UNIVERSITI TEKNOLOGI MARA

EXPOSURE TO PARTICULATE MATTER $PM_{2.5}$ AND PM_{10} IN HOSPITAL WARDS, KUALA LUMPUR

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Project submitted in 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

The project entitled *"Exposure to Particulate Matter $PM_{2.5}$ and PM_{10} in hospital wards, Kuala Lumpur"* is a presentation of my original final project in fulfillment of the requirements for the degree of Bachelor in Environmental Health and Safety (Hons.). I hereby declare that this project is fully written by me and also is my own effort; I am sure that it is no part has been plagiarized without citations. Wherever contributions of others are involved, every effort is made due reference to the staffs, lecturers, literature, and acknowledgment of collaborative research and discussions. The project was done under the guidance of Megat Azman Bin Megat Mokhtar as a Supervisor.

Student's signature:

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In the name of Allah, the Most Gracious and Most Merciful.

Alhamdulillah, all praise to Allah for the strength and whom with His blessing giving me the opportunity to complete this Final Year Project. This Final Year Project was prepared basically for the student in final year to complete the undergraduate program that leads to the degree of Bachelor in Environmental Health and Safety (Hons.).

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ABSTRACT

The particles in the air that contribute to air pollution are made up of hundreds of different chemicals. Some of the particles were emitted through directly from the sources known as a primary pollutant such as particulate matters, which are suspended particle. Since many people were not realized about the indoor air pollutants are more dangerous compared to outdoor air pollutants and it can cause bad health effects to human's health especially respiratory problem. The public area such as the hospital is one of the places which the respiratory problems often happened. The main sources of particulate matters at the study location were mobile emission because the building of hospital wards was surrounded by the busy roadsides and also exposed to the construction activities. The aims of this study was (i) to determine the concentration of particulate matter $PM_{2.5}$ and PM_{10} in hospital wards, Kuala Lumpur, (ii) to compare the concentration of particulate matter $PM_{2.5}$ and PM_{10} at every Floor Level of hospital wards and (iii) to measure the exposure assessment of particulate matter $PM_{2.5}$ and PM_{10} concentration to workers in hospital wards. The cross-sectional study design was applied in this study and the air sampling's instrumentation was used during data collection of particulate matter $PM_{2.5}$ and PM_{10}. The findings of this study were the average concentration of particulate matter at every Floor Levels was higher proportion of exposure concentration of $PM_{2.5}$ compared to exposure concentration PM_{10}. The p-value ($p=0.001$) of this study was less than 0.01. Independent sample t-test analysis showed the higher proportion of exposure concentration of $PM_{2.5}$ compared to exposure concentration PM_{10}. In conclusion**,** the average daily exposure dose of inhalation (adults) (i) non-carcinogenic risk (9.08 µg/kg/day and 6.92 µg/kg/day) and (ii) carcinogenic risk (3.11 µg/kg/day and 2.38 µg/kg/day), for both particulate matter $PM_{2.5}$ and PM_{10}, respectively. It means that the average daily exposure dose of inhalation to $PM_{2.5}$ was significantly higher than exposure concentration of PM_{10} to the worker in hospital wards, Kuala Lumpur.

Keyword: Particulate matter, $PM_{2.5}$, PM_{10}, mobile emission, hospital wards, Floor Level, exposure assessment