Disposal of Pharmaceuticals and Pharmaceutical Waste: A Regulatory and Technological Approach

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ABSTRACT

The improper disposal of pharmaceuticals and the incorrect handling and disposal of pharmaceutical waste can pose serious risks to public health and the environment. The present study aims to conduct and describe a systematic review, developed through bibliographic research and documentary analysis of laws, regulations, and standards related to the management of medications and pharmaceutical waste. Its objective was to collect information on the procedures adopted for the disposal of pharmaceuticals at the domestic and industrial levels, along with an analysis of the current legislation. The results indicate a lack of information for the general population regarding the correct disposal methods and suggest the issuance of more specific regulations for the treatment and handling of pharmaceutical industry waste. The development of the present study made it possible to conclude that more effective laws and adequate oversight are necessary to reduce the negative environmental impact caused by pharmaceuticals. Moreover, the present study emphasizes the need for the development of sustainable technologies capable of preventing the arrival of pharmaceutical waste in the environment.

Keywords: Legislation; Disposal; Pharmaceuticals; Waste.

INTRODUCTION

The advancement of science in the field of health has brought several benefits that have contributed to the improvement of the population's quality of life with the discovery of new drugs used to prevent, treat diseases, or alleviate their symptoms (LEÃO and SILVA, 2019). On the other hand, a discussion has involved public authorities, environmental and health specialists, and the productive sector, about what to do with expired or unused household medications. The improper disposal of pharmaceuticals is a common practice among the general population; most people dispose of pharmaceuticals incorrectly, in regular trash, toilets, or kitchen sinks, which poses risks to water, soil, animals, and public health (Figure 1).

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Figure 1. Improper disposal of medications can cause harm to health and the environment

Source: Data collected in 2010 by the company Brasil Health Service (BHS)

Another concern is the responsible management of waste generated by the pharmaceutical industry, due to the serious risks that operational failures, manufacturing process issues, and improper disposal of industrial waste can cause to public health and the environment (Figure 2).

Figure 2. Pharmaceutical residues are found in water intended for human consumption.

Source: Jornal da USP – Reproduction/Extracted from:
http://site.sabesp.com.br/site/interna/Default.aspx?secaold=47

In Brazil, industrial effluents represent a significant environmental problem. The existence of laws regulating the treatment of industrial effluents is essential for maintaining environmental balance and human health.

There have been advances in legislation; however, the management of pharmaceutical waste still presents significant deficiencies in treatment and final disposal aspects. According to the executive director of the Brazilian Association of Pharmacy and Drugstore Networks (Abrafarma), Sergio Mena Barreto, most municipalities do not have incinerators or special landfills. The unsustainable patterns of production and consumption pose a challenge in seeking strategies and measures to address the effects of environmental degradation and have become an increasingly relevant topic throughout this century (LENY, 2003).

The present study aims to conduct a survey of the environmental literature on the issue of pharmaceutical waste disposal and its impacts, taking an approach to the pharmaceutical production chain and identifying the challenges to be faced in order to minimize environmental impacts.

METHODOLOGY

The present study was developed through a systematic review, conducted through bibliographic and documentary research of laws, regulations, and standards related to the management of medications and medication waste, as well as the analysis of studies in the form of articles and academic journals published on the freely accessible internet platform – Google Scholar, and also through a systematic search on the scientific platform Web of Science® and Scientific Electronic Library (SciElo).

RESULTS

The lack of an effective system for the disposal of pharmaceuticals, combined with the population's lack of information regarding the correct disposal methods and their risks, leads the average citizen to discard expired or unused medications in inappropriate places, causing negative impacts on the environment.

The mechanisms to ensure the implementation of existing regulations and their observance have not had the necessary effectiveness, making it necessary to implement strategic actions that provide the population with a structure for the proper disposal of medications, with the application of technologies aimed at raising public awareness on the subject.

On the other hand, there is a lack of effective actions by the Public Authority in controlling and supervising the activities of pharmaceutical industries, necessitating the creation of more specific laws, as well as the intensification of the supervision of existing regulations.

CONCLUSION

After the execution of the entire proposed methodology, we hope to understand the state of the art and propose solutions to the current problem, such as developing educational materials encouraging environmentally friendly disposal, alerting the population about the risks of improper medication disposal, and proposing the reduction of waste through the rational use of medications. Furthermore, the results obtained can be used as support/reference material by scientific research groups and by the State with the aim of developing strategies for the elimination of pharmaceuticals in the environment.

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