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Evaluation of Sanitary Waste Generated by the Care of COVID Patients, in the Jipijapa Basic Hospital

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Abstract--In the current moments in which the world population lives related to the COVID-19 pandemic, a pandemic that has affected all countries worldwide, can only be contained based on the strategies taken by the entire population where hospitals play a fundamental role in mitigation and community transmission. The Jipijapa Basic Hospital is a health institution that has cared for patients infected with this disease. The objective of this research is to find out if the Environmental Risk Management system is complied with in the hospital center, fundamentally-oriented towards compliance with the regulations that regulate the management of sanitary waste in health establishments, in such a way that contamination to personnel is not produced. that works on the site, thereby allowing better environmental conditions to be achieved, mitigating the disease and its transmission mechanisms. For the study, a diagnosis was made on the initial management of sanitary waste, generated in health establishments by the care of COVID-19 patients, in addition to the observation and application of surveys to administrative personnel of the hospital. It was obtained as a result that the workers know and comply with the regulations for the collection of hazardous solid waste within the hospital.

Keywords--environment, hospital, pandemic, patients, sanitary waste.

Introduction

UN Climate Change Experts (IPCC) indicate that the reality of the problems caused by human activity is unquestionable, it has led the world to its warmest period in 2,000 years, and will have irreversible effects for millennia (IPCC, 2021), this situation makes governments must propose new strategies that allow the development of peoples and improve environmental conditions by creating new environmental protection and management plans.

Sustainability as a development model should have been developed in the different territories by implementing public policies and despite the efforts of some countries this has remained only in documents, despite the efforts of many researchers and scientists to propose and develop models for sustainable development that allow decision-makers have a starting point to draw up their management policies (Cortés Mura & Peña Reyes, 2015; From sustainability to sustainability. Sustainable development model for implementation in policies and projects), in other areas work has also been done. In search of sustainable development around energy, one of those that today most affects the emissions of pollutants into the atmosphere, soil and water (Pérez et al., 2019). Global warming and the destruction of the environment is an issue that is dealt with at the international level, based on the report of concern at the world level (Estenssoro Saavedra, 2010), in this sense, the excessive generation of waste is considered a problem for environmental sustainability (Lopez-Feldman et al., 2020), assuming a health risk for people who participate in waste management (WHO, 2020), hazardous waste constitutes one of the first environmental problems that society is currently exposed to globally. the Universal pandemic.

The COVID pandemic originating in China has spread to many countries in the world, which was considered as a global health outbreak established in the reported case statistics in China and other territories (Huarcaya-Victoria, 2020). The pandemic caused positive and negative impacts to the environment, the positive ones are related to the immobility of people, preventing transport from emitting emissions into the atmosphere and with it the respiratory problems caused to people (Jeong et al., 2016), as positive impacts The improvement of water quality is estimated, the reduction of greenhouse gases, the reduction of noise pollution (Delgado et al., 2016), but it should be noted that the negativity is showing in many aspects, such as the impact psychological to university students in China and other parts of the world (Cao et al., 2020); In addition to gender violence, one of the ills of the pandemic due to prolonged stays at home (Navarrete et al., 2020), in addition one of the most serious problems is causing the increase in environmental risks is the increase in hospital waste (Pedraza, 2010), the reality is that environmental policies and rivers have decreased, seas are receiving these high-risk solid materials, this is not only in China but also in other regions, due to the mismanagement of medical and protection equipment against coronavirus.

In Latin America and the Caribbean, sanitary waste management is in the beginning stage since there is no interest on the part of governments in investing or allocating resources (Abarca Fernandez et al., 2018), so waste management is more Beyond being considered a problem, the main factor is the lack of

environmental education in this situation. Indeed considers that in some countries the mortality rate from this disease depends on the health system, the conditions of care for patients have led to the generation of a greater volume of waste, the correct management of waste management sanitary facilities in health establishments, it is vital to contribute to the environment (Campo et al., 2016).

All health areas are responsible for the reduction and prevention of health problems in population communities (Tomás, 2016), considering that the health of workers depends on some factors, among which the generation of waste can be characterized with a high degree of danger some researchers such as (Bacigalupe & al., 2009), consider that those who establish adequate practices for infectious waste would have the responsibility of managing waste infected with SARS-Cov-2 (UNICEF, 2020), in this sense the organization develops guidelines for the management Inadequate sanitary waste can cause illnesses to workers as well as to personnel who are exposed in contact with these wastes, considering that bio contaminated waste contains a high viral load (Rivera, 2021).

The waste generated in hospitals is classified as having a high potential for danger since they have characteristics of biological and chemical risk, this increases the sanitary risk in health and in the environment (PAHO, 2020), another of the serious inconveniences presented by the management of waste is the lack of sites destined for final disposal such as sanitary landfills that affect wastewater (Torrella, 2020). This situation affects the quality of life of the population at the level, showing that the high rate of contagion is 53% associated with the lack of Personal Protective Equipment in workers (Angulo-Bazán & Solis, 2020). The government of Ecuador has a protocol for the management of waste generated in the event of a coronavirus COVID-19 which established the regulations of organizations and institutions for the management of infectious waste, but only a few speak specifically that of COVID-19 waste management; The reality has been different, because the implementation in the countries differs in their financial, technical, social and institutional capacity, causing, for example in the city of Quito, contamination by waste, it is not controlled with the management policies for its elimination and decrease, but there are difficulties between the sustainability of the management and the environment (Carrión & Cepeda, 2021).

Despite the transformations of the Ecuadorian health system (Jiménez-Barbosa et al., 2017), in the pandemic due to the high danger and contamination of this virus there have been difficulties with the management of waste in health houses and homes. (ALARCÓN HOLGUÍN, 2020), considering that what is generated by an infected person will be a dangerous waste, the increase and incorrect handling of this waste has caused a reversible effect on people's health (Sanchez Munar & García Méndez, 2021), according to report issued (WHO, 2021) (2) currently confirmed in 56 Latin American countries 72,645,349 confirmed cases with a percentage of deaths due to this pandemic of 1,910,213 until July 2, 2021 causing an increase of residues in what corresponds to the health areas including inadequate handling of the residues. With the pandemic an environmental challenge is generated, which humanity must accept and fulfill, according to (Gomez, 2020), degraded ecosystems cannot offer ecological services that guarantee well-being and health when the natural balance is broken, different

risks can be produced, Because health problems will always be subject to the interaction of each civilization with the environment, which depends on the nature of the man-nature relationship (Wang et al., 2020; Sim et al., 2013; Nyandra & Suryasa, 2018).

In Ecuador, since the pandemic began, there was a political and precarious public health fragility, economic inequalities already affected the country before the onset of the disease, this caused the damage faced in almost the entire national territory, fundamentally in the province of Guayaquil (Chauca, 2021). Comparative studies have been carried out in Ecuador, noting in many cases that a percentage of waste generated is due to mismanagement, mismanagement, or handling in health service areas are considered infectious. Other studies carried out in higher education institutions have shown that 60% of people become contaminated during the waste management process, causing these to increase treatment costs and environmental and health impacts (Saldivar de Salinas & Ferreira, 2018).

Within the Ecuadorian territory, the management of waste in health facilities is of utmost importance for the authorities as well as the final disposal of waste generated by direct care of COVID patients, considering it as environmental health risk (3), that is why that while the pandemic spreads globally, concern about waste management has become a priority issue to be addressed by seeking solutions to the problem, since as the infection spreads in the world, there is growing concern about how to manage the waste generated by infected patients. The main objective of the following research is to analyze the management of healthcare waste in the care of COVID-19 patients at the Jipijapa Basic Hospital, it was used as a qualitative-quantitative analysis methodology, to reach the appropriate results (Karagiannidis et al., 2010; Das et al., 2021).

Materials and Methods

The research involves the diagnosis and initial management of sanitary waste, generated in health establishments by the care of COVID patients at the Jipijapa Basic Hospital, located in the southern area of the province of Manabí, with the following coordinates 54383 / 9849621, In figure 1 the map will be shown. Figure 1.

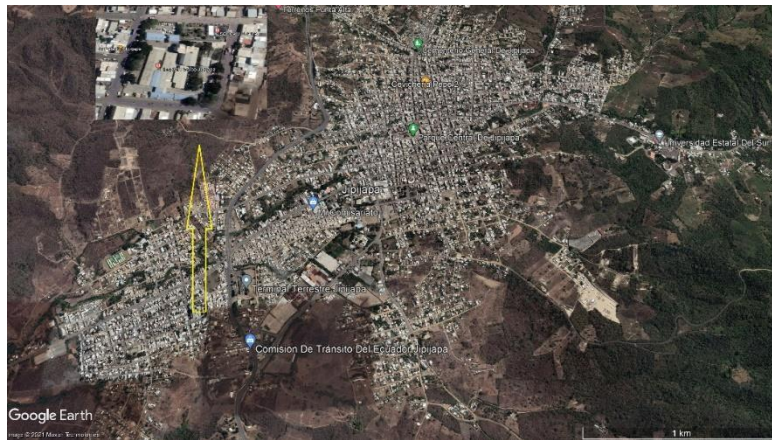


Figure 1. City of Jipijapa, location of the study area

The descriptive methodology and observation were used; In addition, the qualitative and quantitative method that helped the analysis of the variables according to the information obtained in-situ, information collection formats were adopted, the same that allowed evaluating the increase in the generation of sanitary waste during the pandemic between the years 2020-2021, considering sanitary waste as the unit of analysis. The population consisted of all hospital personnel, delimiting the sample with workers in charge of internal waste management, using a non-probabilistic sampling test.

To quantify the amount of waste generation, it was obtained by means of a monthly consolidated monthly management and generation of sanitary waste provided by those involved in the study, for the characterization of the type of sanitary waste generated in the areas of care for COVID patients, for this A waste characterization matrix was adopted applying the direct observation method in the study area, Ministerial Agreement 323 Official Gazette 450 of 20 - March 2019 "Regulation for the Management of Waste Generated in Health Establishments" was applied according to the objectives raised in the research, in addition to the Regulation for the prevention and control of contamination by hazardous waste (TULSMA, 2017), to establish compliance with the regulations, which are governed by the Ecuadorian state (Tripathi et al., 2020; Sharma et al., 2020).

Analysis and Discussion of the Results

There are different aspects about the deficit of management and handling of sanitary waste in the Jipijapa Basic Hospital, this problem led to the realization of the investigation where the sanitary waste generated by the care of COVID patients was evaluated, contributing to improve the performance of environmental management due to the fact that there is no research related to the subject, considering the lack of material resources and the little knowledge that the personnel in charge of waste management have in all its stages from generation to final disposal (Thyagaraju, 2016; Muliarta, 2016).

Route of hazardous waste

According to studies carried out, some methodologies help to visualize and know the route of hazardous waste in hospitals in Ecuador, where established standards and procedures are applied for its management and disposal (Andes, 2011). Figure 2 shows the steps to follow in the procedure.

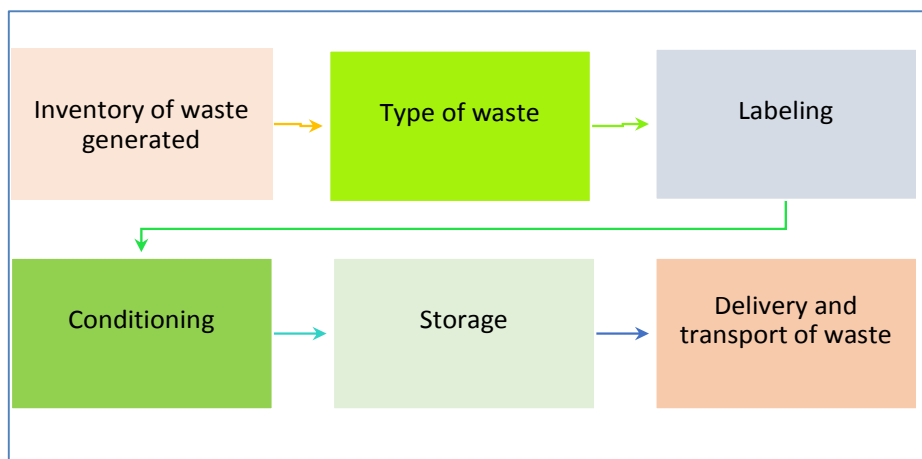


Figure 2. Steps to follow the procedure followed

As can be seen, six fundamental steps must be in this process so that contamination accidents do not occur. In the case of inventories, it is necessary for each laboratory hospital, or workshop to carry out an inventory of both conventional and hazardous waste generated in its area, in order to plan the management strategies to be developed. These aspects were analyzed through the application of instruments to hospital employees, according to (Bavaresco, 2020), it is considered a tool instrument or a means that provides direct information by the interviewer, through this technique it was possible to evaluate the knowledge that the staff has about the management of sanitary waste generated by patient care, using a questionnaire with questions related to the internal management and management of sanitary waste, which was validated by experts on the subject with the participation of collaborators who proceeded to review the instrument, its correlation with the study objectives (Noorimotlagh et al., 2021; Elavarasan & Pugazhendhi, 2020).

Modes of transmission of the COVID-19 virus

Respiratory infections can be transmitted through respiratory droplets, which have a diameter of 5 to 10 micrometers (μm), and through droplet nuclei, whose diameter is less than 5 μm .¹ According to available data, the COVID-19 virus is transmitted mainly between people through contact and respiratory droplets. In an analysis conducted in China that included 75,465 COVID-19 cases, no airborne transmission was reported (WHO, 2020).

It is good to note that studies carried out in some territories of Ecuador, COVID can be transmitted through wastewater (Franco, 2020). Researchers have found

traces of the SARS-CoV-2 coronavirus in the Machángara and Monjas rivers, which cross through the capital of the country, these infected by the wastewater that is dumped into them (EFE Verde, 2020), according to this page, also This phenomenon was found in Spain and France.

Risk management system in Jipijapa hospital

The investigation in the Jipijapa hospital was developed to know how the hazardous waste risk management system behaved in times of pandemic. One of the aspects considered was that; The greater the care of COVID patients, the greater the amount of sanitary waste is generated, for which a survey was applied to the administrative staff of the hospital, considering different aspects related to the risk management system, obtaining the results shown in figure 3.

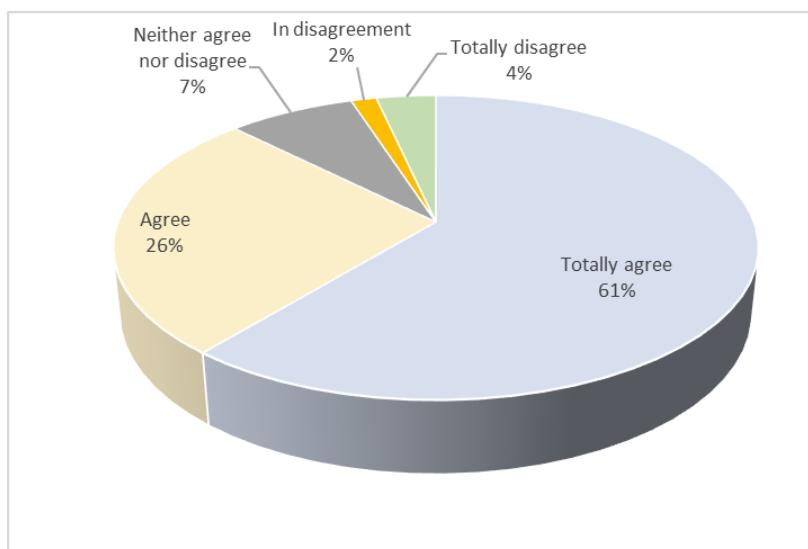


Figure 3. Results of the survey of the COVID patient care personnel

As can be seen, 61% of those surveyed fully agree that risk management is being met and 26% agree if we analyze variables, it can be seen that they have agreed that this risk management has been used during the pandemic. In addition, 10 managers of the hospital area were surveyed to verify different aspects that should be taken into account in the risk management system, for example: solid waste management was investigated, types, places of deposit, form of protection, analysis of critical areas, use of protection systems, classification according to color, frequency and collection route, type of storage, labeling and time (Bashir et al., 2020; Filladsen & Jordenzen, 2020).

Many of these aspects are found in the Ecuadorian technical standard for environmental management (INEN, 2014), which have been considered in the investigation carried out, in the investigation process it was observed that the administrative personnel know the regulations and the processes of environmental management. In this sense, it was investigated if the management of solid waste is adequately complied within the care of patients infected with COVID-19 in the hospital, obtaining as a result what is shown in figure 4.

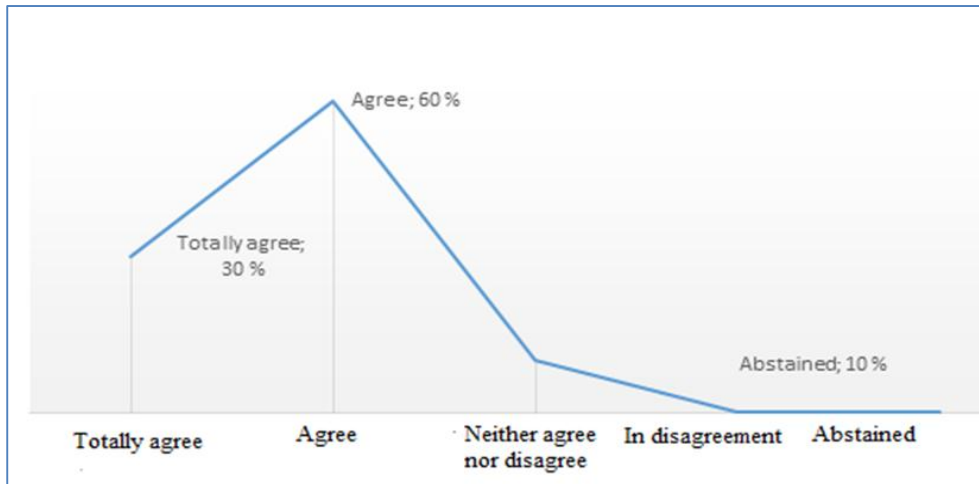


Figure 4. Adequate compliance with the management system of solid waste.

As can be seen in a general sense, 60% of those surveyed agree that the solid waste collection system is adequate, verifying what is stated in standard 2841: 2014 (INEN, 2014), referring to the transport, storage, and handling of materials with the requirements for placards, rectangular and square plates. In addition to graphic symbols, safety colors and safety signs. As evidenced in the research at the Jipijapa hospital, work has been done to ensure that the environmental management system and the risk of diseases and infections work properly, with the knowledge of the workers from the doctors, administrative staff and personnel who collect the data. residuals (Maemunah & Cuaca, 2021; Melnychuk et al., 2021).

Conclusion

The workers of the Basic Hospital of Jipijapa in the province of Manabí know the Ecuadorian technical standard for environmental management (INEN, 2014) and the environmental management processes, thereby mitigating contamination by the hazardous solid waste in the territory. It was obtained that 87% of the workers surveyed comply with the management of hazardous solid waste from the care of COVID-19 patients, complying with the steps to follow in the procedures of the established regulations.

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