Básica. Política Nacional de Atenção Básica [Internet]. Brasília: Ministério da Saúde;2012 [cited 2018 Aug 10]. Available from: <http://189.28.128.100/dab/docs/publicacoes/geral/pnab.pdf>

7. Ministério da Saúde (BR), Agência Nacional de Vigilância Sanitária. Resolução RDC nº 306, de 07 de dezembro de 2004. Dispõe sobre o regulamento técnico para o gerenciamento de resíduos de serviços de saúde [Internet]. Brasília: Ministério da Saúde;2004 [cited 2018 Aug 10]. Available from: http://bvsms.saude.gov.br/bvs/saudelegis/anvisa/2004/res0306_07_12_2004.html

8. Almeida VCF, Pinto SL, Nascimento AJR, Feitosa CR, Alencar PRP. Solid waste management in family health units. *Rev RENE* [Internet]. 2009 Apr/June [cited 2018 Sept 10];10(2):103-12. Available from: <http://periodicos.ufc.br/rene/article/view/4781>

9. Ministério do Planejamento, Orçamento e Gestão (BR), Instituto Brasileiro de Geografia e Estatística, Brasil, Bahia, Camacan. Panorama [Internet]. Rio de Janeiro: IBGE;2017 [cited 2018 Sept 20]. Available from:

<http://cidades.ibge.gov.br/xtras/perfil.php?lang=&codmun=290560&search=bahia>

10. Ascari RM, Bortolini SM, Kessler M, Kanal A, Schwaab G. Análise do gerenciamento dos resíduos na Atenção Básica. *Rev Contexto Saúde*. 2012 July/Dec 12(23):75-80. Available from: <https://www.revistas.unijui.edu.br/index.php/contextoesaude/article/view/1841/2542>

11. Carmo CB, Pasqualetto A, Machado RL. O waste management in the basic health service of aparecida de goiânia/go abstract. *Rev Engenharia Ambiental* [Internet]. 2017 Jan/June [cited 2018 Dec 15];14(1):114-27. Available from: <http://ferramentas.unipinhal.edu.br/engenhariaambiental/viewarticle.php?id=1443>

12. Teixeira MV, Echevarría-Guanilo ME, Knuth FG, Ceolin T. Assessment of the Waste Management in Basic Health Units From a South Brazilian City. *J res fundam care online*. 2018;10(3):824-831. DOI: <http://dx.doi.org/10.9789/2175-5361.2018.v10i3.824-831>.

13. Wafula ST, Musiime J, Oporia F. Health care waste management among health workers and associated factors in primary health care facilities in Kampala City, Uganda: a cross-sectional study. *BMC Public Health*. 2018;19(1):203. DOI: <https://doi.org/10.1186/s12889-019-6528-4>

14. Santos MA, Souza AO. Knowledge of nurses of the Family Health Strategy on health services waste. *Rev Bras Enferm*. 2012 July/Aug;65(4):645-52. DOI: <http://dx.doi.org/10.1590/S0034-71672012000400014>

15. Matos MCB, Oliveira LB, Queiroz AAFLN, Sousa AFL, Valle ARMC, Andrade D, et al. Nursing professionals' knowledge regarding the management of waste produced in primary health care. *Rev Bras Enferm*. 2018;71(6):2728-34. DOI: <http://dx.doi.org/10.1590/0034-7167-2018-0308>

Corresponding author

Myria Ribeiro da Silva
Email: myriarib@uol.com.br

Submission: 2019/06/14

Accepted: 2019/08/23

Copyright© 2019 Journal of Nursing UFPE on line/JNOUL.

This is an Open Access article distributed under the terms of the [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/). This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. Recommended for maximum dissemination and use of licensed materials.