

## Perception of Ain Shams University Students Related to Electronic Cigarette Smoking

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### Abstract

**Background:** Electronic cigarette smoking is gaining popularity and spreading among university students.. **Aim:** This study aimed to assess perception of Ain shams university students related to electronic- cigarette smoking. **Research design:** A descriptive analytical design was utilized. **Subject:** A convenient sample of 420 students from Ain shams university. **Setting:** The study was conducted in the academic structure of Ain shams university including 10 faculties in the main campus and 5 faculties along its extension including scientific and non -scientific faculties. **Data collection tools:** Two tools were used to conduct the study. **Tool 1)** Self- administered questionnaire which includes three parts. **Part I:** socio-demographic data of Ain shams university students, **Part II:** knowledge of Ain shams university students related to e-cigarette smoking, **Part III:** Reported practices of Ain shams university students related to e-cigarette smoking adapted from **Karasneh, et al, 2021.** **Tool 2)** Perception scale of Ain shams university students related to e-cigarette smoking adapted from **Karasneh, et al, 2021.** **Results:** 75.5% of Ain shams university students had unsatisfactory total knowledge score level about electronic cigarettes smoking, 81.3 % of them had harmful practices related to electronic cigarette smoking and 91.9 % of them had negative perception related to electronic smoking. **Conclusion:** There was a statistically insignificant relation exists between total knowledge of Ain shams university students and their age, gender and place of residence. While there was a statistically significant relation between perception of Ain shams university students and gender & type of faculty. There was a statistically insignificant relation between total perception of Ain shams university and their ages& place of residence.,Finally, there was a statistically insignificant relation between knowledge of Ain shams university students &their reported practices about electronic cigarette smoking. **Recommendations:** Raising up knowledge of university students about harmful effects of vaping. Further study to investigate harmful effects of electronic cigarettes smoking on health of university students.

**Keywords:** Perception, Electronic cigarette smoking, University students.

### Introduction:

Electronic cigarettes (e-cigarettes) are battery-powered devices in which a liquid, which may contain nicotine, propylene glycol, glycerin, flavors or other chemical additives, is heated and converted into an atomizer for inhalation, commonly called vapor. Electronic cigarette is the new style of portable, travel-friendly cigarettes. An electronic cigarette is easy to use with no setup required and completely electronic. Electronic cigarette offers the same quality smoke as regular cigarettes but with a futuristic twist driven by greater social acceptance, more positive taste experiences, and fashionable shape, compared

to the traditional smoking cigarettes (**Espinoza-Derout et al., 2022**)

Globally, electronic cigarette (e-cigarette) use has increased rapidly, particularly among teenagers and young adults who have never smoked. Over the past few years, e-cigarette use has become common among current smokers. E-cigarettes are delivered by an electronic device, which heats and aerosolizes a liquid solution of nicotine, propylene glycol, vegetable glycerin, and flavoring additives. E-cigarette manufacturers promote it as a safer and cheaper alternative to conventional cigarette smoking and the media play a major role in convincing people to

believe that e-cigarette is safer and cheaper than regular cigarette (**Al Rajeh et al., 2023**).

The World Health Organization (WHO) estimates that there are 1.1 billion smokers globally. There has been rapid uptake of e-cigarettes in some countries in Europe and in North America. In 2018, number of vapors 4.6 million in the south-East Asia region. In the UK the percentage of the adult population using e-cigarettes rose from 1.7% in 2012 to 7.1% in 2019. The prevalence of e-cigarettes in European countries varies between less than 0.2% and more than 7% (**Jerzynski et al., 2021**).

University student means a person enrolled in any College from age (18-22 years) for the purpose of entry in any course for acquiring any degree (**Gong & Pan, 2023**). University students are also a time if changing social relationships, expectations, role responsibilities they required especially attention and sustained support. In Egypt university students represent the largest segment of the population, according to survey conducted in Egypt state that 40% of Egyptians are University students (**Alamri, 2023**).

Perception is the collection of information obtained from external environments, the channels of perception are responsible for carrying out the action of research and organization of information, which contributes to the learning process. Channels reflect the way in which basic stimuli affect a person's ability to absorb and recall information. Perception is one of the important psychological aspects, because by it we know about phenomena which exists in our environment. It can be positive or negative (**Torbergsen et al., 2023**).

Many factors seem to have promoted electronic cigarette smoking, including social acceptance, less restrictions, accessibility, use of flavored aromatic tobacco, curiosity, peer pressure, fashion, higher socioeconomic status, and need for amusement. Majority of users believe in the "no or less harm" of e-cigarettes compared to tobacco cigarettes. Some users argue that they do not inhale the smoke (keep it

in the mouth cavity), therefore protecting themselves from nicotine absorption/addictive effects (**Nakkash & Khalil, 2020**).

Electronic cigarette smoking cannot be prevented only by increasing the knowledge about its dangers or consequences. Thus, one of the best ways to prevent the spread of electronic cigarette smoking is the inability to access the e-c smoking at home. In particular, families can be effective in preventing the entry of hookah into homes because family has large influence on the selection or exclusion of a healthy or social behavior. Some families are using electronic cigarettes smoking as a traditional entertainment (**Ahmed et al., 2022**).

The community health nurse works within three levels of prevention for improving health and healthy lifestyle, preventing disease, early detection and avoiding complication through health education for university students detailing the dangers of vaping, exercise and good nutrition, assessing awareness of university students, assess needs, supports them, identifies problems with them, help them to accept responsibility for maintaining their health and to make decisions into action, inspire them to make healthier choices, follow up, provide activities and assess the students ability to carry out the activities of daily living. Community health nurses offer education to students about maintaining their health. So, they can decrease the occurrence of diseases. They plan educational assemblies, conduct health screenings and referral. Community health nurse promote healthy lifestyle, prevent health problems, provide direct care, spiritual care and conduct research to improve awareness about hazard of electronic cigarette smoking. Community health nurses providing nursing care for university students complain from hazards of electronic cigarette smoking. (**Blume, 2020**).

### **Significance of Study:**

Vaping puts nicotine into the body and can slow brain development in youth, affect memory, concentration, learning, self-control, attention, mood and can lead to addiction of other types later in life. (**Ba-Break et al., 2021**).

Egypt is a developing country where electronic cigarettes consumption is steadily increasing through years and imposes public health burden. The number of Electronic cigarette smoking users has greatly increased in Egypt over the last decade (WHO, 2020). Last Egypt Survey, 2019 showed that (18.7%) of the Egyptians older than 18 years old are current electronic cigarette smokers (Atwa et al., 2019).

Nearly in Egypt, smokers are 17.3 percent of the total Egyptian population aged 15 and over, representing 18 million people, the smoking rate among students has increased recently, especially at the university level, as the latest reports indicated that the percentage of electronic smoking students in Egypt reached 24% of the total number of smokers of all ages. (Maziak et al., 2020).

**Aim of the study:**

The aim of this study was to assess perception of Ain shams university students related to electronic- cigarette smoking.

**Through:**

- 1-Assessing knowledge of Ain shams university students related to e-cigarette smoking.
- 2-Assessing reported practices of Ain shams university students related to e-cigarette smoking.
- 3-Assessing perception of Ain shams university students related to e-cigarette smoking.

**Research question:**

- Is there a relation between socio demographic characteristics of Ain shams university students and their knowledge a related to e-cigarette smoking?
- Is there relation between socio demographic characteristics of Ain shams university students and their perception?
- Is there a relation between knowledge and reported practices of Ain shams university students related to e-cigarette smoking?

**Subject and Methods**

This study was conducted under the four main designs as follows:

- I. Technical design
- II. Operational design
- III. Administrative design
- IV. Statistical design

**I-Technical design:**

The technical design include, research design, setting, subjects and tools for data collection.

**Research design:**

A descriptive analytical design was utilized in this study.

**Study Settings:**

The study was conducted in the academic structure of Ain shams university including all scientific and non -scientific faculties that including 10 faculties in the main campus in Abbassia such as faculty of nursing, faculty of medicine, faculty of pharmacy, faculty of dentistry, faculty of science, faculty of computer and information, faculty of Al- Alsun, faculty of commerce, faculty of low and faculty of arts and 5 faculties along its extension such as faculty of engineering, faculty of agriculture, faculty of girls, faculty of education, faculty of specific education.

**Subjects and sampling:**

**Sample type:** A convenient sample.

**Sample Size:** (420) students from all faculties of Ain shams university will be taken from total number (220614) with criteria of (male&female students from all academic structure in all faculties of Ain Shams University.

**According to the following equation:**

**With confidence level 96%**

$$n = \frac{\left(\frac{z}{d}\right)^2 \times (0.50)^2}{1 + \frac{1}{N} \left[\left(\frac{z}{d}\right)^2 \times (0.50)^2 - 1\right]}$$

n(sample size) = **420 student.**  
 z(The standard score) = **1.96**  
 d( absolute error rate) = **0.05**  
 N( size of population) = **220614**

#### Tools of data collection:

In order to collect the required data, the following tools were used.

##### **-First tool: Self- administered questionnaire**

This tool was designed by the investigator based on the recent literature review and experts' opinions and was written in Arabic language which includes three parts.

**Part I:** socio-demographic data of Ain shams university students such as (age, gender, marital status, place of residence, place of living, Number of family members, Monthly family income, personal expense, faculty data and history of smoking), questions No (1-18).

**Part II:** knowledge of Ain shams university students related to e-cigarette smoking adapted from **Karasneh, et al, 2021** and was modified by the investigator to meet the aim of the study. It included some of statements such as (Definition of e-cigarette, components, types, causes, carcinogenic substances in electronic cigarettes, harms (effects on mouth, human respiratory system- the heart & blood circulation, nervous system & brain, the eyes, human digestive system, long-term complications of vaping, ways of prevention & quitting of vaping, benefits and source of information about electronic cigarettes), questions No (19-35).

##### ❖ **Scoring system for knowledge:**

-Total knowledge questions composed of (17 questions). Each correct answer was scored one, and the incorrect answer and don't know were scored zero. Total score of total knowledge was 17. These scores were summed up and converted into a percent score.

**Statistically, it was classified into 2 categories:**

-Satisfactory knowledge if score was  $\geq 50\%$  representing (equal 9 degrees or more).

-Unsatisfactory knowledge if score was  $< 50\%$  representing (less than 9 degrees).

**Part III:** Reported practices of E-cigarettes smoking among Ain shams university students, adapted from **Karasneh et al., 2021** and was modified by the investigator to meet the aim of the study. It included some of statements such as (Duration of using e-cigarette, e-Cigarette Smoking Frequency, vaping outside, sharing the same vape with friends, vaping despite suffering from allergy, vaping because of tasting good, Type of juice & flavors, vaping to feel masculine, Increase juice(liquids) with vaping during anxiety and depression, Increase vaping during exams time to reduce stress, trying to stop vaping), questions No (1-11).

##### ❖ **Scoring system for reported practices:**

The reported practices questions include 11 negative statements, so the score of not done practice was scored two and the done practice was scored one. Total score of total reported practices was scored 22. These scores were summed up and converted into a percent score.

##### **Statistically, it was classified into 2 categories:**

-Not harmful practices if score was  $\geq 60\%$  representing (13 or less).

-Harmful practices if score was  $< 60\%$  representing (more than 13).

##### **Second tool: Perception scale of e-cigarettes smoking among Ain shams university students:**

This tool adapted from (**Karasneh, et al., 2021**) and was modified by the investigator to meet the aim of the study. The scale included some of statements such as (electronic smoking is less harmful than tobacco smoking, vaping is less common than tobacco smoking, vaping is an effective way to quit smoking, electronic smoking is less expensive than tobacco

smoking, electronic smoking is better in taste than tobacco smoking, electronic smoking is less addictive than tobacco smoking, electronic smoking helps to get rid of anxiety and stress, electronic smoking helps control appetite, electronic smoking helps in dealing with depression, vaping helps to increase concentration, electronic smoking increases the elegance of young people, vaping makes me at high risk to heart disease and lung cancer, electronic smoking expresses masculinity and supports personality, electronic smoking destroys life and leads to death, relatives are affected by passive smoking, questions No(1-15).

#### ❖ Scoring system for perception:

Total perception questions composed of (15 questions) the scale included three scale scores ranged from (agree=2, neutral=1, disagree=0). Total score of total perception was scored 30.

#### Statistically, it was classified into 2 categories:

- Positive perception if score was  $\geq 50$  % representing (15 or less).
- Negative perception if score was  $< 50$  % representing more than 15). The score was reversed for negative statements.

#### Tools validity and reliability:

##### Content validity:-

The content validity was done through a jury group consisting of five experts from community health nursing department, Faculty of Nursing, Ain shams university to test the study for clarity, relevance, understanding, comprehensiveness and applicability. The tool was modified and rephrased based on the jury's opinions. This phase took two weeks.

##### -Content reliability:

The content reliability was done by using Cronbach's alpha test which revealed that tool consisted of relatively homogenous items as

indicated by the medium to high reliability of each tool.

- Knowledge (.865)
- Reported practice (.963)
- Perception (.750).

By using Coronbach alpha test.

**-Operational design:** The operational design included a preparatory phase, ethical considerations, pilot study, and fieldwork.

##### -Preparatory phase:-

Preparatory phase was included reviewing national and international related literature and concerning the topic of the study covering various aspects of the study problem using books, magazines and internet in order to prepare the tool of data collection & theoretical part.

##### Ethical considerations:-

Official permission was obtained from the scientific Research, Ethical Committee, and Faculty of Nursing -Ain Shams University.

##### -The ethical research considerations include the following:

- The researcher met the students in the groups to explain the purpose of the study and to obtain their agreement to participate.
- Informal consent was obtained from students.
- Students was reassured about the anonymity of the information collected, that it was used only for scientific research, and their right to withdraw from the study at any time would be guaranteed.

##### Pilot study:

A pilot study was carried out after modifying the tools and before starting in data collection. It was conducted on (5%) of the total sample representing (21) in order to ensure the clarity and feasibility of the questions and the applicability of the tools and the time needed to complete the tool. No modifications were done

to the sample of pilot study, so it was included in the study.

#### **-Field work**

- After securing the official approvals for conducting the study.
- The investigator met the study sample inside their faculties to determine the suitable time for collecting data.
- Students were asked for an oral consent for participating in the study. --They were informed that their participation is completely voluntary.
- The investigator distributed the questionnaires in groups and ask study subjects to fill them.
- Questions were clearly explained in standard way to minimized errors in interviewing.
- Each interview took from 20-30 minutes. Then, the completed forms was checked for completeness.
- This study was done two days / weeks from 9 am-1 pm every Sunday and Wednesday of every week.
- Data was collected over a period of 2 months started (October 2022 and ended in December 2022).
- Anonymity of students, responses was guaranteed and confidentiality of data was maintained.

#### **Administrative design:**

An official letters was issued from the Faculty of Nursing, Ain- Shams University to get permission to collect the data. to get their consent and cooperation. An official letter from the dean of faculty of nursing Ain Shams University was forwarded to vice dean for post graduate studies for intended study setting. The purpose of the study and its procedures was explained to them.

#### **Statistical design:**

The collected data from university students were coded and entered in special format using Statistical software to be suitable for computer analysis.

- Following data entry, checking and verification process were carried out in order to avoid any errors.
- The following statistical package for Social Science SPSS (Version 23.0).

**Descriptive statistical measures**, which included numbers, percentages, and averages (Arithmetic mean, standard deviation (+ SD) for parametric numerical data. Chi-square(X<sup>2</sup>) and proportion probability of error (P value). Statistical analysis tests, chi square test to examine the relationship between two qualitative variables. The confidence interval was set to 95% and the margin of error accepted was set to 5 %. So, the P-Value were considered significant at the following:

- P <0.05 was considered significant.P <0.001 was considered as high significant
- P > 0.05 was considered insignificant.
- Graphic Presentation: included pie charts, column charts and bar graphs were used for data visualization.

#### **Study limitation:**

There was no limitation related to methodology during the current study.

#### **Results:**

**Table (1):** Reveals that, 50.2% of Ain shams university students their ages ranged from 21 or more years with a mean age 20.30±1.217. As for gender 73.1% of them were males. In relation to marital status 91.7% were single. Regarding place of residence 75.5% were from urban &84.3% live in their family homes. For number of family members 48.3% ranged from 3-less than 5 persons and 68.6% of their personal expense weren't enough as stated by them.

**Table (2):** Clarifies that 69% of Ain shams university students were from theoretical faculties &31% of them were in the fourth academic year.

**Table (3):** Demonstrates that 87.6 % of Ain shams university students had unsatisfactory knowledge score level about electronic cigarettes smoking. As for total knowledge about harms related to electronic cigarette smoking 80.5 % of them had unsatisfactory score level. Regarding total knowledge about avoidance of electronic

cigarette smoking 96.9% of them had unsatisfactory score level.

**Figure (1):** Illustrates that 75.5% of Ain shams university students had unsatisfactory total knowledge score level about electronic cigarettes smoking.

**Figure (2):** Shows that 81.3% of Ain shams university students had harmful practices related to electronic cigarette smoking.

**Figure (3):** shows that 91.9% of Ain shams university students had negative perception related to electronic smoking

**Table (4):** Represents that there is a statistically insignificant relation exists between total knowledge of Ain shams university students and their ages', gender, place of

residence and type of faculty with (p=0.692) (p=0.144) (p=0.646) (p=0.341) respectively.

**Table (5):** Reveals that there is a statistically significant relation between perception of Ain shams university students and gender, &type of faculty with (P=0.05\*) (p=0.005\*) respectively. A statistically insignificant relation exists between total perception of Ain shams university &their ages, and place of residence, with (p=0.469) (p=0.311) (p=0.342) respectively.

**Table (6):** Illustrates that there is a statistically insignificant relation between knowledge of Ain shams university students &their reported practice about electronic cigarette smoking with (p=0.220).

**Table (1):** Number and Percentage of Ain shams university students according to their sociodemographic data (n=420).

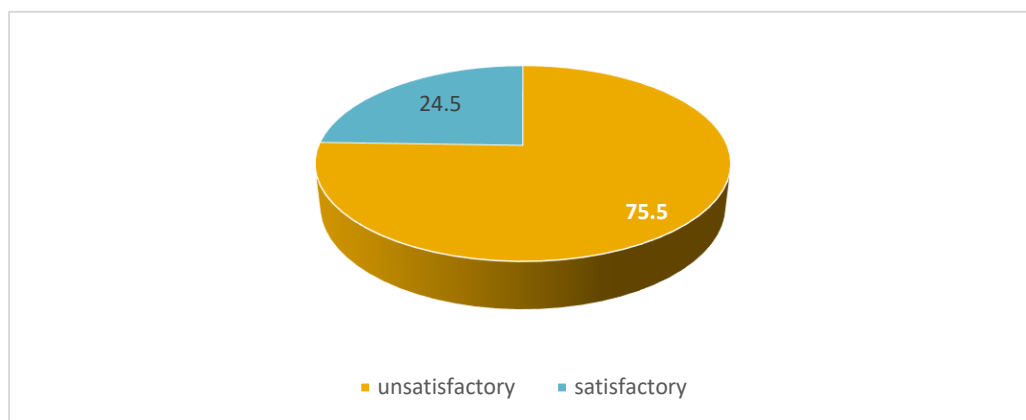
Sociodemographic data	No	%
<b>Age in years</b>		
≤20	209	49.8
≥21	211	50.2
<b>Mean &amp;SD 20.30±1.217</b>	20.30±1.217	
<b>Gender</b>		
Male	307	73.1
Female	113	26.9
<b>Marital status</b>		
Single	385	91.7
Married	35	8.3
<b>Place of residence</b>		
Urban	317	75.5
Rural	103	24.5
<b>Place of living</b>		
Family home	354	84.3
University home	42	10.0
Accommodation with colleagues	24	5.7
Separate housing	0	0.0
<b>Number of family members</b>		
3:<5 persons	203	48.3
5:<7 person	177	42.2
≥7 persons	40	9.5
<b>Monthly family income</b>		
Enough	170	40.5
not enough	250	59.5
<b>Personal expense</b>		
Enough	132	31.4
not enough	288	68.6

**Table (2):** Number and Percentage of Ain shams university students according to their faculty data (n=420).

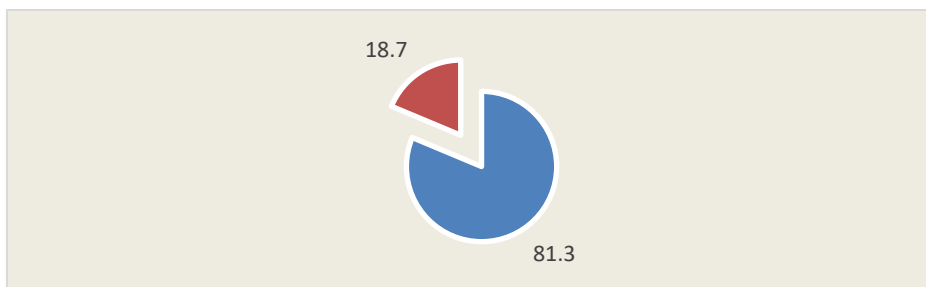
Faculty data	No	%
<b>Faculty Name</b>		
Nursing	17	4.0
Medicine	25	6.0
Dentistry	17	4.0
Pharmacy	20	4.9
Engineering	8	1.9
Science	3	.7
Computer and information	7	1.7
Agriculture	33	7.9
Al-Alsun	22	5.2
Commerce	76	18
Law	68	16.2
Girls	24	5.7
Education	28	6.7
Specific education	55	13.1
Arts	17	4.0
<b>Type of Faculty</b>		
Theoretical	290	<b>69.0</b>
Practical	130	31.0
<b>Academic year</b>		
First	74	17.5
Second	96	22.9
Third	120	28.6
Fourth	130	<b>31</b>

**Table (3):** Number and percentage of Studied students regarding Their total knowledge about electronic cigarette smoking (N=420).

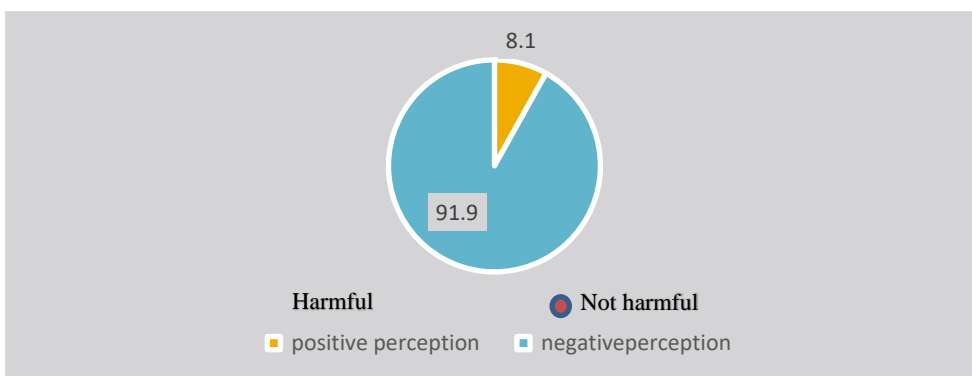
Knowledge Items	Satisfactory		Unsatisfactory	
	No	%	No	%
Total general knowledge about electronic cigarette smoking	52	12.4	368	<b>87.6</b>
Total knowledge about harms related to electronic cigarette smoking	82	19.5	338	<b>80.5</b>
Total knowledge about avoidance of electronic cigarette smoking	13	3.1	407	<b>96.9</b>

**Figure (1):** Percentage of Ain shams university students regarding their total knowledge score level about electronic cigarettes smoking (N=420).





**Figure (2):** Percentage of Ain shams university students regarding their total score level of reported practices related to electronic cigarettes smoking (N=171).



**Figure (3):** Number and percentage of Ain shams university students regarding their total perception related to electronic cigarettes smoking(N=420).

**Table (4):** Relation between sociodemographic characteristics of Ain shams university students and their knowledge about electronic cigarettes smoking related to research question NO 1 (n=420).

Demographic characteristics	Unsatisfactory Knowledge		Satisfactory Knowledge		$\chi^2$	P value
	No	%	No	%		
<b>Age in years</b>						
≤20	156	37.1	53	12.6	0.157	<b>0.692</b>
≥21	161	38.3	50	11.9		
<b>Gender</b>						
Male	226	53.8	81	19.3	2.31	<b>0.144</b>
Female	91	21.7	22	5.2		
<b>Marital status</b>						
Single	289	68.8	96	22.9	0.422	<b>0.516</b>
Married	28	6.7	7	1.7		
<b>Place of residence</b>						
Urban	241	57.4	76	18.1	0.211	<b>0.646</b>
Rural	76	18.1	27	6.4		
<b>Place of living</b>						
Family home	269	64	85	20.2	1.068	<b>0.586</b>
University home	32	7.6	10	2.4		
Accommodation with colleagues	16	3.8	8	1.9		
<b>Number of family members</b>						
3:<5 persons	151	36	52	12.4	0.677	<b>0.713</b>
5:<7 person	137	32.6	40	9.5		
≥7 persons	29	6.9	11	2.6		
<b>Monthly family income</b>						
enough	127	30.2	43	10.2	0.092	<b>0.762</b>
not enough	190	45.2	60	14.3		
<b>Personal expense</b>						
enough	101	24	31	7.4	0.112	<b>0.738</b>
not enough	216	51.4	72	17.1		
<b>Type of Faculty</b>						
Theoretical	215	51.2	75	17.9	0.907	<b>0.341</b>
Practical	102	24.3	28	6.7		

NS= statistically insignificant at p> 0.05 \*S= statistically significant at p≤ 0.05  
 \*\*HS= highly statistically significant at p≤ 0.001

**Table (5):** Relation between sociodemographic characteristics of Ain shams university students and their perception about electronic cigarettes smoking related to research question No 2 (n=420).

Demographic characteristics	Positive perception		Negative perception		$\chi^2$	P value
	No	%	No	%		
<b>Age in years</b>						
≤20	19	4.5	240	57.1	0.524	<b>0.469</b>
≥21	15	3.6	146	34.8		
<b>Gender</b>						
Female	24	5.7	205	48.8	3.85	<b>0.05*</b>
Male	10	2.4	181	43.1		
<b>Marital status</b>						
Single	29	6.9	350	83.3	1.027	<b>0.311</b>
Married	5	1.2	36	8.6		
<b>Place of residence</b>						
Urban	24	5.7	300	71.4	0.901	<b>0.342</b>
Rural	10	2.4	86	20.5		
<b>Place of living</b>						
Family home	26	6.2	344	81.9	7.27	<b>0.026*</b>
University home	7	1.7	28	6.7		
Accommodation with colleagues	1	0.2	14	3.3		
<b>Number of family members</b>						
3:<5 persons	20	4.8	218	51.9	0.084	<b>0.959</b>
5:<7 person	12	2.9	142	33.8		
≥7 persons	2	0.5	26	6.2		
<b>Monthly family income</b>						
enough	18	4.3	181	43.1	0.459	<b>0.498</b>
not enough	16	3.8	205	48.8		
<b>Personal expense</b>						
enough	17	4	125	29.8	4.33	<b>0.037*</b>
not enough	17	4	261	62.1		
<b>Type of Faculty</b>						
Theoretical	29	6.9	235	56	7.97	<b>0.005*</b>
Practical	5	1.2	151	36		

NS= statistically insignificant at  $p > 0.05$  \*S= statistically significant at  $p \leq 0.05$

\*\*HS= highly statistically significant at  $p \leq 0.001$

**Table (6):** Relation between Knowledge of Ain shams university students and their reported practice about electronic cigarettes smoking related to research question No 3 (n=171).

Knowledge	Not harmful practice		Harmful practice		$\chi^2$	P value
	No	%	No	%		
Unsatisfactory	103	60.2	27	15.8	1.506	<b>0.220</b>
Satisfactory	36	21.1	5	2.9		

## Discussion:

The rapid increase of battery-operated electronic cigarettes (also known as e-cigarettes) among the adolescent population has become an epidemic and a leading public health concern. Inhalation of the aerosol produced by e-cigarettes, also known as vaping, exposes university students to a variety of additives that include nicotine and other chemicals. Adolescents are especially vulnerable to the harmful effects of nicotine (Hwang & O'Neil2020).

The result of the current study revealed that more than half of university students aged from 21 or more with the mean  $20.30 \pm 1.217$  years and more than two thirds of USs were males. According to marital status, most of them were single (table 1). This result agrees with Manzoor et al., (2022) who conducted a study in Lahore among 160 students of multiple medical & non-medical colleges entitled "Vaping and Associated Health Problems in University Students" and found that 69.3% of them aged from 21-24 with the mean age  $19 \pm 3.31$  years. They also reported that 69.3 % of them were males.

At the same line, Kabbash et al., (2022) who conducted a study in Egypt among 368 students, entitled "The era of electronic smoking perception and use of E-cigarettes among university students" and found that 67.4% of them were males and 85.9 % of them were single.

From the investigator point of view, this might because male students are more interested in smoking and trying new trends, cultures in Egypt do not allow female to smoke, because they think that carrying cigarettes makes them appear more attractive and gives them a sense of independence, prestige. They are single. because most of them delay marriage after finishing their studying

Regarding place of residence about three quarters of USs were from urban area (table 1). The study is in contrast with Hafez et al., (2022) who conducted a study in Minia, Egypt among 714 students, entitled "Smoking

prevalence among university students" and found that 55.3% of them were from rural area.

In relation to their personal expense, more than two thirds of them weren't enough as stated by them (table 1). This result may be because of the high prices of transportation, and because they buy new clothes, a lot of books, food, and cigarette smoking also costs them a high cost. This result is congruent with the result of Wilson et al., (2019) who conducted a study in UK (United Kingdom) among 1720 participants entitled "Harm perceptions of e-cigarettes and other nicotine products sample" found only 40.1% have high personal expenses.

Concerning faculty type, more than two thirds of them were from theoretical faculties (table 2). This result is in agreement with Manzoor et al., (2022) who found that 63.13% of them were from non-medical colleges. Also, it is disagreed with Hafez et al., (2022) who found that 40.3% of them were from practical faculties.

From the investigator's point of view, this may be due to theoretical faculties students might have more spare time to socialize rather than practical faculties students who spend more time in their scientific studies.

Regarding to academic year, more than one quarter were in the fourth academic year (table 2). The findings is similar with Rodriguez, (2017) who conducted a study in Spain among 577 students, entitled "Perceptions and Use of the e-Cigarette among University Students" and found that 81.8% of them were in fourth academic year.

From the investigator's opinion, older students had more friendship & more peer pressure.

As regard to total general knowledge about electronic cigarette smoking, this study demonstrated that majority of university students had unsatisfactory knowledge score level (table 3). This result is in agreement with Abdel-Qader & Al Meslamani, (2021), who found that there is poor knowledge about the

content, regulations and types of e-cigarettes was reported among all students in his study.

According to total knowledge about harms related to electronic cigarette smoking, this study indicated that majority of them had unsatisfactory score level.

In relation to total knowledge about avoidance of electronic cigarette smoking, this study indicated that most of them had unsatisfactory score level. This result is matched with **Resano (2022)**, who reported that 80% of students had knowledge deficit about health harms related to e-cigarette smoking. It also is in disagreement with **Kristina et al., (2020)** who conducted a study in Indonesia among 930 students entitled "Trend of electronic cigarette use among students" and found that 64.57% of them had good total knowledge about harms of cigarette. It also in disagreement with **Manzoor et al., (2022)**, who found that students had incorrect knowledge about harmful effects of e-cigarettes.

From the investigator point of view, most university students don't participate in any health education program which lead to poor knowledge about harms related to electronic cigarette smoking.

As regard to total knowledge score level of Ain shams university students, the study result indicated that more than three quarters of them had unsatisfactory about electronic cigarettes smoking (**figure 1**). This result agrees with **Alhajj et al., (2022)** who conducted a study in Yemen among 1626 students entitled "Knowledge, beliefs, attitude, and practices of e-cigarette use among dental students" and found that most of students had unsatisfactory knowledge about e-cigarettes. It also in contrast with the study of **Shehata et al., (2020)**, who conducted a study in Saudi Arabia among 668 students entitled "Awareness, attitude, and practice regarding E-cigarettes among students at King Khalid University" illustrated that exactly 58.5% of students had good knowledge score level regarding e-cigarettes.

Regarding total score level of reported practices of Ain shams university student

related to electronic cigarettes smoking, this study showed that majority of Ain shams university students had harmful practices related to electronic cigarette smoking (**figure 3**). This result is in accordance with **Kurdi et al., (2021)** who reported that 78% of students had harmful practice related to e-cigarette smoking.

From the investigator point of view, the students had harmful practices related to electronic cigarette smoking, because most of the students did not participate in any program that raises awareness about the dangers of electronic cigarette smoking and its impact on health.

In relation to total perception of Ain shams university students related to electronic cigarettes smoking, this study showed that most of university students had negative perception related to electronic smoking (**figure 4**). This result is in agreement with **Wang et al., (2019)** who conducted a study in China among 10744 students entitled "perceptions and use of electronic cigarettes among young adults" and found that 50 % of students had negative perception about e-cigarette.

From the investigator point of view, this result because vaping is universally admirable. Opinions of vaping or negative impacts for social image is important for youth.

As regard to relation between sociodemographic characteristics of Ain shams university students and their knowledge about electronic cigarettes smoking, the current study represented that there was a statistically insignificant relation exists between total knowledge of Ain shams university students and their ages, gender, place of residence and type of faculty respectively in which  $p > 0.05$  (**table 4**). This result disagreed with **Cheah et al., (2019)** who conducted a study in Malaysia among 4176 students entitled "Sociodemographic differences in awareness of e-cigarette in Malaysia" and found that there was a significantly association between knowledge of students and their sociodemographic characteristics such as gender.

Additionally, for the relation between sociodemographic characteristics of Ain shams university students and their perception about electronic cigarettes smoking, this study revealed that there was a statistically significant relation between perception of Ain shams university students & gender, and type of faculty with respectively in which  $p \leq 0.05$  (table 5). This result is supported with **Al-Sawalha et al., (2021)** who found that there was a significant relation between perception of students and sociodemographic characteristics. Also, a statistically insignificant relation existed between total perception of Ain shams university & their age, and place of residence respectively in which  $p > 0.05$  (table 5).

Furthermore, the current study Illustrated that there was a statistically insignificant relation between knowledge of Ain shams university students & their reported practice about electronic cigarette smoking in which  $p > 0.05$  (table 6). This result is in contrast with **Kurdi et al., (2021)** who found that there was a statistically significant relation between Knowledge of university students and their use of electronic cigarettes.

From the investigator point of view, negative perception of university student lead to harmful practices related to electronic cigarette smoking.

### Conclusion:

More than three-quarters of Ain shams university students had unsatisfactory knowledge about electronic cigarette smoking. While the majority of them had harmful practices related to electronic cigarette smoking. Meanwhile, most of them had negative perceptions related to electronic smoking. While there was a statistically insignificant relation exists between the total knowledge of Ain shams university students and their sociodemographic characteristics. While there was a statistically significant relation between the perception of Ain shams university students and gender & type of faculty. Finally, there was a statistically insignificant relation between the knowledge of Ain shams university students & their reported practices about electronic cigarette smoking.

### Recommendations:

- Raising up the knowledge of university students about harmful effects of vaping through health education applied on regular basis through mass media & social media.
- Organization of periodic smoking cessation sessions & workshops inside the universities for all university students.
- Refer any students who indicate they use vape to smoking treatment resources..
- Further study should be replicated on a larger sample in other university setting to generalize the findings.
- Further study to investigate harmful effects of electronic cigarettes smoking on health of university students.

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