A Cross-Sectional Study on the Levels of Knowledge About the Health-Related Risks of Secondhand Smoke Exposure Among University of Cyberjaya Students

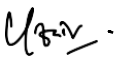## Ruvanita Devi[1], Fitri NurZahuri Banu[2], Uzair Hazim[3]

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Abstract

Background: The influence of tobacco smoking's harmful consequences is not just confined to those who smoke actively but has an impact on those who are passive smokers or exposed to secondhand smoke (SHS) . Passive exposure to secondhand smoke (SHS) poses significant health risks, especially in areas where exposure is prevalent like Malaysia, despite strict anti-smoking regulations. Thus, addressing tobacco addiction and raising awareness about the dangers of smoking and SHS are critical, particularly given the younger generation's perceptions and knowledge about these issues. *Objectives*: The current study assessed the level of knowledge of University of Cyberjaya students about SHS-related risks, and then investigated the factors associated with knowledge. *Methodology:* This is a quantitative cross-sectional study on the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students. The research was conducted for 12 months starting from 25/09/2023. The sociodemographics of the respondents and the smoking status were analysed using descriptive statistics. The significance between University of Cyberjaya students' level of knowledge on SHS-health-related dangers was determined using chi-square analysis. *Results*: 371 respondents had completed the questionnaire. The result were that 70.35 % of the students in University of Cyberjaya had adequate level of knowledge while 29.65 % had inadequate knowledge. The study found no significant correlation between various sociodemographic factors and the level of knowledge about secondhand smoke (SHS) risks among University of Cyberjaya students, except for nationality, residency, housing, and academic year.**Conclusion:** This study indicates that students in University of Cyberjaya have adequate knowledge, regarding health-related risks of secondhand smoke exposure. Further initiatives must be done to enhance the knowledge level of the remaining 29.65% of students who have inadequate knowledge and this highlights considering specific demographic factors in efforts to enhance awareness of SHS-related health risks among university students.

DECLARATION

We hereby declare that this research is the result of our own research investigations, except where otherwise stated. We do not have any conflict of interest with the content this research study. We also declare that it has not been previously or concurrentkly submitted for any other faculty or institutions.

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CHAPTER 1
INTRODUCTION
1.1. Background of study

More than 8 millions people die from tobacco-related diseases every year, making it one of the largest public health problems the world has ever faced. The World Health Organization (WHO) estimates that more than 7 millions of those fatalities are directly related to tobacco use, while the remaining 1 million are caused by second-hand smoke exposure in non-smokers. More than 80% of the 1.3 billion tobacco smokers worldwide reside in low- and middle-income nations. A policy should be implemented in the most effective way possible based on effective monitoring, which tracks the scope and nature of the tobacco epidemic. Only 1 in 3 countries, or 38% of the world's population, according to the World Health Organization, keep track of tobacco use by repeating national representative youth and adult surveys at least once every five years (World Health Organization, 2020). These concerns have severe impacts, especially in places where SHS exposure is common. SHS is still a major worry in Malaysia despite the country's tighter anti-smoking laws, which prohibits smoking in public places and states specifically it is for ensuring the safety of individuals who do not smoke by preventing their contact with tobacco smoke and its emissions, especially focusing on those below 18 years old.

The influence of tobacco smoking's harmful consequences is not just confined to those who smoke actively; it also affects people who are passive smokers or those who are exposed to secondhand smoke (SHS). Inflammatory bowel disease and endothelial cell dysfunction, for instance, are chronic diseases that children of smokers are more likely to develop (Chivese et.al, 2015; Messner & Bernhard, 2014). Smoking parents' children are also more likely to experience immediate health issues like respiratory and ear illnesses. In addition, the presence of SHS has been linked to metabolic deficiencies like DNA and lipid oxidative damage. Moreover, people who have been exposed to SHS exhibit diminished antioxidant

mechanisms in patterns comparable to those seen in smokers who are still smoking, such as lower levels of vitamin C and vitamin A(Wilson et.al. 2011). As a result, SHS exposure is causally linked to decreased immune function, reduced lung functions, increase risk of stroke, coronary artery disease, and various long-term health conditions, very much like active smoking is (US Office on Smoking and Health, 2006) . The children exposed to SHS are at a higher risk of developing leukemia, brain tumors, and lymphomas than children who are not exposed (US National Center for Chronic Disease Prevention and Health Promotion - Office on Smoking and Health, 2014; Mustafa Kamal et al., 2019) . While health risks from secondhand smoke are rarer compared to those from active smoking, the possibility of negative effects even at very low levels of exposure implies that there is no clearly safe threshold for an exposure (Committee on the Public Health Implications of Raising the Minimum Age for Purchasing Tobacco Products et al., 2015). This underscores the importance of addressing such a public health issue. These concerns have severe impacts, especially in places where SHS exposure is common. SHS is still a major worry in Malaysia despite the country's tighter anti- smoking laws, which prohibit smoking in public places and specifically aim to protect individuals who do not smoke, particularly those under 18 years old (Ministry of Health of Saudi Arabia, 2015). At home, around 30% of adolescents are exposed to secondhand smoke, and approximately 37.5% of adolescents between the ages of 13 and 15 are exposed to smoke outside, according to a national survey that was part of the Global Youth Tobacco Survey (World Health Organization, 2010).

Hence, it is more important than ever for health professionals to treat tobacco addiction and inform the public about the health hazards associated with smoking and secondhand smoke. Brief counselling has been found to significantly boost quitting rates (Stead et al., 2013; 2008 PHS Guideline Update Panel et al., 2008). Appropriate counselling does provide a number of challenges, though. These factors encompass a deficiency in self-assurance and confidence in one's capability to offer counseling, a lack of knowledge about the risks associated with SHS exposure and the techniques for quitting, insufficient allocated time, and the absence of suitable cessation services integrated into healthcare systems (Jradi & Al-Shehri, 2014).

These difficulties are exacerbated by the attitudes and levels of knowledge that the younger generation have on smoking and exposure to SHS, as well as several local studies point to a gap in medical education curriculum in nicotine dependency treatment and tobacco-related subjects, particularly in bachelor years 18–20.

Consequently, our goal was to profile the healthiness of students' lifestyles and learning environments and to shed light on the gaps in their understanding of SHS.

The current research evaluated the understanding of University of Cyberjaya students concerning the health risks linked to secondhand smoke (SHS). Additionally, it investigated the factors associated with this knowledge and identified sources of information. Furthermore, the study explored the extent of SHS exposure in both living and study environments of the students, along with the resulting effects on physical health and behaviour.

CHAPTER 2
LITERATURE REVIEW
2.1 Level of knowledge regarding SHS

A study done by Gabriel Uche et al, in 2019, regarding knowledge of non-smoker adults about SHS. The aim of this research is to assess the knowledge of exposure to secondhand smoke among non-smoker adults in Eastern Nigeria's community. This study was a cross-sectional descriptive study which involved 500 adult patients at the department of Family Medicine of a tertiary hospital located in

Umuahia, Southeast Nigeria. Exposure to secondhand smoke was defined as exposure to secondhand smoke within one year period. Calculation of percentages for categorical variables are done using Statistical Package for Social Sciences. As for result, 478 out of 500 (95.6%) respondents were aware of the health effects of exposure to secondhand smoke from cigarettes on adults, 464 respondents (92.8%) were aware of the exposure on children, and 326 respondents (65.2%) were aware of the exposure of secondhand smoke to obstetric population. (Gabriel Uche et al, 2019)

Omer Alkan et al, 2022, did research on secondhand smoke exposure for different education levels. The aim of the study is to determine the factors that influence individuals' exposure to tobacco smoke in Turkey according to their education level. Binary logistic regression analysis was used in order to determine the factors associated with individuals' exposure towards tobacco smoke. As for the sampling size, a total of 17084 respondents have been included in the study with everyone aged 15 and over. This study determined that individuals who are unschooled were exposed to tobacco smoke at a rate of 32.61%, primary school graduates at a rate of 34.32%, primary education graduates at a rate of 41.75%, high school graduates at a rate of 41.04% and university graduates at a rate of 40.34%. (Omer Alkan et al, 2022)

Xi Nan et al, 2020 did research which aimed to investigate the prevalence, knowledge and education level associated with secondhand smoke exposure among never- smoking women in Inner Mongolia, Northern China. Study methods used are descriptive analysis and logistic regression. As for sampling, they used a cross- sectional study with multi-stage stratified cluster sampling. A number of 2293 never-smoking women aged 18 and above were included in the study. From the total, 69% of the young women reported that they were exposed to secondhand smoke, 49.9% of young women reported being exposed to secondhand smoke everyday. Based on the study, education level and ethnicity were also significantly associated with secondhand smoke exposure. (Xi Nan et al, 2020)

Xi Nan et al. (2020) conducted a study aiming to examine the prevalence, knowledge, and educational level associated with secondhand smoke exposure among non- smoking women in Inner Mongolia, Northern China. The research employed descriptive analysis and logistic regression methods. Using a cross-sectional study design with multi-stage stratified cluster sampling, a total of 2293 non-smoking women aged 18 and above were included. The findings revealed that 69% of the young women reported exposure to secondhand smoke, with 49.9% reporting daily exposure. Moreover, the study highlighted significant associations between secondhand smoke exposure and factors such as education level and ethnicity. (Xi Nan et al., 2020) Furthermore, Sami H. Alzahrani et al, 2020 did research in Jeddah, Saudi Arabia. The research was aimed to study the knowledge about secondhand smoke risks, as well as their levels of exposure to secondhand smoke and the correlation between knowledge and exposure.

Chi-squared and independent t-test analyses were employed to examine lifestyle factors and exposure to secondhand smoke. There are 416 participants involved in the research. Out of them, 65.0%, 26.4%, and 40.1 % reported having one or more smokers among acquaintances, exposed to secondhand smoke at home, and exposure to secondhand smoke during childhood. 79.8% reported regular exposure to secondhand smoke in public places. There was no observed association between knowledge level and the parameters related to secondhand smoke. (Sami H. Alzahrani, 2020).

2.2 Secondhand smoke exposure and health-related risks

Jun Li et al, 2020 conducted a population-based prospective cohort study in China regarding environmental tobacco smoke exposure and cancer risk . This quantitative study involved 23,415 participants (8388 men, 15,027 women) and 205,515 person- years, starting from 2008 to 2011, in Minhang district, Shanghai, China. The aim of the study is to test hypotheses whether Chinese with

relatively high prevalence of ETSexposure would be at a higher risk of grouped smoking-related cancers, as well as most common smoking-related cancers among Chinese such as cancers of the lung, stomach, colorectum and liver. The study's findings indicated an association between Environmental Tobacco Smoke (ETS) exposure and the risk of all smoking-related cancers, lung cancer and stomach cancer in all participants, but with borderline significance for lung cancer. The strength of associations was the strongest among women who never smoked for lung cancer and stomach cancer. (Jun Li et al, 2020)

A study was done by Hussain Booalayan et al (2020) with the title exposure to environmental tobacco smoke and prevalence of asthma among adolescents in a middle eastern country. This cross-sectional study was done in October 2015 involving 746 consented participants from nine high-schools of Hawally Governorate of Kuwait. The aim is to assess the prevalence of ETS exposure at home, prevalence of asthma and other respiratory conditions among high-school students in Kuwait. It also aims to examine the ETS at home and personal tobacco smoking as the risk factors for self-reported asthma. The data collection was adapted by a previous validated self-administered questionnaire and the result of this research showed that the prevalence of SHS at home and current smoker was 54% and 12.4% respectively. The prevalence of self-reported asthma was 20.5%, physician-diagnosed asthma, wheezing during the last 12 months and wheezing 'ever' was 16.4%, 20.1% and 26.2%, respectively. Hence, being an active or passive smoker is a strong risk factors for self-reported asthma among adolescents. (Hussain Booalayan et al, 2020)

According to Sanni Yaya et al, 2019, environmental tobacco smoking exposure during pregnancy has proven to be associated with increased risk of adverse pregnancy outcomes to the mother and baby such as miscarriage and stillbirth. A population- based cross-sectional study was conducted in Egypt to measure the prevalence of passive smoking and assess its relationship with adverse birth outcomes. The method of this study is that it uses data which were collected from the Egypt Demographic and Health Survey conducted in 2014. 21762 samples were interviewed and after going through propensity score matching technique, the final sample was 5540. The result of the study showed a positive association between SHS and stillbirth among adult women in Egypt. (Sanni Yaya et al, 2019) .To determine the association between sleep problems in children and exposure to secondhand smoke during early life, a population-based cross-sectional study was conducted in China between April 2012 and January 2013. According to Li-Zi Lin et al, 2021, previous studies have revealed that secondhand smoke exposure causes increased risk of simultaneous sleep problemsin children. Hence, this study aims to determine the associations of early-life SHS exposure with sleep issues among childrens. A total of 45562 childrens aged 6-18 years old were recruited from elementary and middle schools in Liaoning Province, China. Participants were assessed via questionnaires where the parents will fill out the questionnaires regarding the early-life SHS exposure (pregnancy and first 2 years of life) and sleep disturbance in children. The Sleep Disturbance Scale for Children (SDSC), a validated tool, was utilized to assess sleep problems and various types of sleep-related symptoms. The result shows 13.5% were exposed to early-life SHS during both pregnancy and the first 2 years of life and there is strong association with higher odds of global sleep problems and different sleep-related symptoms. (Li-Zi Lin et al, 2021)

CHAPTER 3
MATERIALS AND METHODS
3.1 Study design

This was a quantitative cross-sectional study on the level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students.

3.2 Reference population

This cross-sectional study was done among the students in University of Cyberjaya, Malaysia. 365 repondents would make up the sample, and there would be 7000 students in the sample population.

3.3 Study duration

This research was conducted for duration of 12 months starting from 25/09/2023 till 25/09/2024. The expected number of participants is 365 individuals.

3.4 Source population/sample population

University of Cyberjaya students.

3.5 Study participants

i. Inclusion criteria

Students of University of CyberjayaAged more than 18 years old Both males and females are involved Able to understand English and Bahasa Malaysia Able to give informed consent.

ii. Exclusion criteria

Students from other universities who want to or do not want to participate
Students from University of Cyberjaya below 18 and above who is unwilling to join in the study.

3.6 Sample size

$n = N * [Z2 * p * (1-p)e2] / [N-1 + (Z2 * p * (1-p)/e2]$ Where,n= sample size
Z score, z = 1.96 (95% CI)
Margin of error, m = 0.05 (5%) Proportion, p ; sample proportion.

Calculated sample size

The Raosoft Online sample size calculator was used to determine the sample size. 365 responses would make up the sample, and there would be 7000 students in the samplepopulation.
(resourced from the University of Cyberjaya official website), critical value as 1.96 at 95% confidence level, sample proportion at 0.5 to arrive at the largest size possible and margin of error at 0.05.

3.7 Sampling method

i. Convenient sampling

This cross-sectional study was conducted using convenience sampling through an online Google form among students at the University of Cyberjaya in Malaysia who met the inclusion criteria and agreed to participate in the study.

3.8 Data collection, research tool, parameters of interest

i. Method of data collection

A self-administered online questionnaire was adapted from the one utilised in Sae Rom Lee, A-ra Cho, Sang Yeoup Lee, Young Hye Cho, Eun Ju Park, Yun Jin Kim, and Jeong Gyu Lee's 2019 study, Secondhand smoke knowledge, sources of information, and associated factors among hospital staff.
After getting approval from the University of Cyberjaya's Research Ethics Committee(CRERC), project team members will explain the nature and purpose of the study to all interested students. Those who agreed to participate will be asked to provide written informed consent. Google Forms was used to collect data from users of onlineplatforms that were distributed via email and WhatsApp. The pre-tested, closed-endedquestionnaire was given to the volunteered students to complete. With this questionnaire,

included are data on age, gender, ethnicity , and level of knowledge about the health-related risks of secondhand smoke exposure among University of Cyberjaya students.

In order to prevent nonresponse bias and make it simple for students to participate, we provided a brief questionnaire and made it clear that participation in the study is entirely voluntary and that all information will be kept totally private and utilized only for this study. All the information obtained in this study will be kept and handled in a confidential manner , in accordance with applicable laws and regulations. When publishing or presenting the study results , the identity will not be revealed without expressed consent . The data will be collected anonymous, and no personal data would be acquired such as name , IC number , Student ID , or contact information.

Only researchers including students and lecturers who were involved in this study will have access to this study data and it will be destroyed after 5 years of data collection.

ii. Research tool

The online questionnaire will be distributed to be answered among University of Cyberjaya students using online platforms. The questionnaire consists of characteristics of students in University of Cyberjaya, assessment of secondhand smoke exposure consequences and coping strategies , knowledge about secondhand smoke risks and attitude regarding smoking prohibition in public places , sociodemographic and clinical and lifestyle factors associated with knowledge about secondhand smoke risks and association of knowledge with exposure and attitude to secondhand smoke among students of University of Cyberjaya.

iii. Parameters of Interest

A cross-sectional survey was carried out at University of Cyberjaya . All course attendees were chosen to complete the questionnaire individually. Furthermore, online forms and questions was circulated via social media to increase the effectiveness of the study .The study's participants were chosen from each year using random selection techniques. The respondents' sample were drawn using a convenience sampling, in which eligible candidates were chosen at random.

After receiving official authorization from the University of Cyberjaya Research Ethics Committee, a group of skilled data enumerators administered the questionnaire(CRERC). An announcement regarding the study was made in campus the day of the survey.

3.9 Statistical Analysis

The data analysis programme Jeffrey's Amazing Statistical Program (JASP), version 0.16.2, was used to review the data. For continuous variables, descriptive statistics was used to calculate both mean and standard deviation, while for variables, frequency and percentage were used (age, gender, courses, etc).

The level of statistical significance was fixed at 0.05. In this study, a descriptive frequency table was used to summarize the outcome of the level and factors of knowledge about health-related risks of second-hand smoke exposure among University of Cyberjaya students. The data analysis programme Jeffrey's Amazing Statistical Program (JASP), version 0.16.2, was used to analyse the data.

Descriptive statistics (frequency, percentage, mean, and standard deviation) was used to summarise and describe the study population's sociodemographic characteristics. The research population's level of knowledge regarding the health effects of secondhand smoke exposure was investigated using an association test. The Chi Square test was used to determine the influence of two variables on a single dependent variable at the 95% confidence level. A P-value < 0.05 was considered statistically significant.

CHAPTER 4
RESULTS
4.1 Sociodemographic Characteristics of the Respondants

Table 4.1 Sociodemographic Characteristics of the Respondents

Characteristics	Participant	N	%
Age	Range: 18-28 years old	18-21=120	32.35
		22-25=229	61.73
		26-28=22	5.93
Gender	Male	161	43.40
	Female	210	56.60
Marital Status	Married	7	1.89
	Single	364	98.11
Nationality	Malaysian	333	89.76
	Non-Malaysian	38	10.24
Parent's Marital Status	Married	322	86.80
	Divorced	36	9.70
	Widow	13	3.50
Rank in Siblings	Not Eldest	233	63.34
	Eldest	133	36.66
Housing	Own House	141	38.00
	Rental	203	54.72
	Dormitory	27	7.28
Living Modality	Alone	41	11.05
	With Family	158	42.59
	With friends	172	46.36
Academic Year	Year 1	5	1.35
	Year 2	84	22.64
	Year 3	85	22.91
	Year 4	175	47.17
	Year 5	22	5.93
GPA	3.0-4.0	264	71.16
	2.0-3.0	107	28.84

A total of 371 respondents were included in the data analysis for this study. The respondents ranged in age from 18 to 28 years, with 43.40% being male and 56.60% female. Regarding marital status, 98.11% were single and 1.89% were married. Out ofthe 371 respondents, 333 (89.76%) were Malaysian, and 38 (10.24%) were non- Malaysian. The majority of respondents reported their parents were married (86.80%), while 9.70% had divorced parents and 3.50% were widowed. Additionally, 63.34% of the respondents were not the eldest sibling, while 36.66% were the eldest. In terms of housing, 38.00% lived in their own house, 54.72% were renting, and 7.28% resided indormitories. Living arrangements showed that 46.36% lived with friends, 42.59% lived with family, and 11.05% lived alone. The academic year distribution indicated that 47.17% of respondents were in their fourth year, followed by 22.91% in their third year, 22.64% in their second year, 5.93% in their fifth year, and 1.35% in their first year. Regarding GPA, 71.16% of respondents had a GPA between 3.0 and 4.0, while 28.84% had a GPA between 2.0 and 3.0.

4.2   Objective 1 : To identify the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students

Table 4.2 indicates that 70.35 % of the students in University of Cyberjaya had adequate knowledge while 29.65 % had inadequate knowledge towards health-related risks of secondhand smoke exposure. The level of knowledge is categorised as 1 to 4 as inadequate, meanwhile 5 to 8 as adequate by taking the median as the cut-off point. This was based on the total sample of diseases where the respondents need to select.

Table 4.2 : Level of Knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students, N=371

| | Level of knowledge | |
Variables	Adequate, N (%)	Inadequate, N (%)
Level of Knowledge among University of Cyberjaya students	261 (70.35)	110 (29.65)

Note: data above were analyzed by using descriptive test

Table 4.2 presents the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students. According to the table, 70.35% of the students had adequate knowledge, while 29.65% had inadequate knowledge. This data, analyzed using a descriptive test, highlights a significant portion of students who are well-informed about the dangers of SHS exposure.

Objective 2 : To associate between smoking status and level of knowledge towards health-related risks of secondhand smoke exposure in University of Cyberjaya students.

Table 4.3 : Association between smoking status with level of knowledge, N=371 Level of knowledge

	Adequate, N (%)	Inadequate, N (%)	Chi Square, X^2	df	p-value
Smoker	17 (4.58)	11(2.97)	2.33	2	0.31
Non-smoker	237 (63.88)	94(25.34)			
Quitter > 6m	7(1.89)	5(1.35)			

*Chi-square test, P value <0.05 is considered significant

The Chi-square value (X^2) , as indicated by Table 4.3, is 2.33, indicating a lower value than the critical (X^2)value at the second degree of freedom at the 5% significant level (X^2 2,0.05 = 5.991). In addition, the p-value is 0.31, which is more than 0.05 . This demonstrates that there is no significant association between the smoking status and the level of knowledge about the health risks of secondhand smoke. Consequently, we can say that the null hypothesis is true and that there is no correlation between a

person's smoking status and their level of knowledge about the health risks associated with secondhand smoke.

4.5 Objective 3 : To correlate sociodemographic factors with level of knowledge about health-related risks of secondhand smoke exposure amongUniversity of Cyberjaya students

Table 4.4 : Association between age and level of knowledge about health-related risks of SHS exposure among University of Cyberjaya students N=371

	Adequate, N (%)	Inadequate, N (%)	Chi Square, X^2	df	p-value
Age (18-21)	76(20.49)	44(11.86)	4.33	2	0.12
Age (22-25)	168(45.28)	61(16.44)			
Age (26-28)	17(4.58)	5(1.35)			

*Chi-square test, P value <0.05 is considered significant

The Chi-square value (X^2) is 4.334 , indicating a lower value than the critical (X^2) value at the second degree of freedom at the 5% significant level (X^2 2,0.05 = 5.991). In addition, the p-value is 0.12, which is more than 0.05 . This demonstrates that thereis no significant association between the age and the level of knowledge about the health risks of SHS. Consequently, we can say that the null hypothesis is true and thatthere is no correlation between a person's age and their level of knowledge about the health risks associated with secondhand smoke exposure.

Table 4.5: Association between gender and level of knowledge about health-relatedrisks of SHS exposure among University of Cyberjaya students , N=371

	Level of knowledge		Chi Square, X^2	df	p-value
	Adequate, N (%)	Inadequate, N (%)			
Male	109(29.38)	52(14.02)	0.96	1	0.33
Female	152(40.97)	58 (15.63)			

*Chi-square test, P value <0.05 is considered significant

The Chi-square value (X^2), as indicated by Table 4.5, is 0.96, indicating a lower value than the critical (X^2) value at the second degree of freedom at the 5% significant level(X^2 1,0.05 = 3.841). In addition, the p-value is 0.33, which is more than 0.05 . This demonstrates that there is no significant association between the gender and the level of knowledge about the health risks of secondhand smoke. Consequently, we can say that the null hypothesis is true and that there is no correlation between gender and their level of knowledge about the health risks associated with secondhand smoke exposure.

Table 4.6 : Association between marital status and level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students ,N=371

| | Level of knowledge | | | | |
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X^2	df	p-value
Married	4 (1.08)	3(0.81)	0.60	1	0.44
Single	257(69.27)	107(28.84)			

*Chi-square test, P value <0.05 is considered significant

The Chi-square value (X^2), as indicated by Table 4.6, is 0.60, indicating a lower value than the critical (X^2) value at the second degree of freedom at the 5% significant level (X^2 1,0.05 = 3.841). In addition, the p-value is 0.44, which is more than 0.05 . This demonstrates that there is no significant association between the marital status and the level of knowledge about the health risks of secondhand smoke. Consequently, we can say that the null hypothesis is true and that there is no correlation between marital status and their level of knowledge about the health risks associated with secondhand smoke.

Table 4.7 : Association between nationality and level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students ,N=371

| | Level of knowledge | | | | |
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X^2	df	p-value
Malaysian	228 (61.46)	105(28.30)	5.52	1	0.02
Non-Malaysian	33(8.90)	5(1.35)			

The Chi-square value (X^2), as indicated by Table 4.7, is 5.52, indicating a lower value than the critical (X^2) value at the second degree of freedom at the 5% significant level (X^2 1,0.05 = 3.841). In addition, the p-value is 0.02, which is below 0.05 . This demonstrates that there is a significant association between the nationality and the level of knowledge about the health risks of secondhand smoke. Consequently, we can say that the null hypothesis is true and that there is no correlation between nationality and their level of knowledge about the health risks associated with secondhand smoke.

Table 4.8: Association between parents' marital status and level of knowledge abouthealth-related risks of secondhand smoke exposure among University of Cyberjaya students, N=371.

| | Level of knowledge | | | | |
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X2	df	p-value
Married	228 (61.46)	94 (25.34)	0.53	2	0.77
Divorce	25 (6.74)	11 (2.97)			
Widow	8 (2.16)	5 (1.35)			

*Chi-square test, P value <0.05 is considered significant

Table 4.8 shows that the Chi-square value (X2) is 0.53, which is lower than the critical(X2) value with 2 degrees of freedom at 5% level of significance (X2 2,0.05 = 5.991). Besides that, the p value is 0.77 which is higher than 0.05 (p > 0.05). This shows that the association between parents' marital status (married, divorced, widowed) and level of knowledge about health-related risks of second-hand smoke (adequate, inadequate) is insignificant. Therefore, we can conclude that we accept null hypothesis and there isno association between parents' marital status and level of knowledge about health- related risks of secondhand smoke.

Table 4.9: Association between rank in siblings and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

	Level of knowledge				
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X2	df	p-value
Not Eldest	165 (44.47)	70 (18.87)	0.01	1	0.94
Eldest	96 (25.88)	40 (10.78)			

*Chi-square test, P value <0.05 is considered significant

Table 4.9 shows that the Chi-square value (X2) is 0.01, which is lower than the critical(X2) value with 1 degrees of freedom at 5% level of significance (X2 1,0.05 = 3.841). Besides that, the p value is 0.94 which is higher than 0.05 (p > 0.05). This shows that the association between rank in siblings (eldest, non-eldest) and level of knowledge about health-related risks of second-hand smoke (adequate, inadequate) is insignificant. Therefore, we can conclude that we accept null hypothesis and there is no association between rank in siblings and level of knowledge about health-related risks of secondhand smoke.

Table 4.10: Association between monthly family income and level of knowledgeabout health-related risks of secondhand smoke exposure among University of Cyberjaya students. N = 371

	Level of knowledge				
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X2	df	p-value
< 1000	23 (6.20)	10 (2.70)	1.44	3	0.70
1000 - 3000	121 (32.62)	44 (11.86)			
3000 - 10000	32 (8.63)	14 (3.77)			
> 10000	85 (22.91)	42 (11.32)			

*Chi-square test, P value <0.05 is considered significant

Table 4.10 shows that the Chi-square value (X2) is 1.44, which is lower than the critical (X2) value with 3 degrees of freedom at 5% level of significance (X2 3,0.05 = 7.815). Besides that, the p value is 0.70 which is higher than 0.05 (p > 0.05). This shows that the association between monthly family income (<1000, 1000-3000, 3000-10000, >10000) and level of knowledge about health-related risks of second-hand smoke (adequate, inadequate) is insignificant. Therefore, we can conclude that we accept null hypothesis and there is no association between monthly family income and

Table 4.11: Association between residency and level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students.

	Level of knowledge				
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X2	df	p-value
Cyberjaya	128 (34.50)	39 (10.51)	5.77	1	0.02
Others	133 (35.85)	71 (19.14)			

*Chi-square test, P value <0.05 is considered significant

Table 4.11 illustrates the relationship between residency and the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students. The Chi-square value (X²) of 5.77, with 1 degree of freedom, falls above the critical value of 3.841 at the 5% significance level. Additionally, the p-value of 0.02 is less than 0.05, indicating statistical significance. These findings suggest a significant association between residency locations (Cyberjaya and others) and the level of knowledge regarding secondhand smoke risks. Consequently, we reject the null hypothesis, concluding that residency plays a role in shaping awareness of health- related risks associated with secondhand smoke among University of Cyberjaya students.

Table 4.12 : Association between housing and level of knowledge about health relatedrisks of secondhand smoke exposure among University of Cyberjaya students , N = 371

	Level of knowledge				
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X2	df	p-value
Own house	94 (25.34)	47 (12.67)	7.80	2	0.02
Rental	153 (41.24)	50 (13.48)			
Dormitory	14 (3.77)	13 (3.50)			

*Chi-square test, P value <0.05 is considered significant

Table 4.12 shows that the Chi-square value (X²) is 7.80, which is higher than the critical Chi-square value with 2 degrees of freedom at the 5% level of significance (X2 2,0.05 = 5.991) . Additionally, the p-value is 0.02, which is less than 0.05 (p < 0.05). This indicates that the association between housing

type (own house, rental, dormitory) and the level of knowledge about health-related risks of secondhand smokeexposure (adequate, inadequate) is statistically significant. Therefore, we reject the null hypothesis and conclude that there is an association between housing type and thelevel of knowledge about health-related risks of secondhand smoke.

Table 4.13 : Association between living modality and level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students , N = 371

	Level of knowledge		Chi Square, X2	df	p-value
	Adequate, N (%)	Inadequate, N (%)			
Alone	28 (7.55)	13 (3.50)	1.90	2	0.39
With family	106 (28.57)	52 (14.02)			
With friends	127 (34.23)	45 (12.13)			

*Chi-square test, P value <0.05 is considered significant

Table 4.13 examines the association between living modality and the level of knowledge about health-related risks of secondhand smoke exposure among 371 University of Cyberjaya students. The Chi-square value is 1.90, which is not higher than the critical Chi-square value with 2 degrees of freedom at the 5% level of significance. Additionally, the p-value is 0.39, which is greater than 0.05 (p > 0.05). This indicates that there is no statistically significant association between living modality (alone, with family, with friends) and the level of knowledge about health- related risks of secondhand smoke exposure. Therefore, we do not reject the null hypothesis and conclude that there is no significant association between living modality and the level of knowledge about health-related risks of secondhand smoke.

Table 4.14 : Association between academic year and level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students ,

	Level of knowledge		Chi Square, X2	df	p-value
	Adequate, N (%)	Inadequate, N (%)			
Year 1	5 (1.35)	0			
Year 2	47 (12.67)	37 (9.97)			
Year 3	57 (15.36)	28 (7.55)	24.03	4	<0.01
Year 4	141 (38.00)	34 (9.16)			
Year 5	11 (2.97)	11 (2.97)			

*Chi-square test, P value <0.05 is considered significant

In Table 4.14, a significant association is observed between academic year and the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students. The Chi-square value (X^2) of 24.03 exceeds the critical value with 4 degrees of freedom at the 5% level of significance ($X^2_4, 0.05 = 9.488$). Additionally, the p-value is <0.01, indicating statistical significance. This shows that the association between academic year (year 1,2,3,4 and 5) and level of knowledge about health-related risks of secondhand smoke (adequate, inadequate) is significant. Therefore, we reject the null hypothesis and conclude that there is a significant association between academic year and the level of knowledge about theserisks.

Table 4.15 : Association between GPA and level of knowledge about health-relatedrisks of secondhand smoke exposure among University of Cyberjaya students, N = 371

	Level of knowledge				
	Adequate, N (%)	Inadequate, N (%)	Chi Square, X^2	df	p-value
3.0 – 4.0	193 (52.02)	71 (19.14)	3.332	1	0.068
2.0 – 3.0	68 (18.33)	39 (10.51)			

*Chi-square test, P value <0.05 is considered significant

Table 4.15 presents the association between GPA and the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students. The Chi-square value (X^2) of 3.332 falls below the critical value with 1 degree of freedom at the 5% level of significance ($X^2_1, 0.05 = 3.841$). Additionally, the p-value of 0.068 exceeds the significance threshold of 0.05. These results indicate thatthe association between GPA ranges (2.0 – 3.0 and 3.0 – 4.0) and the level of knowledge about secondhand smoke risks is not statistically significant. Therefore, we accept the null hypothesis, concluding that there is no significant association between/GPA and the level of knowledge about health-related risks of secondhand smokeamong the University of Cyberjaya students.

CHAPTER 5
DISCUSSION
5.1 To Identify Level of Knowledge about Health-related Risks of Secondhand Smoke Exposure among University of Cyberjaya students.

In this study, more than two-thirds of the University of Cyberjaya students have adequate knowledge regarding health-related risks of secondhand smoke exposure. Out of 371 respondents, 70.35% have adequate knowledge, and 29.65% have inadequate knowledge. The categorization of adequate and inadequate knowledge wasdetermined by a questionnaire where respondents needed to identify diseases caused by SHS exposure from a given list. The diseases listed included Lung Cancer, Heart Diseases, Cognitive Deficit, Low Birthweight, Ear Infection in Children, Heart Attack in Children, Allergies in Children, and Asthma in Children. Respondents could select multiple answers. This might be due to the effective health education programs on campus, as the University of Cyberjaya is well-known for its

focus on health sciences and medical education. Additionally, students have access to a wealth of information through the internet, libraries, and academic resources, which can help them learn about the risks of secondhand smoke exposure. However, a lack of awareness or interest among a minority of students may result in inadequate engagement in university activities, leading to insufficient knowledge. According to Sami H. Alzahrani (2020), their findings also showed that more than half of the medical students in Saudi medical colleges had adequate knowledge regarding SHS risks.

Similar result was found by Bisyara Nur Ain Mohd Kamaruzaman et.al (2021) where she highlighted similar findings from various other research.

Al-Haqwi (2009) reported that the majority of students at two medical colleges in Riyadh agreed that smoking causes serious illness. Similarly, a study by Nguyen (2020) in Vietnam found that most students acknowledged the serious health risks of smoking. The GATS Malaysia 2011 survey showed that 92.2% of Malaysian adults believed smoking causes serious illness. These studies, conducted among university students, suggest that higher education levels may contribute to increased awareness of smoking's harmful effects. Additionally, Al-Naggar's research on Malaysian university students revealed that about 66.4% of non-smokers and nearly 50% of smokers recognized that cigarettes contain over 40 carcinogens. The same study also showed that 76.5% of smokers and 90.0% of non-smokers were aware that exposure to cigarette smoke can lead to miscarriage. In contrast, a study done by Yue Jin et al. (2014) revealed that more than half of the population demonstrated limited awareness of the harmful effects of smoking (56.8%) and secondhand smoke (SHS) exposure (51.5%). Additionally, approximately 24.6% were well-informed about the risks associated with SHS exposure. This discrepancy in findings might be due to differences in research methodologies, sample populations, or the effectiveness of health education programs in different regions.

5.2 To asssociate between smoking status and level of knowlegde towards health- related risks of secondhand smoke exposure in University of Cyberjaya students.

The respondents are divided into 3 categories which are smokers, non-smokers and quitters more than 6 months . Only 28 people of the respondents were smokers and 4.58 % have adequate knowledge regarding the health-related risks of secondhand smoke exposure while 2.97 % have inadequate knowledge. This shows that despite being a smoker with knowledge of health-related risks , respondents still choose to smoke as they rely on it for various factors such as stress relievers , addiction , negative moods , peer pressure or pleasure. However , a previous study showed significant relationship between smoking and secondhand smoke awareness (Yong Kang Cheah ,2018). On the other hand , there are some smokers with inadequate knowledge where understanding the harmful components of a cigarette is less. Hence ,this impacts their informed decision-making ability. A total of 331 respondents were non-smokers which contributed to 89.22% of the respondents. Two third of the non- smokers (63.88 %) had adequate knowledge while (25.34 %) had inadequate knowledge. This data shows that most of the respondents are well equipped with the knowledge of smoke exposure. Respondents are more aware of the perils of smoking and are unsurprised by the health risks findings. The remaining 25.38% have inadequate knowledge and do not have enough in-depth information regarding health risks from secondhand smoke exposure. The last group of respondents were the quitters which covered 3.24% of the respondents . 1.89 % had adequate knowledge while 1.35 % did not. The percentage of respondents with adequate knowledge is higher, which explains the reason they have quit smoking . More efforts from the government , NGOs ,community , private agencies , mass media , and individuals should be implemented to fight smoking which also leads to secondhand smoke exposure. Campaigns , law enforcement,and special programmes should be initiated as strategic plans for the control of smoking

and secondhand smoke exposure. Regardless of smoking status , the current generation has enough exposure and capability to obtain the health-related risks of secondhand smoke expsoure.

Therefore, the null hypothesis of this research is accepted where there is no association between a person's smoking status and their level of knowledge about health-related risks associated with secondhand smoke.

5.3 To correlate sociodemographic factors with level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students

(A) Association of age and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

The respondents were grouped into 3 classes which is 18 – 21, 22 – 25, and 26 – 28. The first group of respondents aged 18 – 21 covered 32.35 % of the respondents in which 20.49 % had adequate knowledge and 11.86 % had inadequate knowledge.

Due to their increased concern for the health and safety of their younger adolescents, parents exercise more control over their movements, reducing their exposure to health dangers such secondhand smoke exposure, which may also contribute to the respondents' lack of comprehension. The second group of respondents aged 22 – 26 were the majority of the respondents ,61.73 % in which 45.28 % had adequate knowledge and 16.44 % had inadequate knowledge.

Notably, people between the ages of 22 and 25 are more likely to smoke although they are more aware of the negative effects of secondhand smoke than people over the age of 26. This suggests youngsters ought to be a priority in any program aimed at decreasing the prevalence of smoking. Given their higher level of maturity, older adolescents may be given more freedom by their parents. They are therefore more able to travel and a mobile. like coffee shops and bistros without air conditioning, where smoking is common, which may increase their risk of being exposed to secondhand smoke. The third group of respondents aged 26 – 28 were the least number of the respondents, which were only 5.93 %. 4.58 % had adequate knowledge and 1.35 % had inadequate knowledge. This results can be explained by the fact that elderly people have a lower knowledge than younger people as a result of a lack of previous educational chances (Yong Kang Cheah,2018). As a result, in general, older adults struggle to grasp the detrimental effects of smoking on nonsmokers. More health education programmes for elderly individuals are likely to increase their knowledge of smoking. Therefore, the null hypothesis of this research is accepted where there is no association between age and their level of knowledge about health- related risks associated with secondhand smoke.

(B) Association of gender and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

Males and females were the respondents who were involved in the study. 43.40 % of the respondents were male and 56.60 % were females. 29.38% of the male respondents had adequate knowledge while 14.02 % had inadequate knowledge.

40.97 % of the female respondents had adequate knowledge while 15.63% did not have adequate knowledge. Notably, there is no discernible difference in the knowledge of secondhand smoke between the sexes, even though males smoke more often than women. This suggests that although men and women are equally aware of the dangers of secondhand smoking, males have a greater propensity to smoke cigarettes. Consequently, it might be said that men smoke for reasons other than being mindful of secondhand smoke. Regardless of smoking status, male respondents had a significant level of exposure to SHS. These results contrast with those of a US study that discovered that teenage girls were more

susceptible to SHS exposure (AgakuIt ,2009) and with a different Malaysian investigation that found no correlation between gender and SHS exposure (Lim HL , 2018). If the goal of lowering smoking among men is to be achieved, this study suggests that policy makers should prioritize the introduction of intervention strategies that can effectively reduce smoking among males rather than raising public knowledge of secondhand smoke. Therefore, the null hypothesis of this research is accepted where there is no association between gender and their level of knowledge about health-related risks associated with secondhand smoke.

(C) Association of marital status and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

Two classes of marital status were the respondents in this study . 98.11% of the respondents were single and only 1.88% were married. Two third of the single respondents (69.27 %) have adequate knowledge while 28.84 % of the single respondents have inadequate knowledge. 1.08% of the married respondents have adequate knowledge and 0.81 % of the single respondents have inadequate knowledge.There have been no studies indicating a correlation between marital status and level of knowledge about health-related risks of secondhand smoke exposure.

Students who are widowed or divorced are more likely to smoke than those who are married or single. (Bisyara Nur Ain Mohd Kamaruzaman, 2021). Furthermore , the health risks of secondhand smoke exposure could be classified as a self-learning subject and is not affected by marital status.As a result , the null hypothesis of this research is accepted where there is no association between marital status and their level of knowledge about health-related risks associated with secondhand smoke.

(D) Association of nationality and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

Malaysians and non-Malaysians were the respondents that were categorized in this research. A total of 89.76 % were Malaysians and 10.24 % were non-Malaysians. 61.46% of Malaysians had adequate knowledge while 28.30 % had inadequate knowledge. 8.90 % of the non-Malaysians had adequate knowledge while 1.35% had inadequate knowledge.The efforts and knowledge taken by each country to educate their residents is influeced by many factors such as economy , culture , beliefs, quality of education , laws & enforcements of smoking , media , NGOs , healthcare professionals , and many more . The way strategies are being implemented in each country differs resulting in differents levels of knowledge among respondents .

Hence , this could be the reason nationality plays a role in the knowledge level regarding health risks . This conclusion is further corroborated by the fact that, in comparison to other medical schools in the country, students in Jeddah, Saudi Arabia, have comparatively little awareness of the health hazards associated with SHS exposure (Sami H Alzahrani , 2020). There is a significant association between the nationality and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

(E) Association of parent's marital status and level of knowledge about health- related risks of secondhand smoke exposure among University of Cyberjaya students.

The participants were categorized into three distinct groups: married, divorced, and widowed. According to the findings, the majority, comprising 86.80%, were married, with 61.46% demonstrating adequate knowledge and 25.34% exhibiting inadequate knowledge. Among the respondents, 9.70% were divorced, with 6.74% possessing adequate knowledge and 2.97% lacking it. In the widow category,

2.16% showed adequate knowledge, while 1.35% did not.

These results align with previous studies highlighting the pivotal role of parental awareness in mitigating children's exposure to secondhand smoke. For example, research conducted in Malaysia by Siti Mariana Anis Saberi (2021) revealed that parental and peer smoking notably heightened the likelihood of secondhand smoke exposure among university students. Although direct research on the correlation between parents' marital status and their awareness of health-related risks associated with secondhand smoke exposure is lacking, our study accepts the null hypothesis, indicating no significant link between parents' marital status and their level of knowledge regarding these risks among University of Cyberjaya students. This lack of association might be explained by the fact that knowledge about secondhand smoke risks is likely influenced more by educational programs, public health campaigns, and individual interest rather than by parental marital status. Studies have shown that higher education levels and access to information play crucial roles in increasing awareness of smoking's harmful effects (Al-Haqwi, 2009; Nguyen, 2020; GATS Malaysia, 2011). Consequently, the differences in knowledge levels are more plausibly attributed to these factors rather than to the marital status of parents.

Therefore, we accept the null hypothesis, indicating no significant link between parents' marital status and their level of knowledge regarding these risks among University of Cyberjaya students.

(F) Association of rank in siblings and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

The respondents were categorized into two groups which are the eldest and non- eldest. According to the results obtained from a total of 371 respondents, 235 fell into the non-eldest category, while 136 were identified as eldest. In the non-eldest group, out of 100% total of 371 respondents, 44.47% exhibited adequate knowledge, whereas 18.87% demonstrated inadequate knowledge regarding health-related risks associated with SHS exposure. In contrast, from 371 respondents, 25.88% belongs to eldest category which displayed adequate knowledge, while remaining eldest which is 10.78%, lacked it. These findings indicate that non-eldest individuals have a higher percentage of adequate knowledge regarding the health-related risks of secondhand smoke exposure. Though limited research exists on the association between sibling rank and knowledge about the health risks of secondhand smoke exposure, it is plausible that parents become increasingly aware of the dangers of secondhand smoke with subsequent children. This heightened awareness may contribute to the observed difference in knowledge levels among siblings. Additionally, a study conducted in Saudi Arabia by Abdulmohsen H. Al-Zalabani highlighted parental smoking and the smoking habits of close friends as significant factors associated with secondhand smoke exposure among intermediate and secondary school students (Al-Zalabani, 2015). However, our study found no association between sibling rank and the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

(G) Association of monthly family income and level of knowledge about health- related risks of second-hand smoke exposure among University of Cyberjaya students.

In this study, monthly family incomes were divided into four categories which are less than 1000, 1000-3000, 3000-10000, and more than 10000. Among the 371 respondents, the majority fell into the 1000-3000 monthly family income bracket, with 32.62% demonstrating adequate knowledge and 11.86% lacking adequate knowledge. The second highest category was monthly family income exceeding 10000, where 22.91% possessed adequate knowledge and 11.32% lacked it. The category with the fewest respondents was less than 1000 monthly family income, with 6.2% demonstrating adequate knowledge and 2.70% lacking it. This was followed by the 3000-10000 monthly family income category, where

8.63% demonstrated adequate knowledge and 3.77% lacked it. The result of this study is in contrary with an article by Sami H. Alzahrani found that monthly family income was significantly linked to knowledge about the risks of secondhand smoke (Alzahrani, 2020). In is also in contrary to a research conducted by Abdulmohsen H. Al-Zalabani revealed that participants with monthly family incomes of less than 3000 SAR had lower levels of knowledge about secondhand smoke risks compared to those with higher incomes (Al-Zalabani, 2015). Althought the result of the previous study does not align with the current study's results, it shows that the lowest number of respondents with adequate knowledge belonged to the less than 1000 monthly family income category. The lack of significant association between monthly family income and knowledge about secondhand smoke (SHS) exposure risks in this study may be attributed to various factors. It's possible that other socioeconomic variables, such as education level or occupation, could have influenced respondents' awareness of SHS dangers more prominently than income alone. Additionally, cultural and environmental factors specific to the study population, such as access to health education resources or prevailing attitudes towards smoking, may have mitigated the influence of income on knowledge levels. Furthermore, the relatively small sample size of the study might have limited the statistical power to detect subtle associations between income and knowledge about SHS risks. These factors collectively highlight the complexity of the relationship between socioeconomic status and health knowledge, underscoring the need for further research to better understand the nuanced dynamics at play.

Therefore, the result of this study indicates no association between monthly family income and the level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

(H)Association of residence and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

In this study, residency is divided into two categories: respondents who live in Cyberjaya and those who reside elsewhere. Among the 371 respondents, the majority live outside Cyberjaya, with 35.85% demonstrating adequate knowledge and 19.14% lacking it. Conversely, 34.5% of respondents reside in Cyberjaya with adequate knowledge, while 10.51% of them lack adequate knowledge. Despite previous research findings, such as those by Ali H. Ziyab, which suggest that socioeconomic factors, including residency, are associated with second-hand smoke exposure (Ali H.Ziyab et.Al, 2024), this study did not find a significant association between residency and the level of knowledge about health-related risks of second-hand smoke exposure among University of Cyberjaya students. Possible reasons for this lack of association could include the complexity of factors influencing knowledge levels, the specific context of the study population, and the interplay of various socioeconomic variables beyond just residency. nother possible reason for the lack of association between residency and knowledge about health-related risks of second-hand smoke exposure among University of Cyberjaya students could be the homogeneity of health education efforts across different residential areas. It's plausible that educational campaigns, health policies, or public health interventions targeting awareness about second-hand smoke risks are implemented uniformly across the region, regardless of residency. If such efforts are consistent and widespread, they could lead to similar levels of knowledge among students irrespective of their place of residence. Additionally, individual factors such as personal interest in health-related topics, access to information through media and internet, or exposure to educational materials outside of the immediate residential environment could also contribute to a more uniform distribution of knowledge levels across different residential areas.

Association of housing and level of knowledge about health-related risks of secondhand smoke exposure

among University of Cyberjaya students.

The study examined the association between housing type and the level of knowledge about health-related risks of secondhand smoke (SHS) exposure among 371 University of Cyberjaya students. The results indicated a significant association, with students living in their own houses showed the highest level of adequate knowledge at 25.34%, followed by those in rental accommodations at 41.24%. In contrast, students living in dormitories had the lowest level of adequate knowledge at 3.77%. These findings suggest that housing type significantly influences students' knowledge about the risks of SHS, with those in dormitories being less informed. The results also highlight variations in knowledge adequacy across different living arrangements.

Individuals living in their own houses had the highest percentage of adequate knowledge about SHS exposure, likely due to greater control over their environment and a stronger sense of personal responsibility. Conversely, those living in dormitories had the lowest percentage of adequate knowledge, possibly due to limited control over their living environment and less personal responsibility. Rental properties often have stricter rules and regulations regarding smoking, which may lead to increased awareness among tenants about SHS exposure. This result is consistent with a study by Ghodsi et al. (2019), which found that students living in dormitories were more likely to smoke and had less knowledge about SHS exposure. Similarly, a study conducted by Noordin et al. (2023) found that students living in dormitories were more likely to be exposed to SHS due to the shared living environment and the presence of smoking peers. The influence of peers to smoke is often greater than the likelihood of students gaining knowledge about SHS exposure. This can lead to a lower level of knowledge about SHS exposure among students living in dormitories.

These findings collectively support the conclusion that housing type is an important factor influencing students' knowledge about the health-related risks of secondhand smoke exposure.

(I) Association of living modality and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

In this study, respondents were classified into three distinct living modalities: living alone, with family, or with friends. Among those who live alone, 7.55% possess adequate knowledge out of the total sample of 371 respondents, while 3.50% have inadequate knowledge. For respondents residing with family, 28.57% demonstrate sufficient knowledge, compared to 14.02% who do not, out of the total sample size. Interestingly, among individuals living with friends, 34.23% exhibit adequate knowledge, whereas 12.13% lack it, based on the total sample size of 371 respondents. However, despite these variations, the results do not show a significant association between living modality and the level of knowledge about health-related risks of secondhand smoke exposure. It's important to note that a study conducted by Al-Momen et al. (2013) in Saudi Arabia found an association between living with friends and knowledge levels about SHS risks. The discrepancies between their findings and those of this study could potentially be attributed to differences in demographic characteristics, cultural contexts, or tobacco control policies between the two study locations that influence knowledge acquisition and dissemination.

Additionally, in a family home setting, exposure to secondhand smoke (SHS) due to parental smoking is often unavoidable. The expansion of smoke-free zones in Malaysia, under the updated Tobacco Product Regulation 2004, has led to an increase in parental smoking at home. This frequent exposure to SHS can adversely affect those who are exposed. Siti Mariana Anis binti Saberi et al. (2023) suggest that individuals living with family members or friends are likely to have more knowledge about SHS exposure, as they are frequently exposed to smoke. This reinforces the notion that living environments can impact awareness and understanding of health- related risks associated with SHS exposure, although

the specific modalities in this study did not show a significant statistical association. The contrasting findings between our study and previous research by Al-Momen et al. (2013) and Siti Mariana Anis binti Saberi et al. (2023) regarding the association between living environments and knowledge levels about secondhand smoke exposure may be attributed to contextual differences, methodological variations, and sample size considerations.

Factors such as cultural norms, socioeconomic status, and temporal trends in tobacco control policies could have influenced the observed associations differently across studies.

(J) Association of academic year and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

In this study, the result indicates a significant association between academic year and the level of knowledge regarding health-related risks associated with secondhand smoke (SHS) exposure among University of Cyberjaya students. Notably, seniors demonstrated the highest proportion of adequate knowledge at 40.97% comprising of year 4 and year 5, followed by Year 3 students at 15.36%. In contrast, Year 1 students exhibited the lowest level of adequate knowledge at 1.35% . One plausible explanation for this finding is that students in higher academic years or semesters, particularly seniors, may have had greater exposure to health education programs, research studies, and public health campaigns focused on smoking and SHS. With more time spent in their academic journey, seniors likely encountered a broader range of educational opportunities and resources aimed at promoting awareness of the risks and consequences associated with smoking and SHS exposure. This increased exposure could contribute to the higher levels of knowledge observed among senior students in our study. A study conducted by Siwen Sun et. Al. (2023) mentioned that there were four findings from four different studies (Elsborg et al., 2017; Rababah et al., 2019; Zhang et al., 2016; Zou et al., 2018), consistently demonstrate that as the number of semesters for health students increases, so does their level of health literacy. These results support the notion that, alongside personal motivation, the curriculum plays a significant role in the acquisition of skills and knowledge related to one's health. Higher semesters correlate with increased knowledge acquisition, suggesting that students in later semesters possess greater medical expertise and proficiency in accessing quality health information (Elsborg et al., 2017; Zhang et al., 2016; Zou et al., 2018). Based on World Health Organisation, health literacy is defined as Health literacy encompasses the capacity of individuals to "access, comprehend, and utilize information effectively to enhance and sustain good health.

Therefore, these previous research shows there is a positive correlation between higher academic year/semester and increased health literacy among university students, which justifies the result of this study that senior students demonstrate greater knowledge and understanding of health-related topics, including the risks associated with secondhand smoke exposure.

(K) Association of GPA and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students.

The result of this study revealed that there is no association between GPA and level of knowledge about health-related risks of secondhand smoke exposure among University of Cyberjaya students. Among those with GPAs between 3.0 and 4.0, 52.02% demonstrated adequate knowledge, while 19.14% exhibited inadequate knowledge. Similarly, for students with GPAs between 2.0 and 3.0, 18.33% had adequate knowledge compared to 10.51% with inadequate knowledge. The result of our study aligns with the findings of previous research done by Sami H. Alzahrani (2020) indicating a similar lack of correlation between academic performance and knowledge about health-related risks of secondhand

smoke exposure. These findings suggest that GPA alone may not reliably reflect students' knowledge of SHS risks.

Possible reasons for this could include varying sources of information about SHS that are not linked to academic achievement, such as social media, peer discussions, or extracurricular activities. Additionally, students from different academic disciplines might have differing levels of exposure to health-related education, regardless of theirGPA, as this research does not specify the acadmeic background / faculty of the respondant. While GPA reflects a student's academic performance across various subjects, it does not specifically measure their knowledge or awareness of health- related topics. As one study points out, "Among the many issues raised are that, first, test score is only one measure and testing is only one means to judging learners' competencies. Learners may have qualities or skills that may not be quantifiable or identified through testing measures." This highlights that exams and test scores, which heavily influence GPA, are not a complete representation of a student's knowledge and abilities. Tang Wee Teo (2018). Knowledge is a distinct concept that is influenced by various factors beyond academic performance. This underscores the need for targeted health education programs that reach all students, irrespective oftheir academic performance.

CHAPTER 6
LIMITATION, CONCLUSION AND RECCOMENDATION
6.1 Limitation
The study had significant drawbacks. Due to the fact that SHS exposure was self- reported and not verified by a salivary or serum cotinine test, memories of SHS exposure was not be perfect. Furthermore, as all of the data is self-reported, reporting errors may occur. Certain information, like marital status and smoking habits, is prone to be reported fraudulently, which could result in figures that are incorrect. Third, because it does not determine the level of awareness, posing a single question to determine respondents' awareness of the effects of secondhand smoke may not be sufficient. The limited sample size is not representative of all University of Cyberjaya students. The majority of participants live in Cyberjaya, and there is also a variation between local and foreign students, which could have an impact on the results pertaining to sociodemographic variables. More benefit time would of time would have been an advantage for a more extensive, complete and in-depth research.

6.2 Conclusion
In conclusion, the majority of University of Cyberjaya students possess adequate knowledge about the health risks of secondhand smoke exposure, likely due to effective health education programs and readily available information resources. However, smoking status does not significantly correlate with knowledge levels, indicating that awareness alone may not deter smoking action. Furthermore, while knowledge levels are consistent across most sociodemographic factors, significant variations exist based on nationality, housing, residency, and academic year, suggesting the need for targeted interventions to address these disparities and enhanceoverall awareness.

6.3 Recommendation
The gap between adequate and inadequate knowledge among respondents is moderate.It is recommended more educational activities are needed to improve respondents knowledge of health-related risks of secondhand smoke exposure . Subsequent research should look into the possibility of enacting laws prohibiting parents or guardians who smoke from exposing their children to secondhand smoke.

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