

UNIVERSITI TEKNOLOGI MARA

**AIR QUALITY IN SMALL AND
MEDIUM WOOD-BASED
ENTERPRISES AND HEALTH
EFFECTS AMONGST EXPOSED
POPULATION**

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Thesis submitted in fulfilment
of the requirements for the degree of
Master of Sciences

Faculty of Health Sciences

February 2017

ABSTRACT

Exposure to air contaminants such as wood dust and volatile organic compounds (VOCs) can cause adverse health effects among the exposed workers. It was found that several personal exposures to total dust exceeded the 5 mg/m^3 . Negative relationship ($p < 0.05$) was found between personal exposure to TVOC and FEV_1/FVC . Significant mean differences ($p < 0.05$) was found between personal exposures to TVOC with drowsiness/dizziness and breathing difficulty. There was significant difference ($p < 0.05$) in personal exposure to total and respirable dust with skin irritation among workers where significance association was also found between respirable dust concentration (≤ 3 or $> 3 \text{ mg/m}^3$) with skin irritation. Significance association ($p < 0.05$) was found between dusty workplace with coughing and irritated nose and between chemical odour and irritated nose. Carbon dioxide concentration in all of the SMEs did not exceed 9000 mg/m^3 . VOCs such as toluene, acetic acid, and acetic anhydride were detected in the collected air samples from the SMEs. Only half of the SMEs have installed mechanical ventilation to properly maintained ventilation inside workplace. 64.29% ($n=9$) of the SMEs had insanitary condition (excessive dust). In conclusion, exposure to dust and TVOC in wood-based SMEs can cause health effects such as coughing, irritated nose and drowsiness/dizziness among workers. Due to lack of TVOC standard in Malaysia, it was hard to determine if workers are exposed to high level of TVOCs. Further studies are needed to determine the effect of different particle sizes of wood dust and the contribution of TVOCs to health effect among workers in wood-based SMEs.

ACKNOWLEDGEMENT

First and foremost, I would like to thank God for giving me the opportunity to embark on my Master and for completing this challenging journey successfully. Gratitude and thanks go to my supervisors Prof. Dr. Subramaniam Karuppannan and my co-supervisors, Ir. Nimi Ahmad and Mr. Ng Wei Khiang whom have guide me toward the right direction and spending their precious time in helping me from the developing proposal, to method development and completion of this thesis.

Special thanks and appreciation for my parent who unfailing support and understanding has help me throughout my study. I would also like to thank my siblings and other family member for their moral support which allow me to continue my study.

My thanks also go to lecturers and laboratory staff of Department of Environmental Safety and Health as well as officers from Majlis Bandaraya Shah Alam and participating industries that had contributed in the data collection process.

Lastly, many thanks to my friends (Noradila Mohamed, Muhammad Afiq Zaki, Alia Azmi, KamariahYakob, Sajidah Md. Sirat, Siti Norashikin, Anis Zakiah, Nazrieza) and colleagues (Nur Izzati, Faizak Ishak, Nurul Aziemah) who help out in data collection, give input for statistical analysis and report writing. Thanks for the all the help and support.

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

Historically, the Malaysian economy was led by the primary industries such as agriculture, mining and quarrying. However, since 1990, Malaysia has been successfully transformed from a commodity-based economy to the industrialized economy, in which manufacturing activities started dominating and gradually become the leading sectors. During the economic crisis of Malaysia in 1997, many foreign investors started to shift and relocate their investment to small and medium enterprises (SMEs) that has seen to be more profitable especially those that offer low labor costs and higher returns. Thus, SMEs become well-known as backbone of the economic growth in industrial development in Malaysia which contributed to the economic development by their numbers and increasing share in total employment and Gross Domestic Product for Malaysia. This helped the Malaysian economy by strengthening the resilience of the economy to face challenging and competitive global market (Normah, 2007)

Based on the Census on Establishment and Enterprise that was conducted in 2005, there were 523132 businesses operating in Malaysia and from these businesses, SMEs were almost 518996 (99%) of the total establishments in Malaysia of which 411849 establishments were micro enterprises. Most of the SMEs (86.5%) were involved in the services sector while 7.3% were involved in the manufacturing sectors while the remaining 6.2% of the SMEs were involved in agriculture sectors (National SME Development Council, 2005).

SMEs have generated approximately 3.0 million employments for this country in three main sectors which are the services sector, manufacturing sector and agriculture sector. Thus, SMEs have employed 2.3 million full time workers (76.5%), 501000 (16.7%) self-employed workers and 204000 (6.8%) part- time workers (Normah, 2007).

Based on the census published by Bank Negara Malaysia in 2005 there have over 3 million workers employment that represent 65.1% of the total employment of