Original Article

doi:10.31674/mjn.2025.v16i04.001

Assessing Knowledge, Attitudes and Cessation Intentions among University Students Using e-Cigarettes (HiPak): A Basis for Education

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ABSTRACT

Background: E-cigarettes, also known as "HiPak", have surged in popularity worldwide. This led to higher e-cigarette smoking rates, which pose significant health risks. In the Philippines, present research on university students' e-cigarette uses and risk factors is inadequate. **Objectives:** This study aimed to explore the knowledge, attitudes, and cessation intentions toward e-cigarette use of university students. **Methods:** A descriptive correlational research design was used with a modified questionnaire as an instrument. Purposive sampling was used. Frequency and percentage were used to describe the results. The Mann-Whitney U Test was used to determine the relationship between participants' attitudes towards e-cigarettes and knowledge of health risks and the Kruskal-Wallis H Test for knowledge of health risks and cessation intention. **Results:** Using the Mann-Whitney U test and Kruskal-Wallis H-Test with a *p*-value at 0.05, the results showed that there is no significant difference between the user's knowledge when grouped according to their demographic profile except for the current living condition, which has a *p*-value of 0.016. On the other hand, there was a significant difference between the user's knowledge and their perception that using e-cigarettes makes smokers look relaxed and more acceptable by society than conventional cigarettes, with a *p*-value of 0.033. **Conclusion:** Therefore, the reasons why university students smoke e-cigarettes are for socialisation, to relieve stress, and the different flavours. The students only have a moderate level of knowledge regarding the health risks of e-cigarettes. This means that there is a need to conduct health teachings regarding effective stress coping techniques and the health risks of using e-cigarettes. For future studies, it is recommended to consider other variables which may influence the use of e-cigarettes among students.

Keywords: Attitude; Cessation Intention; e-cigarette; Smoking; University Students

INTRODUCTION

E-cigarettes are defined as electronic vaping devices that are handheld and produce, for inhalation, an aerosol formed by heating an e-liquid using a battery-powered heating coil (Conde *et al*., 2024). Since their introduction in 2004, e-cigarettes have become widely available, and their usage has expanded rapidly across the globe, particularly among adolescents and young people (Alkhonain *et al*., 2025; Palmes *et al*., 2021). The Global State of Tobacco Harm Reduction (GSTHR) projected that there would be 82 million e-cigarette users globally in 2021, marking a 17% increase from 2020. This estimate includes 2.7 million Filipinos, representing nearly 3% of the world's vape users. Electronic cigarettes (e-cigarettes) are the most widely used tobacco/nicotine product among US middle and high school adolescents (Halpern-Felsher, 2024). In England, there has been an increase in youth vaping since 2021 (Jackson *et al*., 2024).

The widespread presence of e-cigarette use in schools has likely normalised not only the use of e-cigarettes but also "smoking-like" behaviours in general, making students more prone to e-cigarette smoking. While e-cigarettes may be less harmful than traditional cigarettes, they are not risk-free and are associated with various health issues such as cardiovascular disease, respiratory problems, and potential addiction (Kaondera-Shava, 2024). There is numerous detrimental health outcomes connected with adolescent tobacco use, with addiction risk being the most prominent. Electronic cigarettes, like regular cigarettes, can cause

Received: August 29, 2024 Received in revised form: February 17, 2025 Accepted: March 4, 2025

nicotine addiction, elevated heart rate and blood pressure, and acute pain associated with inflammation (Farsalinos & Polosa, 2014). E-cigarette usage has been linked to asthma, lung damage, higher levels of inflammation, and oxidative stress, all of which are risk factors for atherosclerosis (MacDonald & Middlekauff, 2019).

As counsellors, educators, role models, advocates, and leaders, nurses and other healthcare professionals play a critical role in combating global tobacco addiction. Unfortunately, the existing literature on university students—specifically on e-cigarette use and the surrounding risk factors—is inadequate. In developing nations such as the Philippines, available knowledge remains insufficient. By identifying university students' current knowledge, attitudes, and cessation intentions, we can determine how they view e-cigarette smoking in general. Understanding users' perceptions is crucial in strategizing how to combat the use of e-cigarettes among adolescents, particularly university students, and in creating policies or programmes that support smoking cessation.

Research Objectives

To determine the demographic profile of the e-cigarette users.

To determine users' knowledge regarding the health risks of using e-cigarettes.

To determine the attitudes and perceptions of users towards using e-cigarettes.

To determine the smoking cessation intentions among e-cigarette users.

To determine whether there is a significant difference between participants' socio-demographic profile and their knowledge on e-cigarette health risks.

To determine if there is a significant difference between participants' attitudes and perceptions, and their knowledge on the health risks

METHODOLOGY

Research Design

This study used a descriptive correlational design. The research locale is Mindanao State University Iligan Institute of Technology.

Sampling Technique

Purposive sampling was used to gather the respondents. The respondents were aged 18 and above and were registered as students of MSU-IIT for the second semester of the school year 2023–2024.

Data Gathering Procedure

Data gathering was conducted over a period of three months using a modified questionnaire, and respondents were selected through a referral system. This limitation meant that the researchers opted to gather data from 100 respondents, as this number was considered sufficient to obtain adequate data from the population.

Research Instrument

The modified questionnaire was drawn from previously conducted studies and surveys. There is no specific area from which the questions were taken. E-cigarette use questions were drawn from the Global Adult Tobacco Survey and the American Cancer Society's Tobacco-Free Generation Campus Initiative: Cohort 5 Student Survey 2020–2021.

The Global Adult Tobacco Survey is an international survey that tracks tobacco use among adults aged 15 and older, helping countries develop effective tobacco control policies (GATS, 2020). The American Cancer Society's Tobacco-Free Generation Campus Initiative: Cohort 5 Student Survey is a data collection effort aimed at assessing the impact of the Tobacco-Free Generation Campus Initiative on college campuses.

Questionnaire Structure

The questionnaire had five sections. The first section covered the demographic profile of the respondents,

including gender, age, college department, academic level, monthly family income, and living conditions. The second part consisted of questions regarding the students' use of e-cigarettes. The third section assessed the students' knowledge of the health effects of e-cigarettes. The fourth section evaluated their attitudes towards the use of electronic cigarettes. The fifth part examined the students' intentions to quit smoking.

A pilot study yielded a Cronbach's alpha value of 0.83. Informed consent was obtained from the participants. The questionnaire was then distributed among them. Data were analysed after reaching the target number of participants, using the appropriate statistical tools.

Statistical Analysis

Data analysis was conducted using R Studio. R is a free programmable statistical software, with a focus on data analysis. It consists of a platform on which the so-called "packages" (similar to applications) can be installed to perform certain functions (Ariel de Lima *et al*., 2022). All variables were subjected to descriptive univariate analysis. Frequency, mean and standard deviation were used. Bivariate analyses were also conducted to delve into the relationships between e-cigarette usage and socio-demographic variables, e-cigarette use and knowledge items, and knowledge items and respondents' smoking cessation intentions. The Mann-Whitney U Test was used to examine whether there are significant differences in participants' attitudes toward e-cigarettes based on their awareness of health risks. The Kruskal-Wallis H Test was used to determine whether there is a significant relationship between participants' understanding of the health risks connected with e-cigarette usage and their desire to quit. The *p*-value of 0.05 was used.

Ethical Consideration

The research obtained ethical clearance from the Research Ethics Committee of Mindanao State University, Iligan Institute of Technology, Philippines, with reference number E-2023-71 on 31st of December 2023.

RESULTS

Table 1: Demographic Profile

Characteristics	No. of Respondents
Sex	
Male	59
Female	41
Academic Level	
1st Year	14
2nd Year	21
3rd Year	13
4th Year	52
Current Living Condition	
I live with family	58
I live in my own household	1
I live in a dormitory	41
Age	
18 below	2
19-20 years old	31
21-22 years old	60
23-24 years old	7

The table above presents the demographic profile of the participants. It indicates that more male respondents use e-cigarettes, the majority are in their fourth year, and most live with their families. The largest age group falls within the 21–22 years age range.

Table 2: Times of Using e-cigarettes

Time	No. of Respondents
During times of socialisation	68
During stressful times	66
Others	27
During university or school hours	20

Table 2 shows that the majority of the respondents use e-cigarettes during the times of socialisation and during stressful times.

Table 3: Knowledge of Participants Regarding Health Risks

Level of Knowledge (No. of Correct Answers)	No. of Respondents
1-4 = Low	24
5-6 = Moderate	58
7-8 = High	18

Table 3 above shows that the majority of the respondents only have a moderate level of knowledge regarding the health risks of e-cigarette smoking.

Table 4: Relationship between Knowledge of Participants and Demographic Profile

Characteristics	Knowledge on Health Risks	Test for Significant Difference	Interpretation
Sex	**Mean (SD)**		
Male	4.86 (1.74)	$^{a}U = 974$, $p = 0.089$	Not significant
Female	5.37 (1.74)		
Academic Level			
1st Year	5.43 (1.02)	$^{b}H(3) = 3.44$, $p = 0.328$	Not significant
2nd Year	5.14 (1.31)		
3rd Year	4.62 (1.33)		
4th Year	5.06 (2.12)		
Current Living Condition			
I live with family	4.72 (1.78)	$^{a}U = 858$, $p = 0.016$	Significant
I live in a dormitory	5.56 (1.61)		
Age			
19-20 years old	3.14 (2.54)	$^{b}H(2) = 4.73$, $p = 0.094$	Not significant
21-22 years old	5.17 (1.78)		
23-24 years old	3.14 (2.54)		
At What Age Did You First Try E -Cigarettes?			
Below 18	5.35 (1.22)	$^{a}U = 654$, $p = 0.626$	Not significant
18 and above	5.01 (1.84)		

a–Mann-Whitney U Test, b–Kruskall Wallis H Test

Table 4 shows no significant difference in the respondents' knowledge on health risks versus their demographic profiles except for their current living conditions, which has a *p*-value of 0.016.

Table 5: Attitudes and Perceptions of Respondents

Attitude and Perception Items	Respondents' Response				
	SA	A	N	D	SD
I use electronic vapor products because they are affordable	8	26	30	21	15
I use electronic vapor products because I can use them in places where smoking cigarettes is not allowed	17	35	21	12	15
I use electronic vapor products because they might be less harmful to me than smoking cigarettes.	13	24	32	19	12
I use electronic vapor products because they might be less harmful to people around me than smoking cigarettes.	12	28	28	21	10
I use electronic vapor products because they come in flavors, I like	41	29	13	4	13
I use electronic vapor products because they might help me quit smoking cigarettes.	18	18	23	16	25
I use electronic vapor products because they don't smell	32	26	18	14	10
I use electronic vapor products because my friends use them.	20	29	17	19	15
E-cigarettes make smokers look more relaxed and more acceptable by society than conventional cigarettes	15	21	16	17	31
Relieves one's stress	50	21	8	3	18

SA–Strongly Agree, A–Agree, N–Neutral, D–Disagree, SD–Strongly Disagree

Table 5 above shows the attitudes and perceptions of the respondents towards the use of e-cigarettes. The attitude that has the highest score is that it "relieves one's stress". The second highest score is "I use electronic vapor products because they come in flavours I like."

Table 6: Difference between Knowledge of the Respondents and Their Attitudes towards E-cigarettes

Attitude and Perceptions	Attitudes and Perceptions Versus Level of Knowledge *p*-value	Interpretation
I use electronic vapor products because they are affordable	0.309	Not significant
I use electronic vapor products because I can use them in places where smoking cigarettes is not allowed	0.088	Not significant
I use electronic vapor products because they might be less harmful to me than smoking cigarettes.	0.448	Not significant
I use electronic vapor products because they might be less harmful to people around me than smoking cigarettes.	0.319	Not significant
I use electronic vapour products because they come in flavours, I like	0.773	Not significant
I use electronic vapor products because they might help me quit smoking cigarettes.	0.779	Not significant
I use electronic vapor products because they don't smell	0.724	Not significant
I use electronic vapor products because my friends use them.	0.071	Not significant
E-cigarettes make smokers look more relaxed and more acceptable by society than conventional cigarettes	0.033*	Significant
Relieves one's stress	0.989	Not significant

**Kruskall Wallis H Test, significant at P < 0.05*

Table 6 shows that there is no significant difference between the knowledge of the respondents and their attitudes towards e-cigarettes, except for their perception that "e-cigarettes make smokers look more relaxed and more acceptable by society than conventional cigarettes.

Table 7: Smoking Cessation Intentions

Questions	Answers	Frequency
During the past 12 months, how many times have you stopped using e-cigarettes for one day or longer because you were trying to quit using e-cigarettes for good?	6 times or more	31
	3 to 5 times	26
	I did not try to quit	23
	2 times	10
	1 time	10
Are you seriously thinking about quitting e-cigarettes?	Yes, during the next 30 days	24
	Yes, during the next 6 months	19
	Yes, during the next 12 months	36
	No intention of quitting	21
Experience of smoking cessation education (education on stopping smoking) within the past year	Yes	20
	No	80
Do you have any pre-existing health conditions related to smoking, such as asthma?	Yes	20
	No	80
You were advised to quit smoking by_____ ?	Significant Others (refers to the important people in your life)	42
	Medical Professionals	7
	Both	21
	None	30

Table 7 shows the smoking cessation of the participants. When asked how many times during the past 12 months did the participant try to quit smoking, the majority answered 6 times to more. When asked if they are serious in quitting e-cigarettes, the majority answered "yes, during the next 12 months." Majority had no pre-

existing health conditions. When asked who advised them to quit smoking, the majority answered their "significant others."

DISCUSSION

Based on the demographic profile (Table 1), the majority of the participants were male, 4th year, lived with their family, and aged 21-22 years old. A study among French university students regarding the use of e-cigarettes resulted in a median age of 21 years old (Kinouani *et al*., 2025a). Previous studies have established a correlation between e-cigarette usage and male sexual orientation among adolescents (Resano *et al*., 2022; Wibowo *et al*., 2025; Alaboodi *et al*., 2025; Villanueva-Blasco *et al*., 2025). Men were more likely to be smokers than women (Vynckier *et al.*, 2025). Prevalence of smoking is higher in men than women (Guatibonza-García *et al*., 2025). A significant number of students who use e-cigarettes live near family members or peers. This finding has substantial implications for second-hand vapor exposure and highlights the impact of social influences on vaping habits. Majority of the participants (Table 2) use their e-cigarettes during socialisation and stressful times. This supports a study that found using e-cigarettes as an aid to socialise, work, study, relax, or sleep demonstrating college students' needs for coping strategies (Clendennen *et al*., 2023).

On the other hand, the results of a study entitled "Electronic Cigarettes Behavior Pattern and Health Locus of Control Among Young Adults" mentioned that majority of the respondents reported that they used to resort to the use of e-cigarettes when they faced any kind of stressful situation, particularly related to academics, family, and personal life stress (Vaidya *et al*., 2024). In terms of knowledge of the participants regarding the health risks of e-cigarette use (Table 3), the majority of the participants have a moderate level of knowledge. In determining the significant difference between the knowledge of the participants and their demographic profile (Table 4), there was no significant difference except for their current living condition with a *p*-value of 0.016.

The attitudes and perceptions of participants regarding e-cigarette use (Table 5) showed that the highest reason for using e-cigarette is that "it relieves stress", the second highest being "I use electronic vapor products because they come in flavors I like". This result supports a recent study that mentioned respondents' resort to the use of e-cigarettes when they faced any kind of stressful situation, and the calming, relaxing, and energising effects of e-cigarettes were noted post usage, leading to a frequent habit of e-cigarette use (Vaidya *et al.*, 2024). Findings show that higher stress, anxiety, and depression are associated with greater likelihood of vaping for tension reduction or relaxation (Lee *et al*., 2024). In that same study by Vaidya *et al*. (2024), the respondents reported that the variety of flavours available played a major role in their decision to consume e cigarettes and many of them reported that trying new flavours is an exciting process for them which allows them to experiment. The appeal of e-liquid flavors emerged as one of the most frequently reported extrinsic factors driving both initiation and continuation of e-cigarette use (Kinouani *et al*., 2025b; Alaboodi *et al.*, 2025; Li *et al.*, 2025; Villanueva-Blasco *et al*., 2025).

In determining if there is a significant difference between the knowledge of the participants and their attitude and perceptions (Table 6). There is no significant difference among them except for their perception that "e-cigarette make smokers look more relaxed and more acceptable by society than conventional cigarettes." Majority of the respondents Agree with this perception with a *p*-value of 0.033. The promotion of e-cigarettes for psychological and emotional relief, combined with appealing product features like flavors and sleek designs, significantly affects adolescents' attitudes and beliefs, making e-cigarette use appear desirable and socially acceptable (Adekeye *et al*., 2025).

For smoking cessation intentions, the majority of the participants wanted to quit smoking e-cigarettes, and they are actually being encouraged to quit by their significant others which is a positive sign and good start to quit smoking. Unfortunately, only 20% experienced a smoking cessation education within the past year. This is similar to a study in Croatia where 60% did not receive any smoking cessation education (Kajan *et al.*, 2025). Findings suggest that frequency and awareness of messaging that educates about e-cigarette harms to mental health and about cessation resources are associated with higher quitting intentions among young people who use e-cigarettes (Linda *et al.*, 2025). Based on the findings, it can be helpful to conduct

further studies regarding the coping mechanisms of students during stressful situations as it is the number one reason for engaging in e-cigarette smoking. In addition, a study could also be done if the flavours in e-cigarettes may also cause addiction.

Limitation

This study has several limitations. Firstly, the use of purposive sampling and a referral system may limit the generalisability of the findings due to potential selection bias. The relatively small sample size (100 respondents) also restricts the broader applicability of the results. Secondly, data were self-reported, which may be subject to recall bias or social desirability bias. As a cross-sectional study, it cannot establish causal relationships between knowledge, attitudes, and cessation intentions. The research was conducted in a single university, which may not reflect the experiences of students in other institutions or regions. Lastly, although the questionnaire was adapted from established surveys and tested for reliability, further validation specific to the local context is recommended.

CONCLUSION

There is a need to conduct health teachings regarding effective stress coping techniques as these university students use e-cigarettes as a way of coping with stress. As nurses, health education should also be conducted to university students regarding the health risks of using e-cigarettes and increase the coverage of smoking cessation education to reduce the number of users. The result of this study is significant in giving baseline data on the reasons for university students engaging in e-cigarette use. This is also significant for nurses to include in their health education for students that use e-cigarette, although are popular alternatives to conventional smoking, are still harmful to their health. For future scope of studies, it is recommended that a study on what are the effective methods of cessation education are to be used to increase the cessation rate. It is also recommended to consider other variables which may influence the use of e-cigarettes among students. This study is limited to the variables and factors discussed. Other variables which may affect the study but not discussed are not included in the study.

Conflict of Interest

The authors declare that they have no competing interests.

ACKNOWLEDGEMENT

The authors extend their sincere appreciation to the advisors for their constructive criticisms and valuable suggestions, which have significantly improved the quality of this paper. They also express profound gratitude to all the respondents who willingly participated in the study.

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