

Indoor Air Quality (IAQ) At Preschool Environment in Urban Area Of Section 7, Shah Alam

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Structured Abstract

Background: Preschools are an early childhood education program that support the development of children's growth but there is also a concern on children's health that can be affected by the indoor air pollution. The study focused on investigating the indoor air quality (IAQ) within preschool settings, through the assessment of chemical, biological, and physical parameters. The project also aimed to analyze the significance in variation across sampling points and cycles through ANOVA, as well as to assess potential health effects associated with IAQ through a risk assessment framework.

Methods: Methodologies for this study included on-site measurements of pollutants such as volatile organic compounds (VOCs), particulate matter (PM), carbon dioxide (CO₂), and biological contaminants. In parallel, questionnaire surveys were administered to preschool occupants, including teachers, staff, and parents, to gather insights of IAQ conditions and associated health symptoms. Furthermore, a comprehensive risk assessment has been conducted to evaluate the potential of carcinogenic and non-carcinogenic risks posed by identified IAQ pollutants. The risk assessment utilized a method by the U.S Environmental Protection Agency (EPA) a calculation for Excess Lifetime Cancer Risk (ELCR) for carcinogenic risk and Hazards Quotient (HQ) for non carcinogenic risk.

Results: The overview of the IAQ in the preschool showed there are four parameters exceeded acceptable limits, CO₂ (up to 1505 ppm), PM_{2.5} (0.009- 0.014mg/m³), Temperature (26.9- 28.4°C), Total Bacteria Count(553 - 1045.45 cfu/m³)As for the Analysis of Variance (ANOVA) showed pollutants like CO (p=0.002), TVOCs, (0.045), PM₁₀ (p= 0.028) and PM_{2.5} (p=0.029) varied over time, while CO₂, formaldehyde, temperature, and humidity remained stable. Lastly, the risk assessment identified there are carcinogenic and non-carcinogenic risks associated with exposure to PM_{2.5} and PM₁₀ in the preschool.

Conclusion: In conclusion, this study successfully assessed the Indoor Air Quality (IAQ) in a preschool setting and its potential impact on children's health. This final year project contributes valuable insights into the IAQ challenges specific to preschool settings in urban areas, offering practical recommendations for enhancing indoor environmental quality and promoting healthier learning environments.

Keywords: Indoor Air Quality, Parameters, ANOVA, Risk,

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