

UNIVERSITI TEKNOLOGI MARA

**RELATIONSHIP BETWEEN INDOOR AIR QUALITY
AND SICK BUILDING SYNDROME AMONG
STUDENTS IN TWO DIFFERENT LABORATORY
BUILDING AT UiTM**

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Declaration by Student

Project entitled "Relationship between Indoor Air Quality and Sick Building Syndrome among Students in Two Different Laboratory Building at UiTM" is a presentation of my original research 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 discussions. This project was done under the guidance of Mr. Mohd Izwan bin Masngut as Project Supervisor and Professor Madya Rodziah Ismail 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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"In the name of God, the most Gracious, the most Compassionate"

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TABLE OF CONTENTS

TITLE	PAGE
ACKNOWLEDGEMENTS	i
TABLE OF CONTENTS	ii
LIST OF TABLES	iv
LIST OF FIGURES	vi
LIST OF APPENDICES	vii
LIST OF ABBREVIATION	viii
ABSTRACT	ix
CHAPTER ONE: INTRODUCTION	
1.1: Background Information	1
1.2: Problem Statement	5
1.3: Study Justification	8
1.4: Study Objectives	11
1.5: Study Hypothesis	12
1.6: Conceptual Framework	13
1.7: Conceptual and Operational Definitions	14
CHAPTER TWO: LITERATURE REVIEW	
2.1: Indoor Air Quality	15
2.2: Factor that Affecting the Indoor Air Quality	16
2.3: Exposure of Chemical Contaminants to Human Body	18
2.4: Sick Building Syndrome	23
2.5: Legislative Requirement	24
CHAPTER THREE: METHODOLOGY	
3.1: Study Location	27

ABSTRACT

Relationship between Indoor Air Quality and Sick Building Syndrome among Students in Two Different Laboratory Building AT UiTM

Introduction: Different laboratory characteristics will have different indoor air quality (IAQ) and will cause health problem such as sick building syndrome (SBS).

Methodology: A cross-sectional comparative study design was used in this study to assess indoor air quality in two different campus buildings and also conduct the survey of the sick building syndrome symptoms among the university students there. This study involved 192 students consisting of 100 students from Faculty of Health Sciences (FHS) and 92 from Faculty of Applied Sciences (FAS). The students were interviewed by using Air Quality and Work Symptoms Survey, NIOSH (National Institute Occupational Safety and Health) Indoor Environmental Quality Survey (1991). IAQ was monitored by using EVM 7 series and follow the guideline of Industry Code of Practice Indoor Air Quality Guideline 2010, DOSH, Malaysia.

Results: Air flow rate was significantly higher at FAS building compared to FHS building due to use of individual unit of HVAC system at mean 0.04 and 0.34 m/s respectively. There was significantly higher prevalence of SBS among old new building and new building ($X^2= 21.9$, $p<0.001$). Mann Whitney test showed there were significantly higher indoor air pollutants in the old building compared to new building: for CO ($z=-5.713$, $p<0.001$), TVOC ($z=-2.168$, $p=0.03$), $PM_{2.5}$ ($z=-5.250$, $p= p<0.001$). Independent-t test showed there were significantly higher of relative humidity ($t=1.402$, $p=0.022$) and CO_2 ($t=0.392$, $p=0.031$) at FAS building compared to FHS building. Result from simple linear regression showed there was a significant linear relationship between the level of indoor air quality and indoor air pollutants and prevalence of SBS for CO_2 ($b= -0.001$, 95% CI=-0.003,0.000 and $p=0.031$) and Relative Humidity ($b= -0.078$, 95% CI=-1.264,0.583 and $p=0.438$) at FAS building.

Conclusion: This study suggested that increasing indoor air pollutants, temperature and humidity may influence the occurrence of SBS among students. A further study is suggested to identify the risk of exposure to IAQ level and relationship with SBS.

Keywords: *Indoor Air Quality (IAQ), Sick Building Syndrome (SBS), CO, CO₂, PM_{2.5}, TVOC, RH, Temperature*