

Perception of clinical analysis laboratory technicians on waste management in this sector in São Tomé and Príncipe

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Abstract

Clinical analysis laboratories generate waste that poses risks to health and the environment, so specific care is required in packaging, transport, storage, collection, treatment and disposal. The objective of the work was to know the perception of clinical analysis laboratory technicians on the management of waste produced in clinical analysis laboratories in São Tomé and Príncipe. For this, an interview survey was carried out with technicians from all clinical analysis laboratories in the country, between March 8 and April 27, 2022. 5 laboratory state that there are no waste management problems. For 2 laboratories the main problem is related to the accumulation of waste around the laboratory. On the other hand, for 8 laboratories, the solution to improve waste management would be for each laboratory to have its own incinerator. It was concluded that, according to the perception of most technicians from clinical analysis laboratories, the best solution for waste management would be through incineration.

Keywords: Waste Management, Sustainability, waste from health services.

Resumo

Os laboratórios de análises clínicas geram resíduos que apresentam riscos para a saúde e o meio ambiente por isso requerem cuidados específicos de acondicionamento, transporte, armazenamento, recolha, tratamento e eliminação. O objetivo do trabalho foi saber qual a perceção dos técnicos de laboratório de análises clínicas sobre a gestão dos resíduos produzidos nos laboratórios de análises clínicas em São Tomé e Príncipe. Para isso foi feito um inquérito por entrevista aos técnicos de todos os laboratórios de análises clínicas do país, entre 8 de março e 27 de abril 2022. Constatamos que 5 laboratórios afirmam que não existem problemas de gestão. Para 2 laboratórios o principal problema de gestão dos resíduos está relacionado com a acumulação de lixo ao redor do laboratório. Por outro lado, para 8 laboratórios a solução para melhorar a gestão dos resíduos seria que cada laboratório tivesse a sua própria incineradora. Concluiu-se que, de com a perceção da maioria dos técnicos de laboratórios de Análises Clínicas, a melhor solução para a gestão dos resíduos seria através de incineração dos mesmos.

Palavras-Chaves: Resíduos, Gestão, Sustentabilidade, resíduos de serviços de saúde.

INTRODUCTION

Clinical analysis laboratories generate residues that present biological risks due to the possible presence of biological agents; physical risks, as a result of disposal of sharp objects; and, chemical risks due to the chemical characteristics and specific degrees of hazardousness to humans and the environment (Cotrim *et al.*, 2012; Mota *et al.*, 2004). Therefore, these residues require specific care in the management process (Coelho, 2002).

Waste management is defined as the set of operations associated with the production, collection, storage, control, transfer and transport, processing, treatment and final destination of waste, in accordance with the best principles of public health preservation, resource conservation, aesthetics and other environmental principles (Cruz *et al.*, 2017). However, Marinho *et al.* (2011) emphasizes that waste management is not restricted to the adoption of practices aimed at minimizing and treating waste produced in laboratory activities, but also the awareness and training of the human factor, since it is not enough just to have routes of waste disposal and treatment if people are not an active and integral part of the waste management.

In this first phase of the doctoral work it is intended to know if the technicians are integrated and know how the waste management process is being carried out, so that, at a later stage, it is possible to identify, according to the perception of the technicians and in collaboration with the authorities and other interested parties, the best solutions for the management of clinical analysis waste for the island state of São Tomé and Príncipe.

Therefore, the **objective** of the work is to know the perception of laboratory technicians on waste management in clinical analysis laboratories. This topic is particularly relevant since there is no other study to date on the perception of professionals working in this area on the management of this type of waste in the country.

METHODOLOGY

The data collection strategy was a survey by interview. Firstly, the heads of each laboratory were invited to respond to the interview. In the impossibility of participating in the interviews, they indicated the technicians of the respective laboratories. All clinical analysis laboratories in the country that are fully operational in 2022 were selected. Therefore, 13 human clinical analysis laboratories and 1 veterinary clinical analysis laboratory were included in this study. An interview guide was prepared following the recommendations of Carmo & Ferreira (2008). No pre-testing of the interviews took place. The interview contained 23 questions, of which 2 questions were selected to this work. Selected questions were related to the perception about waste management in this sector. Each interview lasted approximately 20 minutes. All but one interviews were conducted in person (one was carried out by telephone) and took place between March 8 and April 27, 2022.

RESULTS

According to the results presented in Table 1, it is possible to observe that 5 laboratories stated that there are no problems related to waste management, since in these laboratories the waste is separated. It is known that solid waste management is a process that begins with the proper disposal of waste, going through collection, transport, treatment (including sorting) and disposal (Coelho, 2002) in order to reduce possible impacts on the environment.

Table 1: Perception of technicians about the main waste management problems in the Laboratories

Question	Answer	Number of answers
What are the main waste management problems in this laboratory?	There is no waste management problem in the laboratory	
	<i>"In the laboratory, the waste is separated".</i>	5
	<i>"The management problem is outside the laboratory, that is, at the final destination because we don't know if the waste will be burned or not".</i>	1
	There is a waste management problem in the laboratory	
	<i>"Accumulated waste waiting for collection attracts animals like flies and dogs, and the dogs tear the garbage bags. When collection takes too long, stored waste starts to smell. Collection should take place every day."</i>	2
	<i>"Lack of autoclave and own incinerator".</i>	3
	<i>"Waste with different composition goes to the same place".</i>	1
	<i>"Burning in a hole in the ground is not the most suitable because there are materials that do not burn completely".</i>	2
	<i>"Lack of adequate waste container for disposal, adapted waste container or waste container with pedal".</i>	1
	<i>"Difficulty in acquiring suitable plastics [containers]".</i>	1

Regarding those who said that there are waste management problems, 3 laboratories reported the lack of an autoclave and their own incinerator, 2 state burning waste in a hole in the ground not being adequate since not all materials are completely burned, while 2 state problems related to the accumulation of waste in the laboratory area prior to collection.

Suggestions to improve solid waste management in clinical analysis laboratories in São Tomé and Príncipe are presented in table 2.

Suggestions include the acquisition of adequate buckets and plastic containers for the proper separation of waste (2 answers), the acquisition of autoclave to treat waste (2 answers), having a closed space to better storage the waste prior to collection (2 answers) thus preventing the interference from insects and other animals, more collection vehicles for waste transport (1 answer). For a better final destination of the waste the respondents emphasize that each laboratory should acquire its own incinerator (10 answers). Finally, 1 technician stated that it is not up to him to give an opinion on improvements for the management of waste produced in this sector since it is the state who should propose improvements.

Table 2: Solutions to improve waste management in Laboratories

Question	Answers	Number of Technicians who responded
What can be	<i>"Each lab should have its own incinerator."</i>	8

done to improve waste problems in the laboratory?	“Each district should have its own incinerator to monitor the process and not depend on the only existing incinerator in the country because the person responsible for the incinerator lets the waste accumulate and, on the other hand, the incinerator is not able to incinerate all types of waste”.	1
	“Acquisition of a more environmentally friendly model incinerator with a filter so as not to complicate the ozone layer”.	1
	“Uncontaminated waste should have another destination, such as burning in an internal incinerator to make compost.”	1
	“Recycling of materials such as paper”.	1
	“Acquisition of an autoclave”.	2
	“Purchase of collection vehicles to transport waste”	1
	“Acquisition of suitable buckets with pedal and different color and training of professionals”	1
	“Purchasing plastic [containers] in sufficient quantities”	1
	“Having a hole to burn the garbage”.	1
	“Improving the disposal of waste from the laboratory, if you have to store all the waste there is not enough space and it smells and attracts flies and dogs. Put the waste in a place where there are no dogs or flies”.	2
“It is not up to the laboratory to give an idea, it is up to the state to solve this problem”.	1	

CONCLUSION

For some laboratory technicians solid waste management in laboratories comprises solely the separation of the waste within the laboratory.

The lack adequate containers for waste separation, of closed spaces for storing laboratory waste prior to collection and of final disposal solutions, such as incineration facilities were the main problems identified by technicians of clinical analysis laboratories in São Tomé and Príncipe.

According to the perception of most technicians of Clinical Analysis laboratories, the best solution for waste management would be that each laboratory had its own incinerator.

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