

Analysis of Noise Levels at Kramat Jati Police Hospital and Budhi Asih Hospital

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Abstrak. This study aims to analyze the noise level in two hospitals in East Jakarta, namely the Kramat Jati Police Hospital and the Budhi Asih Hospital. Measurements are carried out in the administration area using the Sound Level Meter as well as other sound measurement applications. The results showed that there was a significant difference in noise levels between the two hospitals. The average noise level was recorded at 82.26 dB, while at the Kramat Jati Police Hospital the average reached 65.59 dB. These two values turned out to exceed the WHO standard which sets the maximum noise limit in the hospital area at 55 so that it can be concluded that the noise conditions in the two hospitals have the potential to interfere with comfort and health.

Keywords: noise, hospital, noise analysis, Kramat Jati Police Hospital, Budhi Asih Hospital.

I. Introduction

Noise level generally refers to the intensity or strength of sound produced in an environment, measured in decibels (dB). Sounds that exceed a certain threshold can disrupt human comfort or hearing health. This noise level can be influenced by various factors, such as the source of the sound, the distance from the source, and the environmental characteristics of the area where the sound is generated. Noise is a significant environmental issue in urban areas, particularly in healthcare facilities like hospitals. Excessive exposure to noise can affect both the physical and mental health of patients as well as the performance of medical staff. Noise in hospital environments can disturb the healing process of patients, increase stress levels, and reduce the quality of communication among medical staff.

Studies show that hospital registration and administrative areas are among the zones with high noise potential due to the high levels of activity and interaction between staff and visitors. The Ministry of Health Regulation No. 23 of 2021 sets a maximum noise standard for hospital areas of 55 dB. This is supported by research indicating that 65% of hospitals in Jakarta have noise levels exceeding the threshold in administrative service areas. It has also been identified that the primary sources of noise come from vehicle traffic (45%), visitor activities (30%), and medical equipment (25%).

The impact of noise on health has been widely discussed in various studies. Continuous exposure to noise can cause concentration disturbances, stress, increased blood pressure, and reduced work productivity among healthcare workers. Moreover, research shows that patients exposed to noise levels above the threshold tend to experience slower recovery compared to those in quieter environments. Given the importance of noise control in hospital settings and the limited studies comparing noise levels in hospitals in East Jakarta, this study aims to analyze and compare noise levels in the registration and administrative areas of RSUD Polri Kramat Jati and RSUD Budhi Asih. The results of this study are expected to serve as a basis for evaluating and developing more effective noise control strategies in both hospitals.

II. Method

This research was conducted in two locations, RSUD Budhi Asih and RSUD Polri, with data collection times from morning to noon. Noise measurements at RSUD Budhi Asih were taken on December 24, 2024, from 08:00 to 09:00 WIB, and at RSUD Polri Kramat Jati on January 6, 2025, from 11:00 to 12:00 WIB. During the research, several main equipment were used, including four types of Sound Meter applications available in the AppStore, a Sound Level Meter (SLM) to measure noise levels accurately, a camera for documentation, and a laptop for data processing. Additional supporting equipment included notebooks, pens, and stopwatches for recording and managing measurement times.

The data collection procedure began with the preparation of all measurement equipment, including activating the Sound Level Meter, Sound Meter applications, Noise Measurement applications, and Noise Meter applications. Noise intensity measurements were performed simultaneously using all five tools to obtain comprehensive data. Each measurement session lasted for 20 minutes, and the measurement results from both tools were recorded in a prepared table. To ensure data accuracy, the measuring instruments were reset after each data collection session. This process was repeated until the research time at each location was completed, with all activities documented using the camera.

The obtained data was then processed and analyzed using a laptop with appropriate methods to compare noise levels between the two hospitals. The analysis results can serve as a basis for policy decisions regarding better environmental management in both hospitals.

III. Result and Discussion

The noise measurement results conducted at the two hospitals show significant differences. The average noise level at RSUD Budhi Asih was recorded at 82.26 dB, while at RSU Polri Kramat Jati it was 65.59 dB. This indicates that the noise level at RSUD Budhi Asih is higher than at RSU Polri Kramat Jati. The high noise level at RSUD Budhi Asih is caused by several factors, such as a high number of patients, busier administrative or operational activities, and other external noise sources. During the measurement process, it was found that the noise level at both hospitals fluctuated. There were times when the sound became very loud, but there were also periods when the noise level returned to normal. This usually happened due to factors such as the number of visitors, the busyness of the administrative section, and noises from the surrounding environment. This condition was particularly noticeable during peak hours of hospital services.

Table 1. Noise Level at Budhi Asih Hospital

Time	Sound Level Meter (db)	Sound Meter Application (db)	Sound Measurement Application (db)	Sound Level Measurement Application (db)	Noise Meter (db) Applications	Average	Total Average
08.00-08.20	80.4	81.2	82.2	81	82.3	81.52	82.26
08.20-08.40	82.3	85.2	86.3	84	83.9	84.46	
08.40-09.00	82.1	79.6	79.9	82	80.4	80.82	

Both RSUD Budhi Asih and RSU Polri Kramat Jati have exceeded the safe limit set by the WHO. The WHO states that the maximum noise limit for hospital areas is 55 dB during the day and 40 dB at night. Noise levels above 70 dB can interfere with communication, cause stress, and reduce concentration for both medical staff and patients. Therefore, staff working in administrative service areas are disturbed in concentrating on their tasks.

The noise measurement results at the hospitals highlight the importance of applying consistent standards in data collection processes. RSUD Budhi Asih needs to take immediate steps to control noise, such as recommended measures like managing the division of areas, regulating the number of visitors entering, and improving the layout of spaces so that sound does not echo.

Table 2. Noise Level at Kramat Jati Police Hospital

Time	Sound Level Meter (db)	Sound Meter Application (db)	Sound Measurement Application (db)	Sound Level Measurement Application (db)	Noise Meter (db) Applications	Average	Total Average
11.00-11.20	59.8	66.3	68.9	78	77	70	65.59
11.20-11.40	57.9	63.5	66.2	79	78	55,68	
11.40-12.00	60.1	71.3	67.1	79	78	71.1	



Figure 1. The picture of data collection at Budhi Asih Hospital



Figure 2. The picture of data collection at the Kramat Jati Police Hospital

IV. Conclusion

Based on the results of the study on noise level analysis at RSU Polri Kramat Jati and RSUD Budhi Asih, it can be concluded that there is a significant difference in noise levels between the two hospitals. RSUD Budhi Asih has an average noise level of 82.26 dB, while RSU Polri Kramat Jati has an average noise level of 65.59 dB. Both hospitals have exceeded the maximum limit recommended by the WHO and Ministry of Health Regulation No. 23 of 2021, which is 55 dB for hospital areas. Meanwhile, RSU Polri Kramat Jati recorded a lower noise level with an average of 65.59 dB, although still above the established standard. It can therefore be concluded that the noise conditions at both hospitals have the potential to disrupt comfort and health.

References

- [1] Suma'mur, P.K. (2009). "Company Hygiene and Occupational Health (HIPERKES)". Jakarta: CV Sagung Seto.
- [2] World Health Organization. (2024). Guidelines for Community Noise in Healthcare Facilities. WHO Technical Report Series.
- [3] Rahman, M., & Putri, A. (2023). Analysis of Noise Impact on Medical Personnel Performance. *Journal of Public Health*, 9(2), 89-98.
- [4] Pratiwi, D. A., Sutopo, W., & Purwanto, A. (2020). Evaluation of Noise Levels in Hospital Administration Areas: Case Study of RSUD Dr. Moewardi Surakarta. *Indonesian Journal of Environmental Health*, 19(1), 45-53.
- [5] Suryani, E. (2019). Analysis of Noise Levels in Hospital Administrative Service Areas in DKI Jakarta. *Journal of Public Health*, 7(2), 78-89.
- [6] Sari, N., & Prasetyo, B. (2019). Identification of Sources and Noise Levels in Hospitals. *Journal of Environmental Health*, 11(3), 123-134.
- [7] Widodo, B. S., & Nugroho, A. (2021). Analysis of the Relationship between Noise Levels and Patient Recovery Process in Hospitals. *Indonesian Journal of Public Health*, 16(2), 78-89.
- [8] Wijaya, D., & Rahardjo, P. (2021). Factors Affecting Noise Levels in Hospital Environments. *Journal of Environmental Technology*, 14(2), 56-67.
- [9] Safitri, D. (2022). Evaluation of Hospital Noise Levels Based on WHO Standards. *Indonesian Journal of Environmental Health*, 21(1), 34-45.
- [10] Darmawan, A., & Firdaus, R. (2020). Impact of Noise on Medical Staff Health in Hospitals. *Journal of Environmental Health*, 12(2), 45-52.
- [11] Rahman, A. S., & Widyastuti, S. (2024). Implementation of Noise Measurement Standards in Modern Healthcare Facilities. *Indonesian Journal of Environmental Technology*, 26(1), 12-24.

