

ASSESSMENT OF INDOOR AIR QUALITY LEVELS IN HOMES: A CASE STUDY FROM KEGALLE DISTRICT

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Previous studies have predominantly focused on outdoor air quality, often assuming that ambient air is the primary source of pollution. However, evidence indicates that individuals spend most of their time indoors. Making outdoor measurements insufficient for accurately assessing overall exposure to particulate matter (PM_{2.5} and PM₁₀) are key indoor pollutants that can exacerbate respiratory conditions. This study aimed to evaluate indoor environmental PM_{2.5} and PM₁₀ concentrations in Galigamuwa DS Division, Kegalle through a cross-sectional study using parent-reported health questionnaires, and a case-control study utilizing air samples for PM measurement. There was a sample size of 50 houses in the Galigamuwa DS Division in the Kegalle District and, through a stratified random sample, only houses using firewood stoves were selected. In the first stage, a random sample of 5 out of the 53 GN Divisions in the Galigamuwa Division was selected, for the second stage systematic random sampling was applied to select households within these GN Divisions. Finally, parents living in the selected households were invited to participate, representing the targeted group for this study. This multistage sampling ensures a representative distribution across the study area while focusing on household characteristics that influence indoor environmental quality and children's health. Statistical analysis employed descriptive statistics to assess PM levels in the study area, conducted using SPSS software. The result indicated that PM_{2.5} and PM₁₀ levels exceed 60% of national standards or international thresholds (0 -50µg/m³) in households, consistently recording PM concentrations between (60-70µg/m³) across all Households, indicating elevated indoor air pollution. Such levels surpass recommended guidelines for safe indoor air quality, passing potential health risks, particularly for children who are more vulnerable to respiratory issues due to prolonged exposure. These findings underscore the importance of adopting better ventilation. However, despite the acceptable levels, the study recommended further improvements in ventilation systems to maintain and potentially reduce particulate matter (PM) levels over time. Additionally, the findings emphasized the need for stricter indoor air quality regulations to ensure long-term protection against potential health risks. Implementing these recommendations could lead to a sustained reduction in PM levels within home environments, ultimately minimizing respiratory health risks in similar settings.

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