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Yedilbayev, B., Amirtayeva, S., Ismailov, Z., Akimbayeva, Z., Shokanova, A.

[The role of ultraviolet light in air cleaning: A mini review on microbial and pollution control.](#)

2nd International Conference on Sustainable Environment, Development, and Energy (CONSER 2025).
October 22-23, 2025, Yogyakarta, Indonesia.

Since the onset of the COVID-19 pandemic, the importance of indoor air quality (IAQ) has gained significant attention, as SARS-CoV-2 and other infectious agents can spread through inhalable aerosols. Air-cleaning devices that combine filtration with pollutant-targeted treatments offer a promising approach to improving IAQ. Yet, relatively few filtration systems incorporating UV (Ultraviolet) technology have undergone rigorous performance testing, and publicly available data on their effectiveness, including comparable UV doses, remain limited. In this study, we enhanced an existing particulate matter (PM) filtration prototype by integrating germicidal UV-C light to expand its disinfection capability. This mini review explores the application of ultraviolet (UV) light as a method to improve indoor air quality by reducing airborne bacteria, viruses, and pollutants. UV disinfection is shown to be effective in inactivating microorganisms while also contributing to the reduction of particulate pollution, thereby supporting healthier indoor environments. Importantly, the study emphasizes that UV technologies achieve the greatest impact when integrated with other engineering controls, such as filtration and ventilation, offering a comprehensive strategy for protecting human health.

Kim, J., Kim, J.-H., Sung, M.

[Analysis of Indoor Air Quality in Inpatient Wards using IoT Sensor Data and Machine Learning.](#)

14th International Symposium on Heating, Ventilation, and Air Conditioning (ISHVAC 2025). November 29-December 2, 2025, Tokyo, Japan.

Since COVID-19, interest in Indoor Air Quality (IAQ) has increased and research has been conducted on Airborne Infection Isolation Rooms (AIIRs), but more research is needed on long-term IAQ analysis in hospitals. IoT sensors were used to acquire data from Patient Room (PR) and AIIR, and long-term data is used to analyse IAQ. Clustering was performed on target space. Unlike PR and AIIR, Nurse Station (NS) has a full-time occupancy and CO₂ concentrations above 1,000 ppm occurred frequently. For temperature, NS, PR, and AIIR all remained within the 23 to 26 °C range, although AIIR occasionally exceeded 30 °C. For PM_{2.5}, the overall average remains below 20 µg/m³ in NS, PR, and AIIR. However, it remained largely unchanged in NS, but sharp events with concentrations above 100 µg/m³ occurred frequently in PR and AIIR. The overall PM_{2.5} concentrations were well maintained, but the frequent PM_{2.5} peak concentrations were very high for short periods of time and need to be further managed. IoT sensors can be utilized to acquire continuous IAQ data in wards. IAQ management is required through continuous measurement using IoT sensors. The large amount of IAQ data acquired can be utilized in various ways by applying machine learning.
