

Declaration by Student

Project entitled Comparative Study Of Ambient Air Quality (Pm2.5, No2, So2) And Lung Function Performance Among College Students is my original research of 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 discussion. The project was done under the guidance of Assoc Prof. Hazilia Hussain as Project Supervisor and Ms Farah Ayuni Sahafea Shafie 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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Date : 31/5/2011

ACKNOWLEDGEMENT

All praise bet to Allah SWT the Al Mighty, The Most Gracious and The Most Merciful.

I would like to forward my appreciation to everybody who contributed to the accomplishment of my dissertation, my project supervisor, Prof Madya Hazilia Hussain and co- supervisor Ms Farah Ayuni Shafie for the priceless guidance, advices, understandings, support and valuable time to me able to understand and successfully completed my study within time.

Special thanks to my parents, Abd Hamid Abdul and Jamiah Sanusi for their encouragement and support. For the rest of the family, my brothers Muhammad Tasnim and Muhammad Zulkifli, and oldest sister, Shahrizat, thank you so much for your help.

Thank you so much to my handful lab partner, Syed Fahimi Syed Mokhtar and helpful Mahsa College representative, Alif Zain for the strong support and assisting me to complete my project through thick and thin.

Lots of appreciation from me to Mr Muhammad Azwat Abdullah, Assisstant Science Officer and Mr Shafie Md. Latep, Laboratory Assistant for the support and assisting me for all this time.

Finally, to all my friends, who had gone through thick and thin for 4 years together, thank you for all of your great advice and opinions. In any circumstances, I would not forget to thank to those who indirectly and directly were involved during this research.

Thank you ~

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Abstract

A Comparative Study of Ambient Air Quality and Lung Function Performance among College Students

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Background: A comparative cross-sectional study was done to assess lung function performance and the current ambient air quality in two areas as consequences of exposure to traffic pollution. The locations selected were college that is situated at urban (Damansara) and suburban (Puncak Alam) area. To observe the effects, college students from both areas were being taken as study respondents.

Methods: Numbers of parameters were selected during this study including the concentration of air pollutants Particulate Matter 2.5 (PM_{2.5}), Nitrogen Dioxide (NO₂) and Sulphur Dioxide (SO₂). The pollutants concentration is measured at both locations for 1 hour for NO₂ and SO₂ and 24 hour for PM_{2.5} using EVM7 (Quest). Lung function test have been done to 90 respondents (N=90) at both locations using Spirometer (Vitolgraph) to identify their lung performance status (FVC, FEV₁, FEV₁/FVC). To the same respondents, questionnaires also being distributed to obtain their feedback about air quality and current health status based on self diagnose approach. The relationship between air pollutants concentration and lung function performance is analyzed using SPSS version 17.0 to search for the significances.

Results : Result shows that there is significance different of the pollutants concentration between the study locations ($p < 0.05$) on two parameters which are PM_{2.5} and NO₂. Significant difference also existed between the lung function performances in urban and suburban areas ($p=0.001$). Among three data taken for lung function performance, FVC% and FEV% shows significance different with p value each are 0.002 and 0.005. Inversely proportional relationship between FEV₁% with PM_{2.5} ($p= 0.028$) and FEV₁% with NO₂ ($p=0.044$) which means the higher the concentration of PM_{2.5} and NO₂, the poorer the lung function performance in the locality. Respondents self diagnosis questionnaire shows significance different in two short term effects being asked, which is eye irritation ($p=0.0012$) and dizziness ($p=0.017$). Among three parameters measured, only PM_{2.5} concentration exceeds the EPA standards, while the rest, are below the RMAQG standards.

Conclusion: Study found out that students in urban area are exposed to higher concentration of ambient air pollutants compare to students in suburban area and showed a decrease in their lung function performances.

Keywords : *Particulate Matter (PM_{2.5}) , Lung Function Performance, Traffic Pollution*