UNIVERSITI TEKNOLOGI MARA

STUDY OF FINE PARTICULATE MATTER ($PM_{2.5}$) AND THE HEALTH EFFECTS AMONG FACTORY WORKERS

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Project Paper Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor in Environmental Health and Safety (Hons)

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Declaration by Students

Project entitled "A Study of Fine Particulate Matter (PM $_{2.5}$) and Health Effects among Factory Workers" 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 Mrs. Nadiatul Syima Mohd Shahid as a Project Supervisor and Mr. Nasaruddin Abd. Rahman 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).

Student's signature

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Abstract

STUDY OF FINE PARTICULATE MATTER ($PM_{2.5}$) AND HEALTH THE EFFECTS AMONG FACTORY WORKERS

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Introduction: Sources of indoor air pollution that release gases or other particles into the air are the primary cause of indoor air quality problems in homes. Lack of ventilation system can cause the increasing indoor pollutant levels because there is no exchange process occurs between outdoor airs to dilute emission from indoor sources. Building material and furnishing, asbestos, wet and damp carpet, cabinetry or any formaldehyde made up from woods products, household cleaning product, personal care, central heating and cooling system, and humidification devices, and outdoor sources such as Radon, pesticides and outdoor air pollution.

Methodology: The study was conducted in the factory which consists of 5 departments according to their functioning process. The location of the factory is at SKF Bearing (M) Sdn. Bhd, kawasan perindustrian Nilai. The study is a cross-sectional study .It was done by comparing the lung function performance and the health effect among less exposed group and exposed group with the exposure to the $PM_{2.5}$. Human health risk assessment of each worker has been calculated by using Louvar F. Joseph and Louvar B. Diane (1995) method. Analytical and descriptive statistical analysis was determined using SPSS version 17.

Results: The study found that most of the workers exposed group get health effect due to the presence of high level concentration of $PM_{2.5}$ ($0.223 mg/m^3$). From the analysis showed, the result for lung function performances for the exposed workers is below the normal average for the adults. Since the p value < 0.01, there are significant health effects such as irritated eyes, headache, chess tightness, irritated throat and coughing among these two groups. Inhalation rate for Human Health Risk assessment approximately 0.020 mg/ kg^{-day}.

Conclusion: In conclusion, from the findings of the study high reading of $PM_{2.5}$ detected during the air sampling. From the analysis there were significant health effects with the $PM_{2.5}$ exposure.

Keywords: Indoor Air Quality, Fine Particulate Matter ($PM_{2.5}$), Human Health Risk Assessment.