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ASSESSING KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING E-CIGARETTES AMONG UNDERGRADUATE NURSING STUDENTS

Persikla Tahir

Muqadas Mushtaq

Zoha Khalid

Author Details

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Corresponding E-mails & Authors*:

Persikla Tahir

Abstract

Background: smoking is a public health issue that has been trending among youngsters and adolescence in the form of modern smoking devices such as e-cigarettes. And as nursing students are future healthcare professionals thus their knowledge, attitude and practices will directly influence patient's recovery and well being

Objectives: The purpose of our study is to assess the knowledge, attitude and practices of undergraduate nursing students regarding e-cigarette.

Methodology: This survey was a cross sectional descriptive study conducted among nursing students with 139 sample size from a private nursing institute. The data was collected by structured questionnaire through stratified sampling technique with proportion allocation using Likert scale to measure the level of knowledge and awareness. The reliability was measured through Chronbach's Alpha that was 0.66 and 0.68. SPSS version 27 was used for data analysis of descriptive and inferential data.

Results: The findings of this study comprised that students containing youngsters with 71.2% range from 18-20 years and 61.9% were in their first year containing 50.4% female and 48.9% males. Most of the respondents have basic knowledge about nature of e-cigarette and around (70.5%) come

from families with minimal parental and sibling smoking. Peer influence and marketing techniques are a potential trigger in initiation of experimentation as around (29.5%) claimed it to effect them and (27.3%) got their first device from a peer and around(56.2%) claims that adverts make look vaping cool.

Conclusion: The study results revealed a higher level of knowledge along with positive attitude toward legislation and bans in Pakistan on smoking devices but also some potential triggers come to surface that is needed to be addressed through proper training, awareness campaigns and guidance along with policies and rules to avoid usage.

INTRODUCTION

Smoking is a worldwide issue with almost 1.3 billion smokers globally (1). From an estimate, 8 million people die annually by the smoking effects and in which 1.2 million deaths are due to passive smoking(2). The global burden of disease estimates that 25% men and 5% women smoke on daily basis(3). The impact of smoking in 2012 for world healthcare costs was \$422 billion that is equal to 1.8% of the annual world GDP(4). Despite the continuing programs to manage tobacco use, still its prevalence remains a health issue. A recent issue is the usage of new nicotine-containing products, such as electronic cigarettes, heated tobacco products and other emerging products gaining popularity among young generation(5).

Electronic cigarettes are trending among youngsters that deliver arrange of substances including chemicals, cannabinoids, flavorings and other compounds(6). First e-cigarette mostly known as vape was launched in China in 2004(7). E-cigarette is a battery powered device that electronically vaporize nicotine without combustion(8). It was started marketing as a healthier substitute or a safer alternative that's why it gained popularity. It was claimed that it offer a reduced risk smoking experience by eliminating harmful byproducts related to tobacco combustion(9). But in contrary e-cigarette also contain a range of harmful substances that includes formaldehyde, acrolein, volatile organic compounds and heavy metals like lead that not only effect the users but also to those who

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are exposed to second hand smoking(10). Even e-cigarette consumption can lead to impaired brain function and cognitive development(11).

E-cigarette that was initially built for smokers to assist them in refraining smoking but now it is being mostly consumed by individuals who have never smoked before. Recent reviews has estimated that young people consumption is 15.3% while current use is 4.4% and dual use is at 4%(12). In Asia, e-cigarette usage is reported at 16%(13). Us National Academic Of Sciences, Engineering And Medicine(NASEM) says that e-cigarette can be less risky for health but contrary to that it has the potential to encourage adolescence and adults using vape to switch to combustible cigarettes(14). Although these percentages are less than western countries but the rapid increase of e-cigarette markets in Pakistan will make our country vulnerable to an extreme rise.

Second-hand smoking also known as passive smoking when someone breathes in smoke produced by tobacco products that the exhaled by someone else(15). Almost 60,000 morbidities are reported as result of exposure to passive smoking globally(16). It is estimated that almost 21,400 deaths from lung cancer, 164,000 due to lower respiratory track infection, 379,000 from ischemic heart disease and 36,900 from asthma. These disease amount to a disease burden equal to 10.9 million years of life adjusted for disability (DALY) according to WHO (17). Friends, families, children and pregnant women related to smokers are at risk of developing harmful effects. Therefore, it's crucial to work related to prevention of second-hand smoking because people might not know the harmful effects. The Framework Convention on Tobacco Control (FCTC) proposed by the World Health Organization, focused on monitoring, protection against smoke exposure, cessation support, education of the population, advertising bans, and higher taxes as the measures to address the world tobacco epidemic. It was the first international treaty that started in 2005 (18). And the MPOWER strategy also prohibit tobacco smoking using six measures that is monitoring, protecting, offering help, warning, enforcing bans and promoting tobacco taxes (19).

Smoking initially occur before age 18, young adulthood is a time when smoking converts into regular use and nicotine dependence. University students are easily expose to smoking they face

several challenges during their stay including independence and for many leaving home. Some students also smoke in classrooms, hostel and gathering putting others at risk. Due to this these students have higher risk of future smoking than their age fellows. That's why young adults should be a primary target for smoking prevention programs (20). On the other side tobacco industry specifically markets to young adults (21).vapes are presented in youth friendly tastes like fruit candy, mint, chocolate and it design matches pen that attract strongly to youngsters and adolescence (22) (23). Further more the combination of easy availability, attracting advertisement eventually increase popularity among university students (24).

Nurses are front-line caregivers and largest group of health care professionals and most importantly, nurses spend much time directly with patients. As nurses build their professionalism at the university, thus its important to assess their smoking habits, behaviour, knowledge and attitude regarding smoking (25). Nurses play an important role in primary care delivery. They have the ability to influence healthy behaviors in patients (8). Nursing students' knowledge, attitude and practices regarding e-cigarette are much important because it has been reported that healthcare giver that smoke themselves are less likely to counsel their patients about smoking cessation (26).

As a part of the health workforce that is almost 50 percent of the global health workforce, nurses have a significant role to play in the control of tobacco by providing health education, counselling and assistance in quitting smoking (27). It has been indicated that nurse interventions are highly effective in promoting long term smoking abstinence but lack of training inhibit successful interventions (28). It has been reported that studies of nursing students across the world show a mixed level of knowledge, attitudes and practice toward e-cigarettes (29).

A systematic review and meta-analysis show 24% pooled smoking prevalence and while examining smoking prevalence by the basis of gender, male nurses had a higher pooled prevalence that is 28% as compared to female nurses that is 18% (30).but regardless of numerous interventions that has been implemented to reduce tobacco cessation and prevalence, many nursing students still report

smoking (31). Also despite the gain of knowledge through academic studies, any significant reduction in smoking behaviour among students has not been observed (32).

On the other side, there is an evidence that suggest that adding tobacco cessation education in academic course can improve nursing students skills and promote their ability to assist patient in smoking control (33).but minimal smoking cessation counseling by health professional world might be due to lack of proper training in undergraduate and postgraduate (28). Even in many nursing programs across the globe, tobacco cessation material is not very comprehensive. Research is a number of countries has demonstrated a lack of focus on the procedures, time, and success of the smoking cessation intervention in nursing program (29). This emphasize the act that there is the urgent need to incorporate evidence-based tobacco cessation training in nursing education programs. This study aims at measuring knowledge, attitude and practices regarding the e-cigarette use among nursing students at private hospital and the perceptions of the role of nurse in smoking cessation counseling. The research will facilitate better education and positive contribution to smokers by the undergraduate students through the improvement of their knowledge on the negative impacts of smoking and the use of e-cigarettes. The results could also be used to guide institutions on policies and education programs to decrease the use of e-cigarette and to determine loopholes in nursing programs so as to enhance the role of the trained healthcare personnel to enhance patient health outcomes.

CHAPTER 2

LITERATURE REVIEW

Smoking is one of the key issues of the general population, and the consumption of electronic cigarettes has grown at an accelerating rate over the last several years. Being front-line healthcare providers, nurses are critical to the idea of tobacco control hence the need to assess their knowledge, attitudes and practices regarding e-cigarettes to enable them efficiently assist patients in quitting smoking.

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It is a cross-sectional study of undergraduate nursing students in the Institute of Medicine, Nepal, with a sample of 302 students and its objective was to check the knowledge, attitudes, and practices of using e-cigarettes. Out of the respondents, 214 (70.9) had heard about e-cigarettes. Of the respondents who were aware, 71.5 percent showed sufficient knowledge, 62.2 percent expressed positive attitudes and 79.0 percent stated that they had never used e-cigarettes. The probability of male students using e-cigarettes as compared to female students was significantly high (AOR: 2.27; 95% CI: 1.01-5.01). Moreover, students whose friends smoked had almost thrice the probability of using e-cigarette (AOR: 3.00; 95% CI: 1.127-9.99). The positive attitudes toward e-cigarettes also were connected with the higher number of uses (AOR: 2.10; 95% CI: 1.02-4.35). Such results indicate why intensive educational and behavioral interventions should be a part of the healthcare education system in Nepal aimed at lowering the misconceptions and decreasing the use of e-cigarettes (9).

A cross-sectional study that was conducted in March-April 2024 in ten universities across Croatia used 1,039 undergraduate nursing students. Most of the participants (89 percent) were female, and 43 percent of the participants were smokers. Over 50 percent of the participants said they used e-cigarettes, 76 percent of whom used it recreationally. About a fifth of the population was of the opinion that e-cigarettes could be a valuable smoking cessation tool, but more than half of the population thought that, these devices may attract non-smokers to start smoking. It is interesting to note that 60 percent of the students said that they were not taught about smoking cessation at all in their education. The research has provided high tobacco and e-cigarette consumption rates among nursing students, lack of knowledge, and overall negative attitudes as some of the reasons, with educational gaps being significant (6).

In 2022, a cross-sectional study was performed in Zagreb, Croatia, where another study evaluated the smoking cessation among hospital nurses. A total of 258 nurses were involved in the study with 31 percent response rate. Although 43% claimed to regularly request patients on using tobacco, only 2.7% of them always helped patients to stop smoking. Few nurses had undergone recent smoking cessation training with 82 percent stating none at all. Almost fifty percent were smokers themselves.

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Although interventions based on nurses took the form of smoking cessation were found to be effective, their adoption by nurses was still low, possibly due to the lack of sufficient training and prevalence of smoking among nurses (1).

To investigate smoking habits in the Philippines, 122 senior nursing students were enrolled in West Visayas State University where most were female, non-smokers, and had knowledge on e-cigarettes. Nevertheless, they did not have sufficient information regarding e-cigarettes in general. This ignorance notwithstanding, students showed mostly negative perceptions toward the use of e-cigarettes, and thus the lack of awareness and little knowledge did not always translate to positive perceptions (8).

The study that was conducted was an Italian cross-sectional survey that explored the knowledge, beliefs, and attitudes of 77 nurses working in cardiology, cardiac intensive care, and surgical oncology units of two tertiary hospitals regarding smoking cessation counselling. The level of knowledge in nurses in the cardiac intensive care units was significantly higher than the one in the surgical oncology. Personal belief about smoking cessation in both specialties had a strong relationship with the attitude towards counselling. The results indicate that structured smoking cessation education can be incorporated in nursing and managerial training curriculum to increase knowledge, attitudes, and counselling (34).

A multistage cross-sectional study on 355 students of the University of Abuja in Nigeria was conducted. Over 60 percent answered that they had been exposed to second-hand smokes, even though most of them portrayed good knowledge and positive attitudes towards avoiding passive smoking. This research created a gap between awareness and exposure, and it is necessary to have institutional policies and educational programs to minimize passive smoking on college campuses (35).

Another cross-sectional study undertaken at Riyadh Elm University evaluated the smoking-related knowledge among 201 nursing students. Majority of the respondents were female and non-smokers, but a large percentage of them had family members who smoked. On the whole, there was an average

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degree of students on smoking. The level of knowledge was significantly correlated with marital status, education level, smoking behaviour, and past academic qualification. These results suggest that educational interventions should be implemented to reinforce smoking-related awareness in nursing students (36).

A cross sectional descriptive correlational study was conducted among 134 female undergraduate nursing students from a governmental university in Riyadh, Saudi Arabia. Most of them are non smokers and have good knowledge about harmful consequences of smoking but there is a need of proper training on smoking cessation techniques (25).

A study was conducted among 7162 students in universities of Milan, Italy but after informed consent 6605 was eligible. Female ratio was more than males and out of them most students never smoked while the students who smoked are prevalently males. Half of students were exposed to passive smoking in previous week. Awareness was present among students regarding harmful effects of smoking (5).

There was a multinational cross sectional, questionnaire based study conducted among dental students from 20 dental schools in 11 countries. out of 5697 students those who are current user shows a significant associations between knowledge, attitude and practices and country education level and gender.the knowledge was unsatisfactory yet their beliefs and attitude were acceptable. Tobacco training courses should be implemented in dental curricula.(37)

A cross sectional study was conducted among medical students at King Abdulaziz University (KAU), faculty of medicine, Jeddah, Saudi Arabia from May to June 2020. Out of 399 students, majority of them had misconceptions and inadequate awareness about e-cigarettes harmful effects. Academic programs he to be ed in the course or proper training and knowledge(38).

In Karachi, Pakistan a cross-sectional study had been conducted in January 2017 among 441 young individuals from age 13 to 17 to assess the knowledge attitude and practices related to e-cigarette. Out of these students mostly know about e-cigarette. Majority claimed that there was easy accessibility of these products. And majority had positive attitude toward prohibition and also

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believed that e-cigarettes were harmful. Furthermore, middle school students had negative attitude toward e-cigarette(39).

A mixed method approach was used with cross-section primary survey data in Pakistan to assess cigarette smokers and to determine the use of alternative nicotine delivery products. Most participants were ranged from 15 to 35 age. Majority of the smokers expressed that they wanted to quit smoking but were not aware how to do so and in Pakistan there was lack of smoking cessation training especially to healthcare professionals. Also Pakistan should conduct awareness campaigns on large scale to aware the citizens about the hazards of combustile smoking(40).

A cross-sectional online survey was conducted all over Pakistan from November to February 2016. out of 406 participants, most of them had heard of e-cigarette and half of them had awareness about e-cigarette that it contains nicotine. Furthermore, many also had a perceptions that e-cigarettes are less harmful than combustile cigarettes(7).

A cross-sectional survey was conducted in Khyber Paktunkhawa from October to December 2023 among 401 participants. Most of the participants lacked adequate knowledge, most of the users were young adults from higher economic status. It also highlighted a greater need fro public education and tobacco cessation training(41).

Although a lot of research has been conducted internationally, there still is a significant gap in the evidence produced in Pakistan. There is a lack of continuous smoking cessation interventions and limited studies have investigated the knowledge, attitude and practice of the nursing students with reference to smoking and use of e-cigarettes. Thus, the proposed research will evaluate the knowledge, attitudes, and practices of Pakistani undergraduate nursing students regarding smoking cessation counselling to assist in the enhancement of health outcomes and informed policy-making.

CHAPTER 3

3.1 Problem Statement:

Smoking is a global health issue and most commonly, the use of e-cigarettes is increasing on daily basis among teenagers and adults leading to serious consequences after long term use such as cancer, lung diseases and much more. Even after so many research, Pakistan is still among those countries where a significant amount of people die from smoking annually. Thus it's very crucial to identify the severity of this issue and address it as soon as possible. and nurses are the front line healthcare that deals with patients. Nurses own perception, attitude and practices about e-cigarettes will have a great impact on patients counselling about smoking cessation.

Although there are many researches on this topic, but in Pakistan, the data we have is still less to identify the problem properly. And the way this problem is rising will cause more harm to community in the coming years, if not managed or controlled. There is a gap among these researches, thus more research is required and we need to explore more about this issue so that better actions will be taken about this.

That's why our research will assess the present knowledge, attitude and practices of nursing undergraduates regarding about e-cigarettes and also their knowledge about smoking cessation techniques so that they could counsel patients in a better way. Our research will help to implement more policies that could help in cessation and control.

3.2 Hypothesis:

The hypothesis made is as follows:

- **Null Hypothesis:** Hypothesis H0 a: There is no knowledge to undergraduate nursing students about electric cigarettes.
- **Alternative Hypothesis:** Hypothesis H1 b: There is significant knowledge to undergraduate nursing students about electric cigarettes.

3.3 Purpose Of Study:

The purpose of this study will be to examine the knowledge, attitude and practices towards e-cigarettes among nursing students in gulab devi teaching hospital and to realize that nurses has a great role in counselling patients about quitting smoking.

3.4 Research Objectives:

The research objective of this study will be to;

- Assess the knowledge of undergraduate nursing students regarding e-cigarettes.
- Assess the attitude of undergraduate nursing students regarding e-cigarettes.
- Assess the practices of undergraduate nursing students regarding e-cigarettes.

3.5 Research Questions:

The research questions of this study will be;

- What is the knowledge of nursing undergraduates regarding e-cigarettes?
- What is the attitude of nursing undergraduates regarding e-cigarettes?
- What are the practices of nursing undergraduates regarding e-cigarettes?

3.6 Significance:

The current study is significant to nurses because through this study they gain knowledge which help them to educate patients who are e-cigarette user and it also enhance the productivity of health by better health education. Current study is significant to assess the knowledge, attitude and practice of undergraduate nursing students. Current study also enhance the knowledge about smoking cessation techniques which important for undergraduate student to help them to provide better understanding to smokers about bad effects of e-cigarette use.

Current study is also important for institutions to implement policies and planning to stop e-cigarette use. This research will help to identify the lack in nursing curricula for future nurses. That's

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why it is very important to trained health care providers to use strategies for the cessation of smoking and tobacco use. In short, to help the patient in improving their health status.

CHAPTER 4

METHODOLOGY

4.1 Study Design:

Our study design was cross-sectional research design to assess knowledge, attitude and practices of undergraduate nursing students toward e-cigarettes.

4.2 Study Duration:

Our study duration had been from 1st January 2026 to April 30 2026.

4.3 Study Setting:

The study was conducted in the setting of Al-aleem institute of nursing. This institute provide variety of programs including BSN(4 years degree program), CNA(2 years diploma program), CMW(2 years diploma program) and LHV(2 years diploma program). Our study was focused undergraduate BSN students both annual and semester system.

4.4 Sampling:

4.4.1 Target population:

Our target population were students from BSN(4 year), CMW(2 year), CNA(2 year), LHV(2 year).

4.4.2 Study population:

Participants were nursing students enrolled in BSN (4year) from 2022 to 2027

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4.5 Sample Size:

The sample size is calculated manually by applying the Yamane method keeping the confidence interval 95% at margin of error equal to 7%:

$$\begin{aligned} n_{\text{Yamane}} &= N / (1 + Ne^2) \\ &= 281 / (1 + 281 (0.07)^2) \\ &= 281 / (1 + 281 (0.0036)) \\ &= 281 / (1 + 1.0116) \\ &= 281 / 2.0116 \end{aligned}$$

Total Population (N) = 281

Margin of error (e) = 7%

Sample size (n) = 139

In a 281 students population, the formula yielded a sample size of 139.

4.6 Sampling Technique:

We carried out stratified sampling technique with proportion allocation to select participants for the study.

4.7 Sampling

4.7.1 (a) Inclusion criteria:

The study included those:

- Have age 19-27 years old students were eligible.
- Both male and female both were included.
- Who are willing to give informed consent.
- Students from both annual and semester system included.

4.7.2 (b) Exclusion Criteria:

Exclusion criteria contains:

- Students those were on leave during period of data collection are in exclusion criteria.
- Nursing interns were excluded.
- Students in diploma programs were excluded.
- Students giving exams were excluded.

4.8 Experimental Work

4.8.1 Study Variables:

INDEPENDENT VARIABLE:

- E-cigarette

DEPENDENT VARIABLE:

- Knowledge
- Attitude
- practice

4.8.2 Data Collection Tools/Procedure:

1. DEMOGRAPHIC QUESTIONNAIRE:

The demographic questionnaire contains the data about age, gender, academic year, present residence, family type and parental smoking .

2. E-CIGARATTE QUESTIONNAIRE:

The proforma used for this research was obtained from a tool used in previous survey carried out in Nepal(2). We took permission from the author of the original study to use it . The tool-measuring knowledge and tool-measuring attitude had Cronbach's alphas of 0.66 and 0.68, respectively. Additionally, The supervisor's advice was followed in making the necessary adjustments and

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enhancements.(2)

The four sections of the questionnaire were "Socio demographic data" "Knowledge assessment about e-cigarettes" "attitudes" and "practice of e-cigarettes". Only those who answered "Yes" to the question were assessed in terms of their knowledge, attitudes, and practices. Only their socio demographic traits were inquired about by those who responded "No" to this question.

KNOWLEDGE: knowledge was assessed with 9 questions with the responses as "Yes", "No" and "Don't know". Each of the "yes" responses were given a score of 1, and answers with the "no" or 'I don't know' were assigned a score of 0. The sum of correct answers from each question yielded the knowledge level of the participants with a 9 maximum attainable score.

ATTITUDE: The participants' opinions toward e-cigarettes were measured in Part C using ten statements that were rated on a Likert scale.

It was ranged from "strongly disagree," "disagree," "neutral," "agree," "strongly agree," and "don't know" with 1 to 6 options. The answers were then reclassified as "1-disagree" for "strongly disagree and disagree" and "2-uncertain" for "neutral and don't know" and "3-agree" for "strongly agree and agree." The attitude score were calculated using the total of the agreed replies.

PRACTICE: Questions about e-cigarette use today made up Part D. In the first question, participants were asked if they had ever used an e-cigarette. If the respondent answered "yes," they received zero practice points; if they answered "no," they received one point. In this part, we also evaluated the respondents' reasons for using e-cigarettes, how they got their first e-cigarette, why they used e-cigarettes, and how often they used them.

4.8.3 Timeline:

Activity	Months					
	November	December	January	February	March	April
Topic Selection						
Synopsis Submission/Approval						
IRB Approval						
Data collection						
Data analysis and interpretation						
Thesis compilation						
Thesis presentation and submission						

4.8.4 Ethical Consideration:

Several steps were taken to protect the study participants.

- Written consent by the volunteer nursing student were also obtained.
- Personal communication with nursing students was done.

- All the questions were answered on the spot regarding the explanation of any question that were confusing to them.
- It was reassured to them that the data was used only for the research purpose and the information was kept confidential.
- All participants were informed that they may withdraw at any time and will not suffer any consequences.
- The purpose and benefits or contribution of the study were fully explained to all respondents and contact or approach were maintained in case any may be interested to know the study results.

4.9 Data Analysis

- The qualitative variables were analyzed with the help of frequency tables, bar charts, and the pie charts.
- The quantitative data was analyzed through mean, and standard deviation.
- Multiple logistic regression were used to check the relationship among the different factors regarding the knowledge, attitude and practice towards e-cigarettes.
- The chi-square test was used to check the association among different nominal variables (if any)
- The quantitative data was analyzed by using SPSS version 29 (statistical package of social science).
- A p value of equal or less than ≤ 0.05 was considered significant.

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CHAPTER 5

RESULTS

Table 5.1: sociodemographic data

Sociodemographic characteristics (n=139)	
CHARACTERISTICS	FREQUENCY(%)
age of respondent	
18-20	99(71.2%)
21-25	40(28.8%)
gender of respondent	
male	68(48.9%)
female	70(50.4%)
other	0(0.0%)
academic year of respondent	
1st year	96(69.1%)
2nd year	16(11.5%)
3rd year	16(11.5%)
4th year	11(7.9%)
family type of respondent	
nuclear	98(70.5%)
joint	30(21.6%)
extended	11(7.9%)
living style of respondent	
staying alone	28(20.1%)
staying with family	93(66.9%)
staying with friends	18(12.9%)

Table 5.1 outlines the sociodemographic characteristics of the study participants (N = 139). In terms of age distribution, the vast majority of the respondents fell within the 18–20 years age bracket (n = 99, 71.2%), while the remaining 28.8% (n = 40) belonged to the 21–25 years age group. While doing gender representation, the sample size size was almost equally divided, with females comprising 50.4% (n = 70) and males with the percentage 48.9% (n = 68) of the total population. While doing analysis of participants academic status, it revealed that majority of the sample was first year students (n = 96, 69.1%). In contrary to that, second-year and third-year students were almost 11.5% (n = 16) each, along with a smaller proportion of final-year students (n = 11, 7.9%). Furthermore, data concerning family structures indicated that most of the respondents belonged to nuclear families (n = 98, 70.5%), whereas 21.6% (n = 30) lived in joint families, and only 7.9% (n = 11) came from extended families. Lastly, regarding their current living arrangements, the majority of the respondents reported staying with their families (n = 93, 66.9%), while 20.1% (n = 28) were staying alone, and 12.9% (n = 18) lived with friends.

Table 5.2: knowledge related questions

Smoking-related characteristics and information about e-cigarettes	
Characteristics(n=139)	Frequency(%)
parental smoking	
yes	24(17.3%)
no	115(82.7%)
sibling smoking	
yes	9(6.5%)
no	130(93.5%)

Have you ever heard about e-cigarette?	
yes	111(79.9%)
no	27(19.4%)
i don't know	1(0.7%)
How do you know about e-cigarette?	
source of information	
Adverts for e-cigarettes in newspapers or Magazines	59(46.1%)
Adverts for e-cigarettes outdoors (e.g. posters, billboards, bus stops, etc)	83(64.8%)
E-cigarettes displayed for sale (e.g. in shops, shopping centers, stalls)	105(82.0%)
Videos and images of e-cigarettes (including adverts) on YouTube, Facebook, Tumblr, Snapchat	103(80.5%)
Famous people with e-cigarettes (e.g. in films, music, videos, on TV or pictured in magazines	106(82.8%)
Sports or live music events sponsored by e- cigarette brands	54(42.2%)
Others (specify).....	57(44.5%)

Table 5.2 presents the smoking-related characteristics and information awareness regarding e-cigarettes among the participants (N = 139). In terms of family smoking habits, the data revealed that a substantial majority of the respondents' parents do not smoke (n = 115, 82.7%), while 17.3% (n = 24) reported parental smoking. Similarly, sibling smoking was found to be very low, with 93.5% (n = 130) of the participants stating that their siblings do not smoke, compared to only 6.5% (n = 9) who reported affirmative.

Regarding personal awareness, a predominant majority of the respondents (n = 111, 79.9%) acknowledged that they had heard about e-cigarettes, whereas 19.4% (n = 27) had never heard of them, and a negligible 0.7% (n = 1) remained unsure.

Furthermore, the participants explained different sources from where they got information regarding e-cigarette. The most frequent source that participants chose were by watching actors or famous people with e-cigarettes in films, music, videos, or magazines (n = 106, 82.8%), along with seeing e-cigarettes displayed for sale in shops or shopping centers (n = 105, 82.0%). Additionally, a high number of participants get to know by social media through online videos and images on social media platforms like YouTube, Facebook, and Snapchat (n = 103, 80.5%). Advertisement such as posters and billboards, were noted by 64.8% (n = 83) of the sample. Other occasional sources of information included ads in newspapers or magazines (n = 59, 46.1%), sports or live music events sponsored by e-cigarette brands or companies (n = 54, 42.2%), and various other unknown sources (n = 57, 44.5%).

Table 5.3: Knowledge related questions

Statement	Yes (%)	No (%)	Don't Know (%)
E-cigarettes can contain nicotine.	110 (79.1%)	8 (5.8%)	21 (15.1%)
E-cigarettes are addictive.	121 (87.1%)	6 (4.3%)	12 (8.6%)
E-cigarettes are not harmful to health.	30 (21.7%)	96 (69.6%)	12 (8.7%)
Less harmful than normal cigarettes	62 (44.6%)	47 (33.8%)	30 (21.6%)
Cause of asthma attacks and allergies.	107 (77.0%)	12 (8.6%)	20 (14.4%)
Aware of government regulations in	48 (34.5%)	56 (40.3%)	35 (25.2%)

Pakistan.			
Can be used at smoke-free places.	45 (32.4%)	54 (38.8%)	39 (28.1%)

The analysis shows a relatively high level of awareness about the composition and nature of e-cigarettes. A significant number 87.1% of respondents acknowledged that e-cigarettes are addictive, while 79.1% are aware about nicotine as an ingredient in vapes. In addition, respiratory health awareness is also strong, with 77.0% accepting vaping as a potential risk and trigger for asthma and allergies.

However, after comparing the knowledge of all participants, although 69.6% rejected the statement that e-cigarettes are completely harmless, 44.6% still believe they are less harmful than traditional cigarettes. Moreover, only 27.3% knows and identify that e-cigarettes share similar chemicals as same as combustible cigarettes. Knowledge related to las andrules enforcemnet is also weak, as only 34.5% are aware of government regulations in Pakistan, and 32.4% misunderstood that vaping is legal and allowed in smoke-free areas.

Table5.4 : Attitude related responses

Attitude Statement	Strongly Agree (%)	Agree (%)	Neither (%)	Disagree (%)	Strongly Disagree (%)	Don't Know (%)
Using e-cigarettes is fun.	18 (12.9)	35 (25.2)	17 (12.2)	27 (19.4)	37 (26.6)	5 (3.6)
Adverts make it look cool	34 (24.5)	44 (31.7)	13 (9.4)	19 (13.7)	16 (11.5)	13 (9.4)
Has problem-solving effect.	13 (9.4)	18 (12.9)	29 (20.9)	33 (23.7)	39 (28.1)	7 (5.0)

Helps to cut down tobacco.	20 (14.4)	39 (28.1)	22 (15.8)	24 (17.3)	14 (10.1)	20 (14.4)
Relieves one's stress	26 (18.7)	35 (25.2)	29 (20.9)	19 (13.7)	14 (10.1)	16 (11.5)
Enhances performance.	12 (8.6)	19 (13.7)	27 (19.4)	26 (18.7)	34 (24.5)	21 (15.1)
Increases concentration.	15 (10.8)	20 (14.4)	26 (18.7)	31 (22.3)	20 (14.4)	27 (19.4)
Improves one's image.	6 (4.3)	14 (10.1)	22 (15.9)	40 (29.0)	43 (31.2)	13 (9.4)
Should be banned in Pakistan.	54 (38.8)	23 (16.5)	20 (14.4)	12 (8.6)	13 (9.4)	17 (12.2)
Makes someone look stylish.	21 (15.1)	18 (12.9)	25 (18.0)	30 (21.6)	35 (25.2)	9(6.5)

The study shows that advertisements have a huge influence on how students view e-cigarettes. Nearly 56.2% of the students agree that these ads either on social media platforms or on billboards, make vaping look cool, and 43.9% feels and accepts that it actually helps in reducing stress. However, most of the participants don't see it as a fashion statement, because 60.2% disagree with this thought that vaping improves someone's social image or reputation.

When participants were asked about action regarding policies making, most students show a very responsible approach toward public health. A significant majority of 55.3% clearly support a complete ban on e-cigarettes in Pakistan. This means that even though many students see vaping as attractive due to engaging ads or its stress-relieving claims, the majority still wants strict laws and allegations to stop its use.

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Table 5.5: Practices related responses

Variable	Categories	Frequency	Percentage (%)
Have you ever used e-cigarettes?	Never used	105	75.5%
	Tried once or twice	24	17.3%
	Daily user	8	5.8%
	Others/Uncoded (Codes 5, 9)	2	1.4%
First-time trigger/reason:	Saw a friend using it	30	21.6%
	Saw a family member using it	12	8.6%
	Saw celebs/famous people	5	3.6%
	Saw it displayed for sale	9	6.5%
	Just for curiosity/experiment	3	2.2%
	Other specific medical reasons (quit normal smoking)	5	3.6%
Current source of getting it:	Don't know / Non-users / Can't remember	75	54.0%
	From a friend	38	27.3%
	From a family member	4	2.9%
	Shop/Stall/Pharmacy/Internet	6	4.3%
Frequency of current usage:	Don't know / Others	91	65.5%
	Everyday	23	16.5%
	Often / Sometime	32	23.0%

	Never use / Others	84	60.4%
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The data regarding practices of e-cigarettes, shows that most of the students (75.5%) have never used an e-cigarette. In contrast to that, 17.3% of them have tried it once or twice just to check, and 5.8% say they are daily users. When we look at how often they use vapes, 16.5% use it every single day, while 23.0% use it rarely.

A significant sources of initiating this habit has been viewed is peer influence, the friends and mates usually effects the most to start this habit of vaping. Almost 21.6% of the students stated that they first felt the desire to try vaping after seeing a friend do it. Also, 27.3% of them got their very first e-cigarette directly from a close friend. This clearly represents that what starts as just fun or curiosity among friends probably turns into a regular habit for a lot of youngsters and adults.

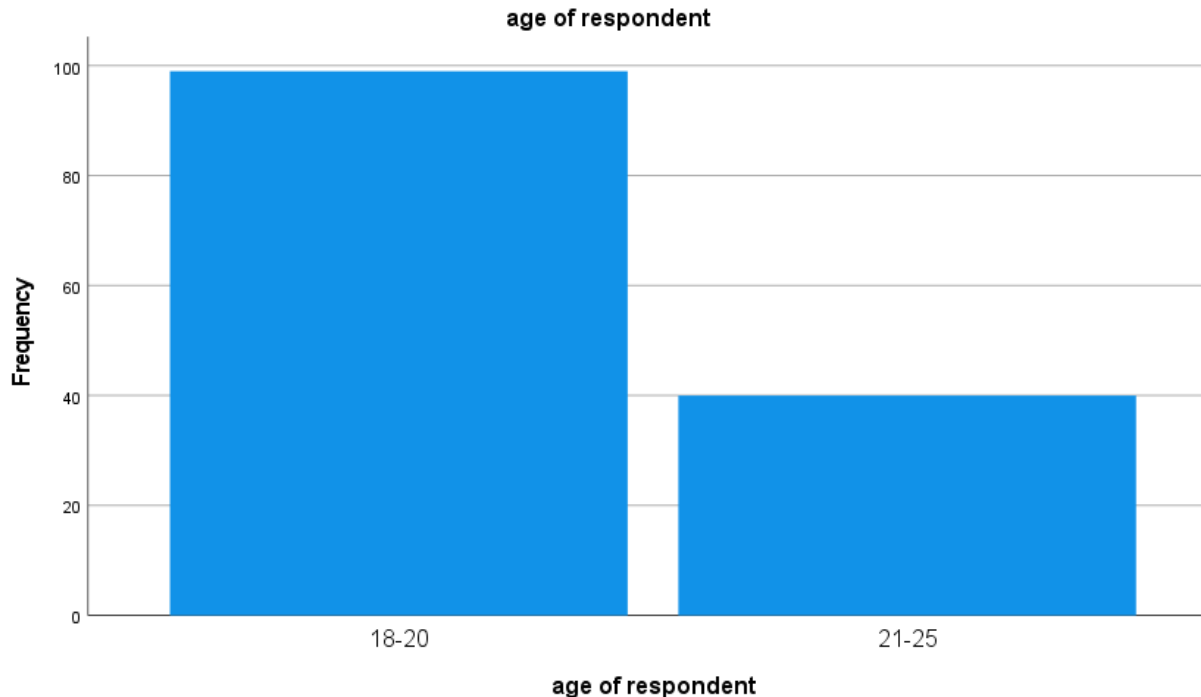


Figure 1: age of respondent

The bar chart visually represents the age distribution of the study participants. It is clearly visible that the bar representing the 18–20 age category is significantly higher over the 21–25 group, making a clear dominance of youngsters and adolescents in the student sample. This graphical representation highlights that our study is heavily focused on the perspectives of early college-going adolescents.

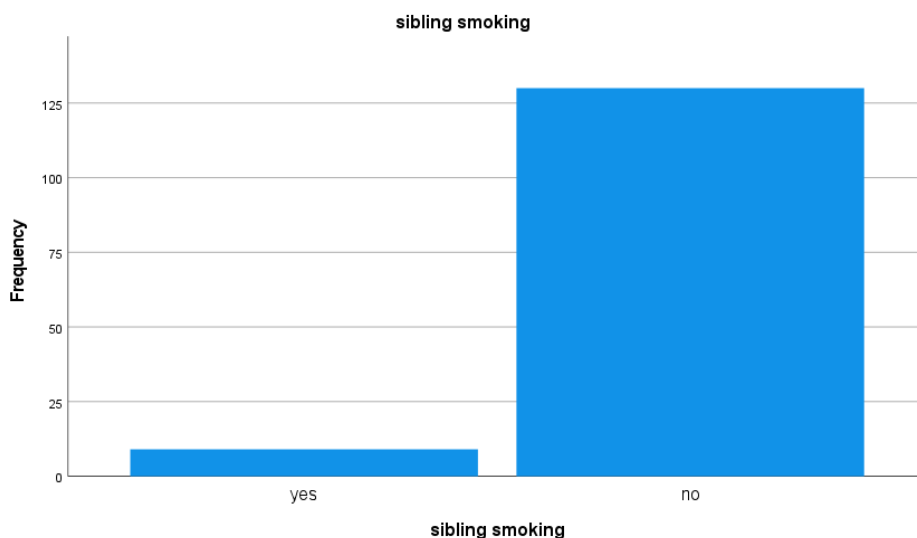


Figure 2: sibling smoking of respondent

This graphical representation bar charts shows the status of sibling smoking among the respondents. The extreme difference between the 'No' and 'Yes' bars instantly explains that the large majority of the students come from siblings who do not smoke. The little height of the 'Yes' bar visually confirms that sibling influence within the house is low among the study sample.

CHAPTER 6

DISCUSSION

Smoking is a serious issue that has been rising to an alarming level since a decade. Most common of that is; use of vapes specifically among youngsters, adolescents and adults probably university and college students. As it is crucial to identify the potential harmful effects of e-cigarette for all kind of students but medical students require proper training because their knowledge, attitude and practices will not only effect their own health but also influence patient health and well-being. Our objective is to identify the level of knowledge and awareness have among nursing students regarding e-cigarette because these students are future of healthcare, thus they will have great influence on patient.

When looking at the background of the students who took part in this survey, the most noticeable feature is how young the sample is with a massive 71.2% of the participants falling into the 18 to 20 years age bracket, which directly links to the fact that nearly 70% of the entire sample was made up of first-year students. This high proportion of first year students means our findings mostly reflect the point of view of young adolescents who are just entering into university life and are coming out of controlled home environments, though the gender division remains almost perfectly balanced with females at 50.4% and males at 48.9%, giving us a fair representation of view points from both sides. Moreover, the living style tell us about the social support system of these students, as almost 66.9% of them still live with their families and a huge majority (70.5%) come from nuclear households, which might explain why the they are less likely to get exposed to smoking as being reported, with only 17.3% of parents and an even smaller 6.5% of siblings smoking influence. But in contrast to that, some confounding factors could also be present such as the huge percentage of first-year students make up an academic confounder; the high level of awareness or trying vapes out of curiosity habits might just be driven by recent social media platforms and their sudden university life independence. In addition, on one side students from less parental and sibling smoking acts as a protection from exposure but on the other side external peer pressure(friends) strongly influence

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students habits, where 29.5% of students reported having friends who smoke, that shows it as a major confounding variable that likely lessen the impact of family rules and serves as the real driving factor behind a student's attitude and choice to try e-cigarette.

Our study result align closely with a recent cross-sectional study conducted by Kajan et al. (2025) among nursing students in Croatia in terms of demographic data, which also have a very young academic population highly consisted by first year undergraduates. Similarly our sample, 71.2% of participants were between 18 to 20 years old and 69.1% were in their first year of studies, their research highlighted that younger students fresh to the university environment are the most exposed to exploring modern smoking trends. However, a significant comparison could be seem in gender division as our study comprises with 50.4% females and 48.9% males, the Croatian study was overwhelmingly comprised of female nursing students it is often seen in European healthcare education. Regardless of this regional difference in gender ratios, both studies strongly agree on the reality that younger age and the starting years of university life acts as critical periods where students face a sudden change in social environments, that makes them the primary group adapting negative lifestyle habits like e-cigarette experimentation.

On the basis of practices and perception, our results show a very strong relation with the results of Pandey et al. (2024), who investigated e-cigarette trends among undergraduate medical students in Nepal. Our data revealed that regular, daily usage among our participants is quite rare at just 2.9%, with a major 75.5% part of the sample claiming they have never even tried a vape. The Nepal study reported a very similar findings, although students are not using e-cigarette on daily basis, yet there is a potential risk of starting the use of vape as influenced by the social circles. For example, within our sample, peer influence heavily show out as the primary trigger, where 21.6% of users accepted they started vaping because of their friends and 27.3% actually got their very first e-cigarette from a friend or a mate. This directly reflects the results from Nepal, where having close friends who vape was discovered as the single most powerful driving factor that leads students toward experimentation. These similar findings among students in two different countries demonstrates that even when

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youngsters have enough healthcare-related knowledge, their close friend and social environment and peer groups act as the final driving factor in whether they choose to experiment with modern smoking devices such as e-cigarette or not.

On the other hand, our study contradict to a Pakistani study conducted by Akhter et al. (2023) which was focused on practices and marketing perspectives among post-graduate medical trainees in our country. While our data represents that majority 56.2% of undergraduate nursing students believe that e-cigarette advertisements make vaping look "cool," and a significant number of students still have the misconception that vapes are less harmful than traditional cigarettes, in contrast to that the post-graduate trainees showed a significantly higher, more critical level of scientific knowledge. Their study reported that post graduate had a higher level of knowledge and awareness regarding harmful effects of long term electronic smoking devices usage and also they claimed to be uninfluenced by the social group pressures.

The justification to this dissimilarity among these two studies can be explained by the variance in their academic education and clinical experience level. The participants in the Akhter et al. study were post-graduate students who had got their basic training and also have clinical experience among pulmonology and cardiovascular patients thus they were seen to be more resistant to be influenced by peer and social environment. In contrary to that, our sample is heavily contained young, first-year nursing students (69.1%) who are just beginning their professional education and are coming into university life out of a highly vulnerable adolescent phase. Because our participants are younger and lack of detailed clinical exposure, they are naturally much more vulnerable to peer groups and trending media representations and advertisement, which justifies why their knowledge is still developing and their attitudes are significantly more affected by external marketing when compared to senior medical professionals and trainees.

The reason that our study is reliable because we used a validated questionnaire from our parent article in Nepal (Pandey et al., 2024), which was also used priorly in Singapore. This makes our result findings highly reliable and easy to compare internationally. But to generalize our findings could be

difficult because our sample comes from a single institution and mostly consists of first-year students, the results perfectly shows the knowledge and awareness level of new nursing undergraduates but might not apply to senior nurses across Pakistan. Regardless of that our research is significant because it shows where the knowledge gaps are, proving that we need to make proper policies and legislation in college and university and also must provide trainings and teaching right from the first year, before students start their hospital duties.

CHAPTER 7

7.1 RECOMMENDATIONS

- 1. Awareness Programs And Campaigns:** Institutes and universities should arrange awareness campaigns, programs and seminar to teach students about the harmful effects uof e-cigarette.
- 2. Strict Bans And Rules:** Having e-cigarette or vaping must be strictly ban among university or college building, classrooms and cafeteria along with punishments who will break these rules.
- 3. Peer Based Counseling:** There must be peer counseling programs among students and trained students should be allowed to talk to their fellows and friends to reist any negative habits in them.
- 4. Smoking Education in Curriculum:** The proper information, knowledge and data regarding nature, composition and harmful effects of modern smoking devices should be added in nursing and medical curriculum so that it provide a basis for coming students
- 5. Policies And Regulations:** Clear and specific information about current restrictions and bans on smoking must be displayed in institutes to aware everyone.
- 6. Mental Health Support:** As many users of e-cigarette believes it to be stress relieving thus there must be mental health counseling to provide better and healthier alternatives of reducing stress rather than this.
- 7. Bans On Adverts And Sales:** There must be strict and complete ban on trending media advertisement and restrictions on displaying it for sales in malls, stalls and shops or near educational institutions.

8. Arranging Extracurricular Activities: Universities must engage in sports, extracurricular activities and creative ideas to divert students' energy and curiosity to another channel rather than smoking experimentation.

9. Active Involvement of Parents: Educational institutions must arrange meetings with parents to aware them of modern smoking devices and to detect early signs and prevent it.

10. Further Research: researchers must further study on this topic on a large scale involving multiple institutes to have a detailed and comprehensive data regarding this issue.

7.2 LIMITATIONS

- **Small Sample Size:** we performed this study in a small sample size from a single institute thus our findings could not be generalizable to a whole population or different regions.
- **Majority Of First Year Participants:** A huge number of our respondents (69.1%) were first year students. Since the sample is heavily consisted of newcomers, the viewpoints and practices of senior students (like 3rd or 4th years) are not fully identified in the findings.
- **Possibility of Biasness:** As we know that vaping is considered to be a negative aspect in our society, and our study was a self-reported survey. Thus maybe students have not reported accurately regarding usage or of being hesitant about their practices and perceptions.
- **Missing Data and Variables:** As due to time shortage, during data analysis some data and variables regarding knowledge and practices could be missing. There is a lack of deep dive correlation among variables.
- **Cross-Sectional Design:** As our study design was cross-sectional, thus we collected data at a single point in time and have not tracked students' knowledge and practices over a longer period of time.
- **Data from a Single Institution:** As our data was collected from a single nursing institution thus our findings cannot be generalized among all nursing institutes or other university students.

- **Limited to Nursing Students Viewpoints:** As our study was based only on nursing students thus our results cannot be generalized of students from other fields such as business, agriculture, economics etc thus it is a limitation to our study.

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7.3 CONCLUSIONS

This study revealed although nursing students have basic knowledge and awareness regarding the nature and compositions of e-cigarette that they are addictive and contains nicotine yet significant misconceptions remains the same as they are seen to be safer than combustible smoking. Most students showed a highly responsible attitude toward healthier environment by supporting a complete ban on e-cigarettes in Pakistan. However, peer influence and social media advertisements continue to perform as powerful and potential triggers as it was witnessed by the people who tried just out of curiosity or those who are daily users. As these students are future healthcare professionals, it is crucial to address these knowledge gaps and social group influence through proper support and training, clear tobacco cessation policies, and updated healthcare education.

CHAPTER 8

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