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EFFECTS OF AIR POLLUTION ON HUMAN HEALTH:PERSPECTIVE OF UNIVERSITY STUDENTS

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ABSTRACT

Air pollution has significant effect to human health, agriculture and ecosytem. There are numerous reports pertaining to the effect of air pollution on human health, agriculture crops, forest species and ecosystem. The objective of this study is to look at the perspective of university students about the effects of air pollution on human health. 46 respondents from Universiti Teknologi MARA Pulau Pinang have been selected randomly to participate in this pilot study. The research finding shows that on average 73.8% students have knowledge on the effect of air pollution to their health. Result with mean of 4.09 implies that students are mostly concerned about the environment for children while they are less concerned about the asthma incidences cause by air pollution.

Keywords: Health; Air Pollution; API Index; Survey.

1. INTRODUCTION

The Department of Environment (DOE) Malaysia uses Air Pollution Index (API) to compare itself with other regional countries. The API was adopted after the Department of Environment Malaysia has revised its index system in 1996. The API closely follows the Pollutant Standards Index (PSI) system of the United States (Department of Environment Malaysia, 1997). Table 1 shows the API for Malaysia which compares the values in terms of the level of pollution and health measures. Afroz, Hassan, and Ibrahim, (2003) reported that the main air pollutant in Malaysia is carbon monoxide (CO), sulphur dioxide (SO_2), nitrogen dioxide, and other particulate matter, with an aerodynamic diameter of less than 10 µm.

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Table 1: Comparison of API Values With Level of Pollution and Health Measures

API scale	Status	Level of Pollution	Health Measures
0 - 50	Good	Low pollution and has no ill effects on health.	- No restriction of activities for all group of people - To practice healthy lifestyle e.g. not to smoke, exercise regularly and to observe proper nutrition.
51 - 100	Moderate	Moderate pollution and has no ill effects on health.	- No restriction of activities for all group of people - To practice healthy lifestyle e.g. not to smoke, exercise regularly and to observe proper nutrition.
101 - 200	Unhealthy	Mild aggravation of symptoms among high risk person e.g. those with heart or lung disease.	- Restriction of outdoor activities for high risk person. - General population should reduce vigorous outdoor activities.
201 - 300	Very unhealthy	Significant aggravation of symptoms and decreased exercise tolerance in person with heart or lung disease.	- Elderly and person with known heart or lung disease should stay indoor and reduce physical activities. - General population should reduce vigorous outdoor activities. - Those with any health problems to consult doctor.
301 - 500	Hazardous	Severe aggravation of symptoms and endangers health.	- Elderly and person with existing heart or lung disease should stay indoor and reduce physical activities. - General population should reduce vigorous outdoor activities.
Above 500	Emergency	Severe aggravation of symptoms and endangers health.	- General population advised to follow the orders of the National Security Council and always to follow the announcements through the mass media.

(Source: Department of Environment (DoE), Malaysia. (2010).)

Short term and chronic human health may occur when the concentration levels of air pollutant exceed the air quality guidelines (QUARG, 1996 ; Lee, 2010). Nasir et al, (1998) reported in 1997 (haze episode in Malaysia) the estimated negative effect to health for asthma attacks were 285,277 cases, 118,804 cases of bronchitis in children and 3889 cases in adults, and in addition, respiratory hospital admissions (2003 cases) and emergency room visits (26,864

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cases).World Health Organization(1998) reported that outpatient treatment for respiratory disease in Kuala Lumpur General Hospital had increased from 250 to 800 per day and for outpatient in Sarawak increased between two to three times during the haze episode in 1997. Besides that, Brauer and Jamal (1998) found that haze episode in 1997 was also resulted in the increase of asthma, conjunctivitis and acute respiratory infection.

Md Yusof (2009) said PM_{10} can primarily cause reduction in visibility by light scattering. Visibility has a significant strong correlation with the increases in mass concentration of nitrate, elemental carbon element and sulphate (Kim et al., 2006). Numerous research on the effects of PM_{10} to human health and environment have been done by researchers worldwide.

However, this study focuses on UiTM students' perceptions towards the effect of air pollution to their health and human life. It is hoped that the findings of this study will bring awareness to students and community about the harmful effects of air pollution and the importance of having clean air in our environment.

2. METHODOLOGY

A questionnaire-based perception survey was conducted in March 2014 involving tertiary level students aged between 18 to 25 years old in Seberang Jaya, specifically in UiTM Pulau Pinang. Seberang Jaya is one of the locations which is believed to be highly exposed to air pollution due to the factories and highways around it. The survey was done through a random sample where respondents were asked about their perception of air quality and how air pollution affects their health and life. Each item was answered using a five-point Likert scale from strongly disagree to strongly agree and the table of Level of Mean Score Interval is used to identify the result. The Reliability test was also conducted on the sample and the value of Cronbach Alpha as shown in Table 2 indicates a high level of internal consistency. This shows that all items in the survey have a high reliability to be used in our real study.

Table 2: Reliability Statistics

Cronbach's Alpha	Number of Items
.880	12

3. RESULTS AND DISCUSSION

This study involved a group of 46 respondents which consist of 15 males and 31 females. Descriptive statistics were used to analyze twelve items to show how students were affected by the air pollution. Over half (58.7%) of the respondents identified that they are very much affected by the air pollution, 34.8% a little affected and 2.2% are not affected at all.

Figure 1 below shows the highest mean of 4.09 and the lowest of 3.05 which indicates that most of the respondents were very concerned about the environment for children followed by what they need to do to stay healthy. On the other hand, they were less worried about the possibility of getting asthma incidences.

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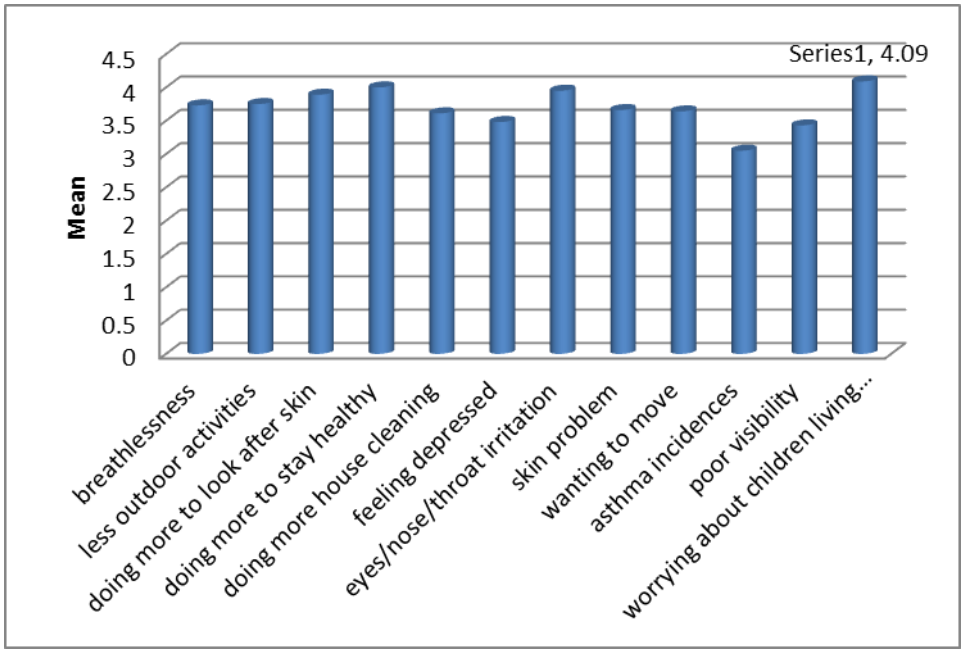

Figure 1: Bar Chart for The Causes of Air Pollution

The overall result in Table 3 shows a very consistent opinion with the previous result. Using the Level of Mean Score Interval in Table 4 it can be concluded that the mean 3.6894 indicates all respondents agree that somehow the air quality will affect the quality of their life. This mean value also implies that on average 73.8% students have knowledge on the effect of air pollution to their health. The hazardous air may affect our health, physical look and our mind depending on the current health status, types of pollutant and the length of exposure to the polluted air.

Table 3: Average Descriptive Statistics

	N	Minimum	Maximum	Mean
mean	44	1.83	4.58	3.6894
Valid N (listwise)	44			

Table 4: Level of Mean Score Interval

Mean Score Interval	Interpretation	Level
1.00 – 2.49	Do not agree	Low
2.50 – 3.49	Not totally agree	Moderate
3.50 – 5.00	agree	High

Source: Kamariah, N. 2008

From the clustered bar chart below, it was observed that the percentage of respondents supporting that air pollution is harmful to health is always higher than not supporting it. Nine out of twelve items asked shows a percentage of more than 50% for strongly agree. The highest percentage is 79.6% for 'doing more to look after my skin' followed by 77.2% for

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'worrying about children living environment'. The lowest percentage is 31.8% in terms of 'worrying about asthma incidences'. From these twelve items asked, six items referred to health problems with the average percentage of 57.95%, which indicates that respondents pay a lot of attention of their health.

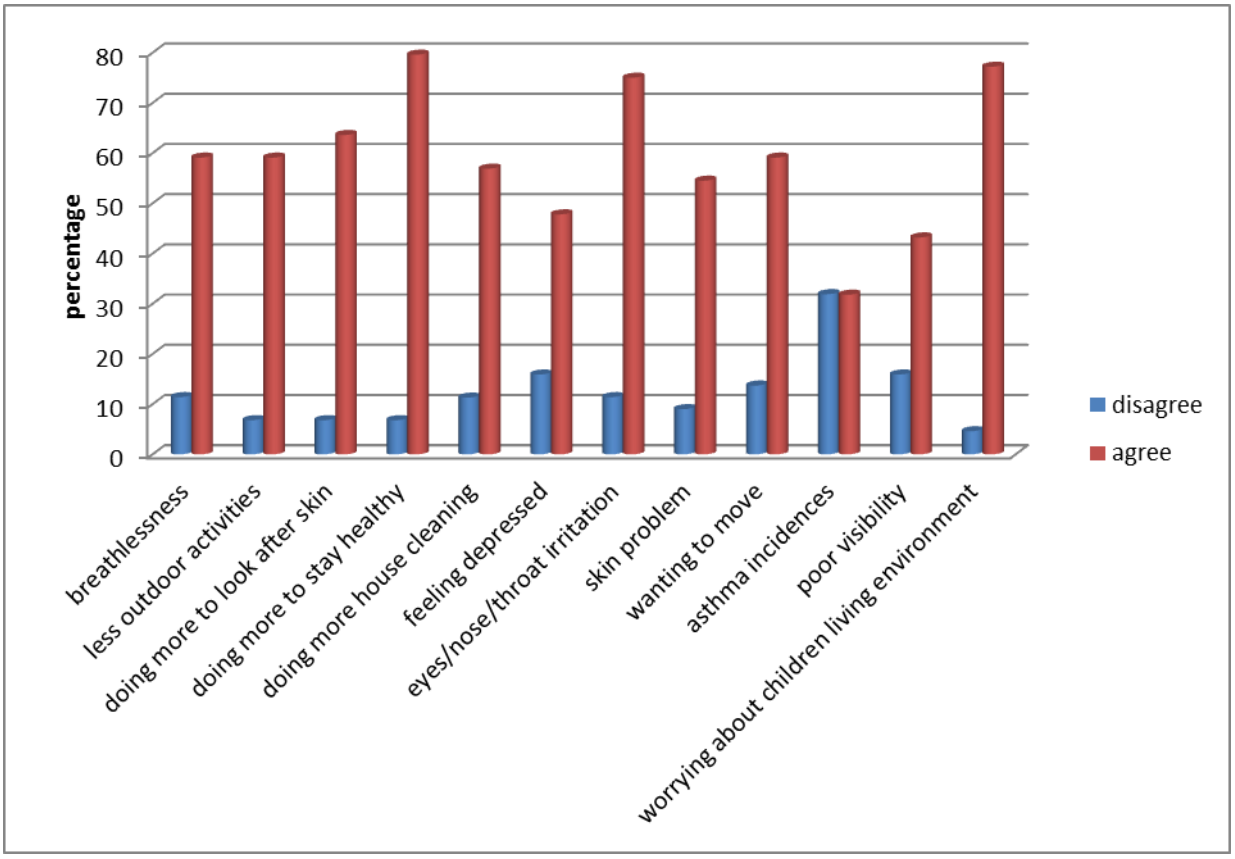

Figure 2: Clustered Bar Chart Showing The Responses for Each Item

4. CONCLUSION

This study revealed a high perception of health risk among students where students perceive their environment to be better for the future generation. They are well aware to the effects of air pollution on their health and daily activities. Poor air quality will affect everyone, but some people are particularly sensitive to air pollutants, particularly children. Despite the fact that many of them are aware of these effects, a small group of them may still indulge in high risk behaviours that may lead to air pollution within the community. Raising awareness on air pollution is one of the most pragmatic ways that can work effectively in preventing and mitigating the effects of air pollution. Therefore campaigns in universities and schools can be utilized to improve the level of awareness among students.

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