UNIVERSITI TEKNOLOGI MARA

INDOOR AIR QUALITY IN SELECTED CHILDCARE CENTERS IN KLANG, SELANGOR

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Project paper submitted in partial fulfillment of the requirements for the degree of Bachelor in Environmental Health and Safety (Hons.)

Faculty of Health Sciences

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Declaration by Student

Project entitled Indoor Air Quality In Selected Childcare Centers In Klang, Selangor is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Mr. Megat Azman Bin Megat Mokhtar as Project Supervisor and Mdm Siti Rohana Binti Mohd Yatim as Co-supervisor. It has been submitted to the Faculty of Health Sciences in partial fulfillment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons.)

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Mohd Rikyhanas Bin Mohd Nasir, July 2013

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Abstract

Indoor Air Quality in Selected Childcare Centers in Klang, Selangor

Mohd Rikyhanas Bin Mohd Nasir

A comparative cross sectional study on selected pollutant concentration level of PM_{10}, CO_2 and CO, and physical air quality parameters such as ambient temperature and relative humidity between 15 selected childcare centers that is categorized by area (residential, urban and industrial) in Klang, Selangor. Objective of the study is to determine the indoor air quality in selected childcare centers in Klang, Selangor. The level of air pollutant (CO_2 and CO) concentration and physical air quality parameters (ambient temperature and relative humidity) have been measured using EVM 7 for outdoor and IAQ meter for indoor environments. Air movements or velocity was measured using kestrel 1000 anemometer. For PM_{10}, Dust Trak 2 have been used both for indoor and outdoor environments. Walkthrough assessments have been held before conducting the study in order to determine suitable sampling points and details of childcare centers have been noted. The different concentration and correlation of air pollutants, physical air quality parameters were analyzed using SPSS for statistical analysis. The acceptable limit of physical and chemical air parameters was based on Industrial Code of Practice on Indoor Air Quality by Department of Occupational Safety and Health, Malaysia (DOSH). Result showed that, the mean concentration of ambient temperature in each area (residential, urban and industrial) were exceeding the standard limits of Code of Practice on Indoor Air Quality 2010 by DOSH, whereas for relative humidity and air movements, the mean concentration for each area are complying with the standard limits. For indoor air pollutant concentration measurements, only PM_{10} level in industrial area is exceeding the standard limit given, while measurement in each areas for CO_2 and CO were both complying with the standard limits. There is a significant difference between CO_2 and air movement between indoor and outdoor measurement in residential area. For Urban area, there is significant difference of relative humidity, CO_2 and air movement between indoor and outdoor mean concentration while in industrial area, there are no significance different. The exposure dose for particulate matter, PM_{10} in residential area is 0.023 (m/g)/kg, in urban area is 0.044 (mg/kg)/day whereas for industrial area, it is the highest with 0.078 (mg/kg)/day. As a conclusion, there are a few parameters of physical air and selected pollutant concentration levels were exceeding the standard limits in residential, urban or industrial areas. There also a significantly differences between indoor and outdoor concentration of pollutants such as relative humidity, air movements and carbon dioxide. The exposure dose calculated for child in industrial childcare centers recorded as the highest compare to residential and urban areas.

Keywords: Air Pollutant, Concentration, Indoor Air Quality, Ambient Temperature