UNIVERSITI TEKNOLOGI MARA

EXPOSURE TO INDOOR AIR POLLUTION (PM_{10}) AND ITS ASSOCIATION WITH LUNG FUNCTION AND RESPIRATORY PROBLEM AMONG COMMUNITY (HOUSEWIVES) LIVING NEAR A RICE MILL

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In the name of Allah, the most Gracious, the most Merciful

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Abstract

EXPOSURE TO INDOOR AIR POLLUTION (PM_{10}) AND ITS ASSOCIATION WITH LUNG FUNCTION AND RESPIRATORY PROBLEMS AMONG COMMUNITY (HOUSE WIVES) LIVING NEAR A RICE MILL

Nor Abidah binti Abdullah

A cross-sectional study was carried out on housewives who lived close to rice mill at Pendang, Kedah. The objective of this is to study the association between exposures to indoor air pollution (PM_{10}) and respiratory problem among housewives living near a rice mill. The 60 exposed housewives to rice mill were selected in this study. Confounding factors has been controlled by excluded the respondent with asthma, pulmonary tuberculosis (PTB), bronchitis and smoking habit. The houses which are use air conditioning system and under construction or renovation inside their home has been excluded. Questionnaires obtained from American Thoracic Society's Division of Lung Diseases (ATS-DLD-78-A) were used in interview the housewives to get their background and respiratory symptoms. Housewives lung function was measured by Chest Graph Spirometer Model HI-101. The indoor PM_{10} was monitored in the house for 12 hours and 24 hours for outdoor by using Sensidyne Air Sampling Pump. The result of indoor PM_{10} showed the mean is 109.56±29.75 ug/m^3 and the range of indoor PM_{10} is 60.59 ug/m^3 to 158.82 ug/m^3. There is significant different between concentration level of indoor and outdoor PM_{10} ($p<0.001$). Mean 24 hours outdoor PM_{10} levels (181.96±9.78 μg/m^3) were higher compared to indoor levels of PM_{10} (109.56±29.75 μg/m^3). There is significant correlation between concentration level of PM_{10} and indoor environmental factor which is usage of carpet ($r=0.275$, $p=0.034$). There is also significant correlation between concentration level of PM_{10} and distance of house from rice mill ($r=-0.395$, $p=0.002$). Mean FVC% predicted is 90.25±18.47, (89.24±15.24) FEV_1% predicted and FEV_1/FCV% predicted (113.09±5.69). There were 71.7% are normal for FCV%, 16.7% (mild), 10% (moderate) and 1.7% are severe. However, there were 76.7% are normal for FEV_1%, 18.3% (mild) and 5% are moderate. Predicted of FEV_1/FCV% are normal for all respondents. The respiratory symptoms experienced by respondent are cough (50%), phlegm (31.7%), breathlessness (33.3%), wheezing (25%), chest illness (23.3%), and episodes of cough and phlegm (20%). The result from t-test showed that the concentration of indoor PM_{10} is below the standard concentration of outdoor PM_{10} is above the guideline and concentration of outdoor PM_{10} was exceeding the Recommended Malaysian Air Quality Guidelines set up by the Department of Environmental which is 150 μg/m^3. Concentration of outdoor PM_{10} is higher than in indoor. The most respiratory symptom experienced by respondent is coughing.

Keywords : *PM_{10}, lung function, respiratory symptoms, housewives, rice mill*

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Particulate matter (PM) is a collective term used for very small solid and/or liquid particles found in the atmosphere. While individual particles cannot be seen with the naked eye, collectively they can appear as black soot, dust clouds or grey hazes. Particulate matter may be generated by natural processes (e.g., pollen, bacteria, viruses, fungi, mold, yeast, salt spray, soil from erosion) or through human activities, including diesel trucks, power plants, wood stoves and industrial processes. Individual particles vary considerably in size, geometry, chemical composition and physical properties. The effect of particulates on human health and the environment varies with the physical and chemical makeup of the particulates. Particles are either emitted directly into the atmosphere or produced in the atmosphere from the physical and chemical transformation of other vaporous or gaseous pollutants (Masitah *et. al.*, 2007).

Air pollution in industrialized are is a concern of wide variety of people, however, air pollution in restricted areas such as rice growing area attracted attention and little is known among general population. Effect of air pollution on respiratory disease in industrial areas has been studied in these decade, however little is known about the effects of rice husk dust and its smoke as air pollutants in agricultural areas. Aggravation of airway symptoms has been experienced among people living in rice growing areas during rice harvesting season.