

UNIVERSITI TEKNOLOGI MARA

**A STUDY OF SELECTED VOLATILE ORGANIC
COMPOUNDS EXPOSURE AND LUNG FUNCTION
PERFORMANCE AMONG PETROCHEMICAL
WORKERS**

NUR HAZIANA BINTI NORZAN

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

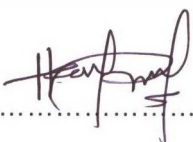
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Declaration by Student

Project entitled "A Study on Selected Volatile Organic Compounds Exposure and its Lung Function Performance among Petrochemical Workers" is a presentation of my original research work. Whenever 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 PM Rodziah bt. Ismail as Project Supervisor and Mr. K. Subramaniam 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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Nur Haziana Binti Norzan

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Abstract

A Study of Selected VOCs Exposure and Lung Function Performance Among Petrochemical Workers

Nur Haziana Binti Norzan

Introduction: Volatile organic compounds (VOCs) are organic chemical compounds whose composition makes it possible for them to evaporate under normal indoor atmospheric conditions of temperature and pressure. In petrochemical industry, the chemical materials that used are very toxic to human when inhale which can cause acute respiratory effects such as headache, breathlessness, sorethroat, nose running, eye irritation and cough. Studies found that impairment in lung function performance among petrochemical workers are related to various work-related factors including exposure to volatile organic compound that produce from occupational hazard materials.

Methodology: The study was conducted in petrochemical industry located at Gebeng, Pahang Darul Makmur. The study design of this study is cross-sectional study. Sampling data collection using Pocket Pump, Thermal tube desorption, vitalgraph spirometry, oral interview and modified American Thoracic Society Questionnaire. A statistical analysis that is statistical package for the social science (SPSS) version 17.0 was used in this study.

Results: The study was found that most of the workers in exposed group exposed high concentration of benzene, toluene and xylene (BTX) compared to unexposed group. Mean for benzene, toluene and xylene in exposed group were 0.20, 2.64 and 4.45 meanwhile in unexposed group were 0.05, 1.63 and 2.10. There is significant difference in lung function test between exposed group and unexposed group (FVC, $p=0.001$; FEV₁, $p=0.001$; FEV₁/FVC, $p=0.015$). Only 2 symptoms of respiratory problem from the study showed significant association ($p<0.05$). The prevalence of headache and breathlessness for exposed group (headache=32.5% breathlessness=32.5%) is higher than unexposed group (headache=21.3% breathlessness=18.8%). this study also found inverse correlation between BTX concentration and lung function performance among both groups.

Conclusion: In conclusion, high exposure of selected VOCs concentration able to reduce the lung function performance among the workers in petrochemical industry. There was significance difference between benzene, toluene and xylene concentration among the exposed group and unexposed group. Finding also showed a significance difference between benzene, toluene and xylene exposure and lung function performance among the workers and a significance association between selected VOCs and respiratory symptoms among the exposed and unexposed workers

Keywords: VOCs, lung function performance, respiratory symptoms, benzene, toluene, xylene