

# KNOWLEDGE ON SMOKING/VAPING, ATTITUDE TOWARDS SMOKING BEHAVIOR, AND PRACTICE OF SMOKING PREVENTION AND CESSATION AMONG NURSING STUDENTS

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**Abstract:** *Cigarette smoking is a major global public health concern with over 8 million premature deaths from smoking each year. As young adults, university students are more likely to continue smoking if they initiate the smoking activity during their teenage years which can causes serious health issues like nicotine addiction, lung damage, and cardiovascular disease. Evidence highlighted that smoking rates among nursing students quite high, despite the role's potential of providing smoking cessation education to the patient and community. Objective: Thus this study aims to determine the smoking prevalence among nursing students, their knowledge, attitude, and practice towards smoking. Methods: A cross-sectional study was conducted using a validated self-administered questionnaire among nursing students at International Islamic University Malaysia (IIUM). Results: A total of 270 IIUM nursing students have participated in the survey. The median age of the participants was 21-23 years; 31.9% of them were males and 68.1% were females. The percentage of active smokers and ex-smokers was 10.0%, and 4.8%, respectively. About 83.8% of the respondents had a good knowledge about smoking and its 'risk factors, 71.8% of them had a positive attitude towards disagreement on smoking behaviour, and the majority of the students (98.5%) had a good practice on smoking prevention and cessation. Conclusion: Smoking prevalence among nursing students in IIUM is quite low and their knowledge, attitude and practice emphasizes the effectiveness of health promotion on smoking cessation exposure during their undergraduate study program. Thus, future study should also investigate on to what extent the nursing students had integrate the smoking cessation education into clinical practice or community as preparation for their future healthcare role.*

**Keywords:** *Nursing Student, Smoking, Vaping, Cessation, Knowledge*

## Introduction

Cigarette smoking ultimately affects human health and the smoking habit demands immediate attention. Due to the community's lack of awareness, smoking is still in high prevalence and keeps increasing in the blink of an eye. The burden of tobacco use, including cigarette smoking, on global public health is significant and continues to rise. More than 8 million people worldwide lose their lives to tobacco each year, making it the leading cause of premature death among regular users of tobacco products (WHO, 2024). Globally, there are wide variations in the prevalence of smoking among university students. For instance, the prevalence is as low as 11.1% in New Zealand (Wamamili et al., 2019), 15.5% in the UK (Bartington et al., 2020), and very high as 60.2% in Bangladesh (Hossain et al., 2017). In Malaysia, between 12% and 22.4% of college students smoke (Azmi et al., 2021). As young adults, university students are particularly susceptible to the initiation of risky behaviors such as drug abuse and smoking (Creamer et al., 2019 and Wu et al., 2019). Meanwhile evidence highlighted that smoking rates among nursing students quite high, despite the role's potential of providing smoking cessation education to the patient and community. Thus this study aims to determine the smoking prevalence among nursing students, their knowledge, attitude, and practice towards smoking as limited data is available in the local setting. Understanding nursing students' knowledge, attitude and practice towards smoking can aid public health awareness campaigns and equip graduates to provide impactful health education leading to improved community health outcomes, and an overall healthier population.

## Literature Review

Health care professionals, such as nurses, are essential in providing cessation services. Nurses often spend more time and have more consistent contact with patients. They also make up a sizable portion of the clinical healthcare workforce. Given the challenges of regularly involving physicians in the services, nursing-led tobacco cessation interventions are also essential (Nichter et al., 2018). Furthermore, research has demonstrated that smokers and society at large regard nurses and nursing students as role models (Fernández-García, Ordás, Fernández-Peña, Bárcena-Calvo, Ordoñez, Amo-Setién et al., 2020).

However, a systematic review highlighted that nursing students often have insufficient awareness about the health risks associated with smoking and vaping. Its further indicate gaps in understanding the long-term health implications of e-cigarettes and the addictive potential of nicotine. Furthermore, many healthcare students including nursing student lack training in smoking cessation interventions, limiting their ability to counsel patients effectively (Ayesha, 2022).

A multicentre studies highlighted that some students perceive vaping as less harmful than traditional cigarettes, influenced by marketing and misinformation. Their attitudes towards cessation efforts often depend on their personal experiences and educational background in public health (Fernández-García, et al., 2020). Despite being future health advocates, nursing students frequently demonstrate limited engagement in smoking prevention or cessation efforts due to inadequate curricular emphasis on tobacco control strategies. Structured training in counselling and cessation techniques is needed to enhance their readiness (Selph, Patnode, Bailey, Pappas, Stoner, Chou et al., (2020).

In relation to demographic, studies showed there was an association between student's gender and their knowledge, attitude and practice (KAP) toward smoking where males have a higher percentage of good KAP compared to females (Al-Shami et al., 2018; Mustafa et al., 2023).

Other study found there was no correlation between smoking status with KAP level among nursing students (Pingak & Miller, 2019).

## Methods

This study employed a quantitative cross-sectional design among nursing students at IIUM as the nursing student's enrollment number was the highest among the other public universities. For data collection, a validated self-administered questionnaire was used (Al-Shami et al, 2018). The questionnaire consists of four parts which are the first part is about socio-demographic data, the second part is about knowledge of smoking, the third part is related to attitude and the last part is about practice towards smoking. Part A consisted of the socio-demographic data of the students including age, year of study, smoking status, gender, etc. Part B included 12 multiple-choice questions regarding participants' knowledge about smoking. The participants were asked to select one out of three options ("yes=2", "no=1" or "don't know=0"). The score is categorized as good and poor knowledge. Part C included 14 multiple-choice questions about the participants' attitude towards smoking behavior. The answer options were ("agree=2", "disagree=1" or "unsure=0"). Part D also consisted of 10 multiple-choice questions with the answer options of "yes=2", "no=1" and "do not know=0" regarding the practice of smoking prevention, smoke-free policy, and smoking cessation. The convenient sampling method was used to recruit the participants based on inclusion criteria which were undergraduate nursing students and the students who were on long leave and MC were excluded. The study ethical approval was obtained from the IIUM Research Ethics Committee (IREC) and Kulliyah of Nursing Postgraduate & Research Committee (KNPGRC).

## Results

A total of 270 students were involved in this study and demographic overview as in Table 1. The data collected covers a wide range of variables including age, state of origin, residence, year of study, ethnicity, religion, marital status, source of funding, smoking status, years of smoking, cigarettes smoked per day, presence of family members who smoke, and attempts to quit smoking. More than half of the participants were aged 21-23 years old with a percentage of 71.5%, 19.3% of the students were aged 20 years old and below, and 9.3% were aged 24 years old and above. Students hail from various states across the country, with notable representation from Johor (21.5%), Kelantan (14.8%), and Selangor (13.7%), and the least represented state is Perlis with 1.1%. Most of the students were living on campus with a percentage of 94.1% while 5.9% were off campus. The study sample is balanced across all four years of the nursing students, with each year contributing approximately a quarter of the total participants which is 25% each year of study. Other than that, there is a higher representation of female students (68.1%) compared to male students (31.9%) in the study. This gender distribution indicates that more female nursing students participated in the study, which reflects the overall gender distribution in Kulliyah of Nursing, IIUM. Next, the majority of the participants were Malay with a percentage of 97.0% and 3.0% were Bajau, Bugis, Melanau, Murut, and Bumiputera Sabah. All of the students were Islam and single. Most students are funded through sponsorship (71.1%), while the remaining are supported by parents (28.5%). The majority of the participants are non-smokers, comprising 85.2% of the sample. Active smokers account for 10.0%, while ex-smokers make up 4.8% of the participants. This distribution highlights that a significant portion of the nursing students do not smoke, and a smaller percentage are either current or former smokers. The duration of smoking varies with 4.8% of the smokers smoking for 5 years and above while 10.0% smoked for below 5 years. Additionally, among smokers, 4.4% smoked 5 pieces and above cigarettes per day, while 10.4% smoked less than 5 pieces of cigarettes per day. Moreover, 59.6% of the participants reported

that at least one of their family members smoked in the house. Finally, 13.0% of the smokers reported that they have attempted to try to quit smoking.

**Table 1: Socio-Demographic Data of Nursing Students**

Characteristics	Variables	Frequency (n=270)	Percentage (%)
Age	≤ 20 years old	52	19.2
	21-23 years old	193	71.5
	≥ 24 years old	25	9.3
State of Origin	Johor	58	21.5
	Kedah	17	6.3
	Kelantan	40	14.8
	Kuala Lumpur	13	4.8
	Pahang	32	11.9
	Melaka	10	3.7
	Negeri Sembilan	5	1.9
	Penang	2	0.7
	Perak	12	4.4
	Perlis	1	0.4
	Selangor	37	13.7
	Sabah	9	3.3
	Sarawak	3	1.1
	Terengganu	31	11.5
	Residence in Kuantan	On campus	254
Off campus		16	5.9
Year of study	Year 1	68	25.0
	Year 2	67	25.0
	Year 3	68	25.0
	Year 4	67	25.0
Gender	Male	86	31.9
	Female	184	68.1
Ethnicity	Malay	262	97.0
	Chinese	0	0
	Indian	0	0
	Others	8	3.0
Religion	Islam	100	100.0
Marital status	Single	100	100.0
Source of funding	Parents	77	28.5
	Sponsorship (JPA, MARA, PTPTN, etc.)	192	71.1
	Others	1	0.4
Smoking/Vaping status	Active smoker/vaper	27	10.0
	Ex-smoker/vaper	13	4.8
	Non-smoker/vaper	230	85.2
Years of smoking/vaping	Never	230	85.2
	≤ 1 year	9	3.3
	2 years	4	1.5
	3 years	9	3.3

	4 years	5	1.9
	≥ 5 years	13	4.8
Cigarettes smoked/puff per day	Never	230	85.2
	1 pcs/puff	8	3.0
	2 pcs/puff	7	2.6
	3 pcs/puff	7	2.6
	4 pcs/puff	6	2.2
	≥ 5 pcs/puff	12	4.4
	Family members who smoke/vape in the house	Yes	161
No		109	40.4
Attempts to try to quit smoking/vaping	Yes	35	13.0
	No	235	87.0

Table 2 summarizes the results of knowledge level related to smoking among nursing students, categorized by their year of study, smoking status, and gender. The median knowledge score was 16. The respondents with a knowledge score of  $\leq 16$  were classified as having poor knowledge, while those with a score of  $> 16$  were classified as having good knowledge. From the total of 270 students, almost all have good knowledge about smoking which is 83.8% while 16.2% have poor knowledge of smoking. Year 2 students had the highest percentage of good knowledge (22.8%) while Year 1 students had the lowest percentage of good knowledge (18.0%). Non-smokers had the highest percentage of good knowledge (70.5%) compared to active smokers (8.9%) and ex-smokers (4.4%). A higher percentage of female students (58.5%) possessed good knowledge about smoking compared to male students (25.3%).

**Table 2: Knowledge On Smoking Among Nursing Students**

Variables	Knowledge on Smoking				Total	
	Poor ( $\leq 16$ )		Good ( $> 16$ )		N	%
	n	%	n	%		
<b>Year of study</b>						
Year 1	19	7.0	49	18.0	68	25.0
Year 2	6	2.2	61	22.8	67	25.0
Year 3	9	3.3	59	21.7	68	25.0
Year 4	10	3.7	57	21.3	67	25.0
Total	44	16.2	226	83.8	270	100.0
<b>Smoking status</b>						
Active smoker	3	1.1	24	8.9	27	10.0
Ex-smoker	1	0.4	12	4.4	13	4.8
Non-smoker	40	14.7	190	70.5	230	85.2
Total	44	16.2	229	83.8	270	100.0
<b>Gender</b>						
Male	18	6.6	68	25.3	86	31.9
Female	26	9.6	158	58.5	184	68.1
Total	44	16.2	226	83.8	270	100.0

Table 3 summarizes the results of attitudes on disagreement of smoking behaviour among nursing students, categorized by their year of study, smoking status, and gender. The median knowledge score was 17. The respondents with an attitude score of  $\leq 17$  were classified as

having a negative attitude, while those with a score of >17 were classified as having a positive attitude. From the total of 270 students, 71.8% showed a positive attitude while 28.2% showed a negative attitude towards disagreement of smoking behaviour. Year 1 students had the highest percentage of positive attitude (19.1%) while Year 3 students had the lowest percentage of positive attitude (16.5%). Non-smokers had the highest percentage of positive attitude (63.3%) compared to active smokers (5.6%) and ex-smokers (2.9%). A higher percentage of female students (48.5%) possessed positive attitude about smoking behaviour compared to male students (23.3%).

**Table 3: Attitudes on Disagreement of Smoking Behaviour among Nursing Students**

Variables	Attitudes on disagreement of Smoking Behavior				Total	
	Negative ( $\leq 17$ )		Positive ( $> 17$ )		n	%
	n	%	n	%		
<b>Year of study</b>						
Year 1	16	5.9	52	19.1	68	25.0
Year 2	20	7.5	47	17.5	67	25.0
Year 3	23	8.5	45	16.5	68	25.0
Year 4	17	6.3	50	18.7	67	25.0
Total	76	28.2	194	71.8	270	100.0
<b>Smoking status</b>						
Active smoker	12	4.4	15	5.6	27	10.0
Ex-smoker	5	1.9	8	2.9	13	4.8
Non-smoker	59	21.9	171	63.3	230	85.2
Total	76	28.2	194	71.8	270	100.0
<b>Gender</b>						
Male	23	8.6	63	23.3	86	31.9
Female	53	19.6	131	48.5	184	68.1
Total	76	28.2	194	71.8	270	100.0

Table 4 summarizes the results of practice level related to smoking prevention and cessation among nursing students, categorized by their year of study, smoking status, and gender. The median knowledge score was 11. The respondents with a practice score of  $\leq 11$  were classified as having poor practice on smoking prevention and cessation, while those with a score of  $> 11$  were classified as having good practice. From the total of 270 students, most of the students showed good practice (98.5%) while 1.5% showed poor practice towards smoking prevention and cessation. All of the students from Year 2 and Year 4 had good practice with a percentage of 25.0%. Non-smokers had the highest percentage of good practice (84.8%) compared to active smokers (8.9%) and ex-smokers (4.8%). A higher percentage of female students (67.7%) possessed good practice about smoking prevention and cessation compared to male students (30.8%).

**Table 4: Practice on Smoking Prevention/Cessation**

Variables	Practice on Smoking Prevention/Cessation				Total	
	Poor ( $\leq 11$ )		Good ( $> 11$ )		n	%
	n	%	n	%		
<b>Year of study</b>						
Year 1	3	1.1	65	23.9	68	25.0
Year 2	0	0	67	25.0	67	25.0
Year 3	1	0.4	67	24.6	68	25.0
Year 4	0	0	67	25.0	67	25.0
Total	4	1.5	266	98.5	270	100.0
<b>Smoking status</b>						
Active smoker	3	1.1	24	8.9	27	10.0
Ex-smoker	0	0	13	4.8	13	4.8
Non-smoker	1	0.4	229	84.8	230	85.2
Total	4	1.5	266	98.5	270	100.0
<b>Gender</b>						
Male	3	1.1	83	30.8	86	31.9
Female	1	0.4	183	67.7	184	68.1
Total	4	1.5	266	98.5	270	100.0

Table 5 shows the summary of the analysis of ANOVA results. The knowledge about smoking significantly differs among students across the different years of study ( $p$ -value = 0.001), with Year 2 students showing the highest mean knowledge score (20.12) and Year 1 students showing the lowest (17.68). The significant F-statistic (6.019) indicates that the differences in means are statistically significant. The attitude towards smoking behaviour does not significantly differ among students in different years of study ( $p$ -value = 0.220), with all years showing similar mean scores. The F-statistic (1.481) is not significant, indicating no substantial difference in attitudes. The practice towards smoking prevention and cessation significantly differs among students in different years of study ( $p$ -value = 0.001), with Year 2 students showing the highest mean practice score (27.25) and Year 1 students showing the lowest (24.92). The significant F-statistic (5.722) indicates that the differences in means are statistically significant.

**Table 5: Association between Knowledge, Attitude, and Practice Towards Smoking Among Nursing Students with Year of Study**

Year of Study	Knowledge on Smoking			
	n	Mean (SD)	F-statistic (df)	P-value
Year 1	68	17.68 (5.337)	6.019 (3,269)	0.001
Year 2	67	20.12 (2.502)		
Year 3	68	19.41 (2.706)		
Year 4	67	19.24 (2.469)		
Year of Study	Attitude on disagreement on Smoking Behavior			
	n	Mean (SD)	F-statistic (df)	P-value
Year 1	68	20.11 (3.408)	1.481 (3,269)	0.220
Year 2	67	19.54 (3.513)		
Year 3	68	19.16 (3.141)		

Year of study	n	Mean (SD)	F-statistic (df)	P-value
Year 1	68	24.92 (5.112)	5.722 (3,269)	0.001
Year 2	67	27.25 (2.862)		
Year 3	68	25.56 (4.101)		
Year 4	67	26.882.490)		

Table 6 shows the summary of the analysis of ANOVA results. The knowledge about smoking does not significantly differ among active smokers, ex-smokers, and non-smokers (p-value = 0.266). Although ex-smokers have the highest mean knowledge score (20.23) and active smokers have the lowest (18.33), the differences are not statistically significant, as indicated by the F-statistic (1.332). Attitudes towards smoking behaviour do not significantly differ among the three groups (p-value = 0.180). Non-smokers have a slightly higher mean attitude score (19.64) compared to active smokers (18.73) and ex-smokers (18.54), but the differences are not statistically significant, as indicated by the F-statistic (1.727). The practice towards smoking prevention and cessation does not significantly differ among active smokers, ex-smokers, and non-smokers (p-value = 0.578). Non-smokers and ex-smokers have similar mean practice scores (26.21 and 26.38, respectively), while active smokers have a lower mean score (25.43). However, the differences are not statistically significant, as indicated by the F-statistic (0.549).

**Table 6: Association between Knowledge, Attitude, and Practice with Smoking Status**

<b>Knowledge on Smoking</b>				
Smoking status	n	Mean (SD)	F-statistic (df)	P-value
Active smoker	27	18.33 (6.890)	1.332 (2,270)	0.266
Ex-smoker	13	20.23 (3.140)		
Non-smoker	230	19.13 (2.949)		
<b>Attitude on disagreement on Smoking Behaviour</b>				
Smoking status	n	Mean (SD)	F-statistic (df)	P-value
Active smoker	27	18.73 (4.242)	1.727 (2,270)	0.180
Ex-smoker	13	18.54 (3.256)		
Non-smoker	230	19.64 (2.982)		
<b>Practice on Smoking Prevention/Cessation</b>				
Smoking status	n	Mean (SD)	F-statistic (df)	P-value
Active smoker	27	25.43 (6.399)	0.549 (2,270)	0.578
Ex-smoker	13	26.38 (3.731)		
Non-smoker	230	26.21 (3.487)		

Table 4.4 presents the results of a t-test analysis comparing the mean scores of knowledge, attitude, and practice towards smoking between male and female students. Based on the analysis, it can be concluded that there was no association between knowledge, attitude, and practice towards smoking with gender among IUM nursing students with a p-value of >0.05 each.



**Table 7: Association Between Knowledge, Attitude, And Practice Towards Smoking Among Nursing Students with Gender.**

Variables	Mean (SD)		Mean diff. (95% CI)	t-statistic (df)	p- value
	Male (n=86)	Female (n=184)			
Knowledge on Smoking	18.84 (4.784)	19.21 (2.862)	-0.369 (-1.457, 0.718)	-0.672 (119.383)	0.503
Attitude towards Smoking Behavior	19.63 (3.647)	19.42 (2.907)	0.205 (-0.668, 1.079)	0.464 (143.868)	0.643
Practice towards Smoking Prevention/Cessation	26.09 (4.711)	26.15 (3.469)	-0.062 (-1.172, 1.047)	-0.111 (135.708)	0.912

### Discussions

This study revealed that, almost all nursing student have good knowledge about smoking and only few have poor knowledge on smoking. This was evident across all years of study, indicating a strong foundation in smoking-related knowledge. These findings are consistent with previous research (Al-Shami et al., 2018 and Haddad et al., 2020), that reported university students possessed comprehensive knowledge about the dangers of smoking and the benefits of cessation. The high level of knowledge observed among nursing students might be attributed to several factors. First, nursing curriculum places significant emphasis on educating students about the health risks associated with smoking. Courses in pathophysiology, pharmacology, and community health provide detailed information on how smoking affects various body systems and contributes to chronic diseases. Furthermore, clinical rotations offer practical experiences where students witness the adverse effects of smoking on patients' health, reinforcing their theoretical knowledge. The good knowledge of smoking among nursing students has important implications for both nursing education and practice. Further, in this study setting the elective course on smoking cessation was offered to the final year students. In this course, educators incorporating more advanced smoking cessation techniques and patient counseling skills. In clinical settings and community setting, nursing students get a chance to apply their knowledge to educate patients about the risks of smoking and provide effective support for smoking cessation. They were actively involved in the project based community engagement as part of their course requirement. As future healthcare providers, these students perhaps are well-prepared to advocate for smoking prevention and cessation. Their ability to educate patients and the community about the dangers of smoking and the benefits of quitting is crucial for public health efforts to reduce the prevalence of smoking and its associated health burdens.

Our study reported that the majority of the students have a positive attitude towards disagreement on smoking behavior. This trend was consistent across all years of study, suggesting a uniform stance against smoking within the nursing student population. These findings are in line with previous research that has documented positive attitudes towards smoking among healthcare students (Al-Omari et al., 2021, and Pingak & Miller, 2019). The positive attitudes is likely to shape students' perceptions towards disagreement on smoking behavior. Clinical experiences further reinforce these attitudes, as students frequently encounter patients suffering from smoking-related illnesses. Additionally, the professional and ethical standards upheld by the nursing profession, which prioritize patient well-being and preventive care, contribute to a strong opposition to smoking.

The study reported that almost all students exhibit good practice on smoking prevention or cessation and only few exhibiting poor practice. These findings are in align with previous research indicating that nursing students are well-prepared to engage in smoking prevention and cessation efforts (Mustafa et al., 2023), suggesting that nursing education effectively equips students with the necessary skills and attitudes to promote smoke-free environments and support smoking cessation. Nursing students play a pivotal role in preventing smoking by giving health education regarding the risks associated with smoking and the benefits of quitting smoking to their patients and friends from other courses. They also can facilitate or participate in support groups for individuals trying to quit smoking as it can provide peer support and motivation.

This study reported that there was an association between knowledge and practice with year of studies. It may suggest that the knowledge and practices were evolve as students moving forwards as years of studies. However, there was no association between gender, smoking status and their KAP on smoking. These findings quite similar with the multicenter studies that found demographic variables like gender and smoking status did not significantly influence their knowledge of smoking risks or their attitude toward cessation efforts. This suggests that other factors, such as curriculum design and targeted interventions, might play a more substantial role in shaping KAP related to smoking behaviors health (Fernández-García, et al., 2020).

### **Recommendation**

Future research could expand across different institutions and regions to provide a more comprehensive data.

### **Limitation**

Our study was conducted at a single institution, which may limit the generalizability of the findings. The time for data collection was constraint and most of the nursing students were on clinical posting during the data collection. They were posted to various places at the community setting which researcher having difficulty to following up the responses from them. The self-reported nature of assessments may introduce bias, and the study's cross-sectional design limits the ability to infer causality.

### **Conclusion**

In conclusion, the nursing students are prepared to imparting essential health information as they have an adequate knowledge and practice on smoking cessation. This is not only preparing students for their future roles as healthcare providers but also positions them as key front liners in smoking prevention and cessation efforts.

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