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To Analysis the Necessity of Advance Sewage Treatment Plant (STP) Waste Management In Primary Health Care Centers (A Review)

Punam Vasudeo Gujar[1]*, Dr. More. A. B[2]

[1] PG Student, Dept of Civil Engg, DYPCOE, Pune, Maharashtra, India

Email: pvgujar2809@gmail.com

[2] Professor, Dept of Civil Engg, DYPCOE, Pune, Maharashtra, India

Abstract - The effluent from medical facilities poses a serious risk to human health because of how vulnerable people are to certain diseases. Additionally, the COVID-19 pandemic has called for a global awareness of the need to monitor infections and other resistant organisms in hospital wastewater and remove them. Apart from that, the presence of various resistant organics, pharmaceutically active compounds (PhACs), etc., creates a complicated pollution stack that affects biological systems and water resources. This survey has provided information on the occurrence, persistence, and removal of drug-resistant microbes, infectious diseases, and other micropollutants. The implementation of several pilot/full-scale measures has been evaluated with respect to the removal of pathogens, PhACs, biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), etc. Many organic forms, including constructed wetlands, actuated slime handles, and film bioreactors, were discovered to provide more than 80% evacuation of BOD, COD, TSS, etc. Nevertheless, some stubborn natural toxins are not as amenable to such treatments and necessitate the use of tertiary drugs such adsorption, UV treatment, ozone treatment, and so forth. Following the treatment of clinic wastewater, antibiotic-resistant bacteria and illnesses were discovered to be very persistent, necessitating high dosages of chlorination or UV therapy to render them inactive. This project involves the Govthospital exectting STP supplanted by modern innovation STP.

***Keywords:** Biological processes, Advanced oxidation processes, Antibiotic-resistant bacteria, Antibiotic-resistant genes, STP.*

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INTRODUCTION

Need Of Effective Waste Water management for Hospital:

Water is one of a hospital's most important resources. The water supply for the hospital must be properly designed, implemented, and ensured in terms of both operation and maintenance. Water availability is vital in the semi-arid region of Maharashtra. Water is essential to a hospital in large quantities, and the quality of that water is as crucial. The following water amount is suggested by the instructions.

Hospital (including laundry) per bed:-1. number of beds exceeding 100 = 450 litres per head perday.2. nurses/ staff quarters = 135 litres per head per day.3. minimum hot water requirements = 45 litres per head per day. so far as quality is concerned water supply should meet drinking water quality criteria prescribed by is 10500:2012 because it is this water which enters the distribution system ill it is used for dialysis or surgical or any section which requires more stringent water quality. .

Ensuring the quality of water is crucial for any residential or healthcare facility. Water used for domestic purposes must also adhere to IS10500:2012's requirements for drinking water quality.However, a hospital's water supply needs to be up to code in order to be used for drinking, dialysis, and operating rooms. The last two need to meet the standards established by the Indian Medical Council.

It was decided to look into the hospital in Maharashtra's current water supply system. The dependability of the hospital's water supply would depend on a number of factors, including the incoming water quality, system design, operation, and maintenance. Hospitals use water for things than drinking, dialysis, and operating rooms. Thus, chemical acceptability and microbiological purity—especially hardness and iron—are prevalent traits.

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The handling of garbage will be equally crucial. water management strategy: we can lower the hospital's water load by implementing the following water management techniques:

1) Water conservation: Water conservation issues must be solved using the three environmental r's:
Diminish: Water conservation starts with minimizing water usage, which is the most important part of utilizing water more effectively.Reuse: Water that has been used previously can be put to further use. The solution is in reusing less contaminated water—such as shower water.

2) Recycle: The treated /recycled effluent from stp can be used for gardening, toilet, road washing etc.

3) Meter/measure/manage: Water efficiency is raised when mechanical equipment is properly maintained and the facility's water usage is evaluated, both of which are aided by metering and gauging.

4) Enhance sanitary appurtenances (moisture less urinals, less flow toilets, spout flow control).

5) Use of waste water generated from the hospital shall betreated and reuse.

Hospital Waste Water Management Significance

In recent years, The daily water consumption of hospitals has increased significantly, and along with the advancement of medical technology, so has the volume of wastewater generated by these facilities. Sewage from hospitals that contains pathogenic and dangerous materials must be cleaned up before being disposed of in the sewer.

LITERATURE REVIEW

Group 1: Current Hospital Waste Management Issue

Timpua, 2019: .. Hospital liquid waste is garbage that endangers the health of people, the local ecology, and even the Earth as a whole. Killing pathogenic bacteria, dissolving particles, eliminating nutrients, dangerous compounds, and lowering BOD are the main objectives of wastewater treatment in order to protect the aquatic ecosystem and stop the spread of diseases from wastewater.

Busyairi et al., 2016 Medical services in hospitals Medical and non-medical operations can generate both solid and liquid waste. Infectious waste from medical procedures such as isolation rooms, pathogen and microbiology tests in polyclinics, and infusion fluids is included in hospital waste water. However, wastewater also includes non-medical effluent, such that from restrooms and kitchens, as well as wastewater that contains chemicals from research, sterilizing, and medical facilities.

Amouei et al., 2015 The amount of wastewater generated by hospitals has increased in line with recent improvements in healthcare. Hospital activities are the main cause of pollutants emitted into the environment. These operations include surgery, drug therapy, radiography, laundry, operating rooms, and chemical biology labs.

Group 2: Process of Hospital Waste Management

Kusuma, Laila, Darmadi, 2017). The rising demand for healthcare services by the general public leads to yearly rises in the number of hospitals. As a result, hospital operations will generate a rising amount of waste because hospital trash falls under the category of infectious waste, commonly referred to as B3 waste (Toxic and Hazardous Materials). The Advanced Oxidation Process is one technical approach to address this problem (AOP). The Third European Conference on the Application of Environmental Advanced Oxidation Processes hosted the third international conference on AOP technology from October 28 to 30, 2013, in Almeira, Spain.

Benouis et al., 2018 The vast array of drugs used to treat patients is the main source of chemical and biological contaminants in hospital wastewater discharge. Such emissions have the potential to seriously harm human health as well as seriously damage a variety of natural resources, such as soil and water. The investigation was conducted at the Hassani Abdelkader Hospital in Sidi Bel-Abbes, Algeria.

Compared to WHO standards of 90 mgO2/L, 30 mgO2/L, 0.5 mg/l, 1 mg/l, and 1 mg/l respectively, the results show a large amount of chemical pollution COD 879 mgO2/L, BOD5 850 mgO2/L, NH44: 47.9 mg/l, NO2: 4.2 mg/l, and NO3: 56.8 mg/l. However, since the ratio f COD to BOD5 is absent, this waste is biodegradable,).

(Benouis et al., 2017). Numerous studies on wastewater treatment have been carried out in the past in an effort to reduce negative environmental effects. Hospital activities are the main cause of pollutants emitted into the environment. These operations include surgery, drug therapy, radiography, laundry, operating rooms, and chemical biology labs.

Group 3: Need o fNew Desihn of STP for Hospital

(Busyairi et al., 2016) Hospital health services may generate solid and liquid waste from both medical and non-medical operations. Medical waste originates from pathogen and microbiological tests in polyclinics, isolation rooms, and IV fluids; non-medical waste water comes from trash from kitchens, bathrooms, and gardens. Wastewater containing chemicals can be generated in laboratories, sterilizing rooms, and medical facilities. Hospital effluent's physical, chemical, and biological characteristics can contaminate the environment.

Fachruddin Azwari et al., 2023). Consequently, in order to clean the wastewater that is released into

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rivers, a wastewater treatment plant (WWTP) is needed. Filters, enumerators, sand infiltration ponds, oil and grease infiltration ponds, equalization ponds, and other processing units are included in this plant. This study's objective was to determine the value of wastewater effluent—which contains BOD, COD, and TSS—after treating wastewater from various hospitals after the first step of settling and flotation is finished.

SUMMARY OF LITERATURE REVIEW

The research database was searched using selection criteria based on effluent and hospital wastewater for this study, which is a review of the literature. After reviewing the literature on the characteristics of hospital wastewater, use the publish or perish tool to search the Scopus indexed database, Google Scholar, and Semantic Scholar. The search term "hospital wastewater, characteristics" was used to locate academic publications pertaining to the topic of this investigation.

The collection includes journals published between 2018 and 2023. After finding 69 journal articles, which were selected based on abstract and title information, five journals were investigated to see if the articles met the author's inclusion criteria for use as material in a literature review. The study's content is made up of the research title, the name of the researcher, the publication year, the research location, the sample, the methodology, the research findings, and their significance level.

CONCLUSION

Hospital water management can be easily evaluated by looking at how well water is used without interfering with user department operations. Healthcare facilities are among the most prevalent kinds of establishments, and they require a lot of water to run on a regular basis. Hospital water management should receive special attention in order to eliminate the user facility's feasible cost and promote the nation's renewable development. A number of policies can be put into place to help hospitals take the required actions to improve their current water management practices and to have a better understanding of them.

The purpose of this study is to look into how healthcare facilities currently manage their water resources. The identified measures can be divided into two groups: strategies unique to healthcare facilities and generic approaches for managing water resources. Hospital administrators may greatly reduce the amount of water used by their facilities and mitigate the flaws of their current water management strategies by implementing this design. Since hospital wastewater discharges may contain significant percentages of pathogens, particularly bacteria resistant to antibiotics, in municipal wastewater, hospital wastewater management is an easily researched topic.

REFERENCES

1. Najar, H., Ghourab, A., Eid, R., & Farhouda, H. (2018). Medical Wastewater Characterization in the Gaza Strip: Al-Shifa Medical Complex as a Case Study. Health Scope, 7(3). https://doi.org/10.5812/jhealthscope.1 4513

2. Amouei, A., Asgharnia, H., Fallah, H., Faraji, H., Barari, R., & Naghipour, D. (2015). Characteristics of Effluent Wastewater in Hospitals of Babol University of Medical Sciences, Babol, Iran. Health Scope, 4(2), 4–7. https://doi.org/10.17795/jhealthscope - 23222

3. Anjana, RB (2021). Pre-design of the Waled regional general hospital wastewater treatment plant (WWTP). 2(1), 1–9. Benouis, K., Dahmani, S., & Berrebah, K. (2017).

4. Efficiency and Limits of Physicochemical Treatment of Dairy Wastewater (Case Study: Dairy Industry in Western Algeria). march. Benouis, K., Lousdad, A., Hamou, A., & Boufadi, MY (2018).

5. Physicochemical and bacteriological characterization of hospital effluents and their impact on the environment. Chemistry International, 4(2), 102–108. https://osf.io/rbka9 Busyairi, M., Dewi, YP, & Widodo, DI (2016).

6. The Effectiveness Of Calcium Hypochlorite To Chlorination Process In Decreasing The Amount Of Coliform Bacteria In The Wastewater Of X. Journal of Humans and the Environment, 23(2), 156. https://doi.org/10.22146/jml.18786 Carraro, E., Bonetta, S., Bertino, C., Lorenzi, E., Bonetta, S., & Gilli, G. (2016).

7. Hospital effluents management: Chemical, physical, microbiological risks and legislation in different countries. Journal of Environmental Management, 168, 185–199. https://doi.org/10.1016/j.jenvman.201 5.11.021 Fachruddin Azwari, Hadidjah, K., Christine Elia Benedicta, & Wahyuni, R. (2023).

8. Parameter Analysis of pH, BOD, TSS, Oil and Fat and Total Coliform in Liquid Waste at the Gateway Sehat Long Bagun Mahakam Ulu Hospital. Journal of Environmental Pollution Control (JPPL), 5(1), 45–51. https://doi.org/10.35970/jppl.v5i1.179 6 Fardian. E. (2022).

9. Biofilter Technology as Hospital Wastewater Treatment. Environmental Engineering

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Journal ITATS, 2(1), 28–34. Kusuma, Laila, Darmadi, A. (2017).

10. Sonochemical Treatment of Hospital Liquid Waste. Journal of Environmental Science, 7(1), 29–39. https://doi.org/10.14710/jil.20.4.841- 849 Pitriani,

11. P., Mutmainnah Maulani, Mutmainnah Maulani, Trivena Tatulus, Farida Indriani, Kiki Sanjaya, Nurdin, & Lusia Salmawati. (2022). The Effectiveness of Biofilters in Reducing Pollutants in Hospital Wastewater in Palu City. Affiliation : Journal of Public Health, 7(1), 245–253. https://doi.org/10.31943/afiasi.v7i1.19 6 Preisi Goni, Isri R. Mangangka, OBAS (2021). Evaluation of the Performance of the Wastewater Treatment Plant (WWTP) at the Central General Hospital Prof. Dr. RD Kandou

12. Manado. Techno, 19(77), 35–40. Timpua, RP (2019). Trial Design of Anaerobic Biofilter Media in Reducing BOD, COD, TSS and Coliform Levels in Hospital Liquid Waste. Journal of Environmental Health, 9(1), 75–80. https://doi.org/10.1134/s0320972519 100129

Corresponding Author

Punam Vasudeo Gujar*

PG Student, Dept of Civil Engg, DYPCOE, Pune, Maharashtra, India

Email: pvgujar2809@gmail.com n