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THERMAL COMFORT AND VENTILATION CONDITIONS IN HEALTHCARE FACILITIES - PART 1: AN ASSESSMENT OF IEQ

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Abstract

Healthcare facilities provide a cure from the ailment while maintaining a clean environment. A high indoor environmental quality (IEQ) can improve the recovery process and create a pleasant working environment. And, a poor IEQ causes nosocomial diseases that are harmful to the patients as well as the hospital staff. To assess the state of IEQ in selected local hospitals, the current study investigates critical IEQ parameters. Based on a detailed literature synthesis, three parameters are selected (temperature, relative humidity, and CO_2) for IEQ assessment in four local hospitals. Four different locations (emergency room, OT, ICU, and medical ward) in each hospital are considered with respect to the existing HVAC system. Data is recorded on a 5-min interval for 6 days uninterruptedly and the mean hourly value for each location is calculated for 24 hours. Statistical analysis is performed to compare the day- and night-time IEQ trends. A significant difference is found in the day- and night-time observations for OTs while random trends are noticed in emergency areas. The results govern the fact that occupancy rate, ambient thermal conditions, type of HVAC system and building orientation are vital drivers of IEQ. In conclusion, design and retrofitting recommendations are provided.

Keywords: CO_2 concentration, healthcare facilities, HVAC system, indoor environmental quality, thermal comfort

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