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PREVALENCE AND AWARENESS TOWARDS ELECTRONIC CIGARETTE (VAPE) SMOKING AMONG STUDENTS IN UNIVERSITY OF KERBALA

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ABSTRACT

Background: Tobacco smoking in particular ordinary and electronic cigarette or vaping has remained a major public health concern affecting young people across the globe. The emergence of vapes as an electronic cigarette has led to new trends in smoking behaviors including among the university students assuming that vapes are safer compared to smoking. **Objectives**: To measure the prevalence of electronic cigarette smoking among Karbala university students and assess students' knowledge about its health risks to establish preventive and control measures. **Methods**: A cross-sectional study conducted from March - May 2024, data collected from 500 students in colleges (dentistry, pharmacy, nursing, physical education, and engineering) at university of Karbala, by using self-administered questionnaire, analysis of data were done by Statistical Package for Social Sciences (SPSS), and Chi square test used to measure the associations between variables. **Results**: The results of the study showed that a total of 500 participants, 188 were smoking. Moreover, among (188) who smoke 75 participants (39.8%) currently smoke vape, (53.3%) of them were smoking vape daily. Electronic cigarette use was P. Value (0.001) associated with gender, among males (22.6%) of study participants, and family history of using electronic cigarette (24.4%) of study participants, about awareness of students 378 (75.6%) of them think that electronic cigarette was not safe, 271 (54.2%) of them think that electronic cigarette causes respiratory and cardiovascular diseases. A majority of non-smokers (81%) considered vape as addictive as tobacco. The highest proportion of electronic cigarette use was recorded in students who think that electronic cigarette is less dangerous than tobacco (18.3%). Awareness between medical and non-medical students about whether electronic cigarette causing respiratory and cardiovascular diseases, most of those with medical specialization (70.1%), (p=0.000) agreed, while about only (29.9%) of non- medical specialization agreed. **Conclusion**: The prevalence of electronic cigarette among Karbala university students was (15%).

KEYWORDS: Electronic cigar, smoking, vaping, karbalaa, Iraq.

INTRODUCTION

Tobacco is a major health issue which involves the use of cigarettes and also electronic cigarettes popularly referred to as e-cigarettes.[1] E-cigarettes does not involve burning of the tobacco like other ordinary cigarettes.[2] They employ the use of a heating mechanism that turns a liquid solution of the ingredients, flavors, nicotine, and other related chemicals into vapor. Nevertheless, e-cigarettes are much healthier than regular cigarettes as it is widely advertised and while using the e-cigarette, the users are still exposed to health risks through the use of vaporized chemicals.[3]

Electronic cigarettes have emerged as popular nicotine delivery devices across the globe: e-cigarette is a fast growing multi-billion-dollar market. E-cigarettes are typically battery-operated devices that convert a liquid known as "e-liquid" or "vape juice" to an aerosol commonly referred to as "vapor." These e-liquids contain nicotine at different levels of concentration alongside flavors, propylene glycol, glycerin and other chemicals. While some e-liquids are labelled as non-nicotine products, researches have discovered that they may contain small degree nicotine together with other harmful chemicals.[4][5] Although some data that claim that the levels of toxic chemicals produced from e-cigarettes are lower compared to combustible tobacco[6], other contentious issues concerning its adverse health effects besides nicotine addiction are yet to be addressed. By the end of 2021, it had been estimated that 82 million people are using e-cigarettes across the world, which is a significant increase from previous years.[7] In the Middle

East and Iraq especially, vaping is well known but still quite young market although it has been experiencing steady growth and especially among the young people. It is established that smoking hookah or waterpipe has been traditional and part of the cultural and social activities in the region whereas e-cigarettes come as modern technology.[7] However, until recently, there is still scanty information concerning the use of vaping and the rate of awareness and knowledge on the effects of vaping on health in many regions of the Arab world including Iraq.[8] This study aims to measure the prevalence of electronic cigarette smoking among Karbala university students, assess students' awareness about electronic cigarette health impacts and identify the factors that influence students' decisions to use electronic cigarette smoking.

METHOD
This research utilizes a cross-sectional research design which seeks to determine the level of awareness towards electronic cigarette (vape) smoking among the student population of the University of Karbala. The study was conducted in five randomly selected colleges in university of Karbala three of which are medical colleges (dentistry, pharmacy, nursing), two are non-medical colleges (physical education, engineering). Data was collected through questionnaires which were administered over a period of two month (from first of March to the first of May 2024). A convenient sample size of 500 students, both males and females were included in this study.

Inclusion Criteria
- Young people between the age of 18 to 25 years who are studying in any of the five chosen colleges in the university.
- While selecting the samples, gender was not taken into consideration so as to include both males and females evenly.

Exclusion Criteria
- Respondents, that have not filled in all the questions.
- Those who refused to answer during the completion of the questionnaire.

This study was approved by the Iraqi Ministry of Health and the Arab Board of Health Specialization. Each of the students was informed about the details of the study before the actual exercise was conducted. This study on the prevalence and awareness of electronic cigarette (vape) smoking among students at the University of Karbala revolves around three key sections.[9]

The First Section: consist of eight questions about demographic information about Age, sex, the academic specialization, residency, income, family and friends' history of smoking.

The Second Section: consist of seven questions about practice of smoking, type of tobacco product, and pattern of smoking (daily, occasionally), (less than year, more than year) and the satisfaction and motivation for its use.

Third section: consist of four questions about the awareness towards the risks that are associated with electronic cigarette smoking. The questions in this section were

Participants were asked how they perceived the health risks associated with vaping, with 4 possible responses categorized as follow: (absolutely safe, unsafe but less dangerous than tobacco, unsafe and more dangerous, not sure).the second and third questions about whether it causes diseases and whether it's considered as a good way to quit smoking respectively, with 3 responses categorized as : (yes, no, not sure), and the last question was about addictive nature of electronic cigarettes, with 4 responses (electronic cigarette is addictive as tobacco, less than tobacco, not addictive, not sure).

Descriptive analysis for categorical variables was performed by using frequency tables and percentages while data were analyzed by using Statistical Package for Social Sciences version 24. To check correlation between two variables the Chi-square test was employed with the acceptable level of p value < (0.05) considered statistically significant.

RESULTS
The study participants consisted of 500 students, the results presented in table (1) show that 52.2% of the participants aged 18-21 years. Males comprised 65.4% of the sample. The majority (91.6%) of them resided with their families, and 8.4% lived in university internal housing department. Regarding income, 7.8% reported weak income, 58.2% moderate, and 34.0% good. Among the respondents, 59.0% had no family members using electronic cigarettes (Vape), while 41.0% did. Additionally, 44.4% reported no friends using vape, whereas 55.6% had friends who did. When asked about their smoking habits, 59.4% of the participants did not smoke, 3.0% were previous smokers, and 37.6% were current smokers.

Table 1: Demographic information of the participants.

Variables	Characteristics	N	Percentage
Age	18-21 years	261	52.2
	22-25 years	232	46.4
	More than 25 years	7	1.4
Sex	Male	327	65.4
	Female	173	34.6
Residence	With family	458	91.6
	Students residency	42	8.4
Income	Weak	39	7.8
	Moderate	291	58.2
	Good	170	34.0
College	Nursing	100	20.0
	Dentistry	100	20.0
	Physical education	100	20.0
	Engineering	100	20.0
	Pharmacy	100	20.0
Is there any one of the family members using e-cigarette smoking (vape)?	No	295	59.0
	Yes	205	41.0
Is there any of your friends using e-cigarette smoking (vape)?	No	222	44.4
	Yes	278	55.6
Do you smoke any type of smoking (vape, tobacco, hookah, mixed)?	No	297	59.4
	Previously	15	3.0
	Yes	188	37.6

Table (2) show that among smoking participants (39.8%) currently smoke vape, while 113 participants (60.2%) prefer tobacco, hookah, or a mix. Of those who smoke vapes, 53.3% smoking daily and 46.7% occasionally. Regarding smoking duration, 38.7% have smoked for less than a year, while 61.3% have smoked for more than a year. After switching to vape, 34.7% continued traditional smoking, 42.7% never tried it, and 22.7% quit. In terms of satisfaction, 41.3% have not tried traditional smoking, 30.7% find vape less satisfying, 17.3% feel the same, and 10.7% are more satisfied. A personal decision led 65.3% to start vaping, with friends influencing 25.3%, family 6.7%, and popular figures 2.7%. Motivations for vaping include it being less dangerous than cigarettes (32.0%), a way to quit smoking (17.3%), ease of use (6.7%), and other reasons like curiosity and pleasure (41.3%).

In terms of comparing vape users (n=75) and other type smokers (n=113), the results presented in table (3) show that males (p=0.001) had a higher prevalence of vape use (22.6%) compared to females (0.6%). Age (p=0.864) did not show a strong association with vape use. Those living with their family were more likely to use vape compared to those in university housing (p=0.002). Income level was not significantly related to vape use (p=0.098). However, there was a statically increase in the vape use. The results reveal that college affiliation (p=0.001) played a significant role in vape use. Students from physical education (22%) and pharmacy (17%) had higher rates of vape use compared to those in dentistry (12%), nursing (12%), and engineering (12%). Also, the results showed that a family history of vaping use

(p=0.001) and friends' history (p=0.038) also significantly increased the proportion of vape use.

Table (4) shows that Among vape users, most of them (52%) view vaping as less dangerous than traditional tobacco, while a statically significant portion of non-smokers (77.7%) perceive it as more harmful, indicating a difference in risk perception based on smoking behavior(p=0.001). Most nonsmokers (72.3%) were aware of the respiratory and cardiovascular risks of vaping, whereas vape users showed less awareness. Opinions on whether vaping is an effective smoking cessation tool did not significantly differ among groups (p=0.357). However, there was a notable contrast in views on addiction: the majority of non-smokers (81%) considered vape as addictive as tobacco, while a sizable portion of users (32.5%) believed they were nonaddictive, showing a substantial statically significant divide in understanding the addictive nature of vaping (p=0.001).

Table 2: Smoking habits and preferences among electronic cigarette smokers.

Variables	Characteristics	N	Percentage
N =188			
If you are smoker, what type of smoking currently?	Electronic cigarette (vape)	75	39.8
	Tobacco, hookah, mixed	113	60.2
	Tobacco	**81**	**43.1**
	hookah	32	17
N=75			
Do you smoke vape at present time?	Daily	40	53.3
	Occasionally	35	46.7
Duration of smoking?	Less than year	29	38.7
	More than year	46	61.3
Did you stop using traditional methods of smoking (tobacco, hookah) after switching to electronic cigarettes?	No	26	34.7
	I have not tried traditional smoking	32	42.7
	Yes	17	22.7
What is the Degree of satisfaction with an electronic cigarette (vape) compared to traditional smoking (tobacco, hookah)	I have not tried traditional smoking	31	41.3
	Less satisfaction	23	30.7
	Same	13	17.3
	More satisfaction	8	10.7
Is there someone who pushed you to smoke an electronic cigarette (vape)?	A friend	19	25.3
	A family member	5	6.7
	Personal decision	49	65.3
	Popular figure	2	2.7
Motivation to use electronic cigarette (vape)?	Less dangerous than cigarette (tobacco)	24	32.0
	Cheaper than cigarette (tobacco)	2	2.7
	Easy to use	5	6.7
	A way to quit smoking	13	17.3
	Other (curiosity, pleasure ....)	31	41.3

Table 3: Factors associated with E-cigarette use.

Parameter	Category	E- cigarette use n=75	Tobacco, hookah or mixed-use n=113	Nonsmokers n=313	Total 500	χ^2	p
Gender	Male	74 (%22.6)	111 (%33.9)	142 (%43.4)	327	145.03	0.001
	Female	1 (%0.6)	2 (%1.2)	170 (%98.3)	173		
Age	18-21 years	35 (%13.4)	59 (%22.6)	167 (%64)	261	1.297	0.864
	22-25 years	39 (%16.8)	52 (%22.4)	141 (%60.8)	232		
	More than 25 years	1 (%14.3)	2 (%28.6)	4 (%57.1)	7		
Residence	With family	71 (%15.5)	111 (%24.2)	276 (%60.3)	458	11.366	0.002
	University housing	4 (%9.5)	2 (%4.8)	36 (%85.7)	42		
Income	Weak	3 (%7.7)	16 (%41)	20 (%51.3)	39	7.735	0.098
	Moderate	45 (%15.5)	62 (%21.3)	184 (%63.2)	291		
	Good	27 (%15.9)	35 (%20.6)	108 (%63.5)	170		
College	Nursing	12 (%12)	27 (%27)	61 (%61)	100	43.43	0.001
	Dentistry	12 (%12)	13 (%13)	75 (%75)	100		
	Physical education	22 (%22)	40 (%40)	38 (%38)	100		
	Engineering	12 (%12)	22 (%22)	66 (%66)	100		
	Pharmacy	17 (%17)	11 (%11)	72 (%72)	100		
Specialization	Medical	41 (%13.7)	51 (%17)	208 (%69.3)	300	17.07	0.001
	Nonmedical	34 (%17)	62 (%31)	104 (%52)	200		
Family history of using electronic cigarette	Positive	50 (%24.4)	51 (%24.9)	104 (%50.7)	205	28.80	0.001
	Negative	25 (%8.5)	62 (%21)	208 (%70.5)	295		
Friends' history of using electronic cigarette	Positive	51 (%18.3)	65 (%23.4)	162 (%58.3)	278	6.54	0.038
	Negative	24 (%10.8)	48 (%21.6)	150 (%67.6)	222		

Table 4: Association between electronic cigarette smoking and awareness of students.

Parameter	Characteristics	E-cigarette use n=75	Tobacco, hookah or mixed-use n=113	Nonsmokers n=313	Total 500	χ2	p
Do you think that smoking electronic cigarettes (vaping) is considered safe?	Not sure	11 (%12.8)	15 (%17.4)	60 (%69.8)	86	33.21	0.001
	Absolutely safe	3 (%8.3)	19 (%52.8)	14 (%38.9)	36		
	Unsafe, but less dangerous than tobacco	52 (%18.3)	67 (%23.6)	165 (%58.1)	284		
	Unsafe, and more dangerous than tobacco	9 (%9.6)	12 (%12.8)	73 (%77.7)	94		
Do you think that smoking electronic cigarettes (vaping) causes respiratory diseases and cardiovascular diseases?	No	23 (%28.7)	32 (%40)	25 (%31.3)	80	44.82	0.001
	Not sure	22 (%14.8)	36 (%24.2)	91 (%61.1)	149		
	Yes	30 (%11.1)	45 (%16.6)	196 (%72.3)	271		
Do you think smoking electronic cigarettes (vaping) is an effective way to stop smoking?	No	30 (%12.9)	61 (%26.2)	142 (%60.9)	233	4.39	0.357
	Not sure	29 (%17.8)	30 (%18.4)	104 (%63.8)	163		
	Yes	16 (%15.4)	22 (%21.2)	66 (%63.5)	104		
Do you think that smoking electronic cigarettes (vaping) causes addiction?	Not sure	15 (%12.3)	35 (%28.7)	72 (%59)	122	57.73	0.001
	Electronic cigarette is addictive as tobacco cigarette	11 (%8.7)	13 (%10.3)	102 (%81)	126		
	Electronic cigarette is addictive but less than tobacco cigarette	11 (%8.1)	37 (%27.4)	87 (%64.4)	135		
	Electronic cigarette is not addictive	38 (%32.5)	28 (%23.9)	51 (%43.6)	117		

Among 300 individuals with medical specialization and 200 with non-medical specialization, perceptions about vape safety and effects varied significantly. The results presented in table (5) show that regarding whether vaping is considered safe, both groups were evenly split on uncertainty (50%) more frequently viewed it as absolutely safe (61.1%) compared to those with medical specialization (38.9%), but those with non-medical specialization (p=0.003). On the question of vaping causing respiratory and cardiovascular diseases, most of those with medical specialization (70.1%), (p=0.000) agreed, while about 1/3 of non- medical specialization agreed, with a highly significant difference. Opinions on whether vaping is an effective smoking cessation tool showed no significant difference (p=0.630) between the two groups. Lastly, regarding vaping's potential for addiction, there was no significant difference in perceptions of (electronic cigarette is addictive as tobacco cigarette) in both groups p=0.161.

Table 5: Awareness of electronic cigarette (vaping) among Medical and Non-Medical students.

Parameter	Characteristics	Medical specialization n=300	None-Medical specialization n=200	Total 500	χ2	p
Do you think that smoking electronic cigarettes (vaping) is considered safe?	Not sure	43 (50%)	43 (50%)	86	13.855	0.003
	Absolutely safe	14 (38.9%)	22 (61.1%)	36		
	Unsafe, but less dangerous than tobacco	186 (65.5%)	98 (34.5%)	284		
	Unsafe, and more dangerous than tobacco	57 (60.6%)	37 (39.4%)	94		
Do you think that smoking electronic cigarettes (vaping) causes respiratory diseases and cardiovascular diseases?	No	32 (40%)	48 (60%)	80	28.511	0.000
	Not sure	78 (52.3%)	71 (47.7%)	149		
	Yes	190 (70.1%)	81 (29.9%)	271		
Do you think smoking electronic cigarettes (vaping) is an effective way to stop smoking?	No	139 (59.7%)	94 (40.3%)	233	0.926	0.630
	Not sure	102 (62.6%)	61 (37.4%)	163		
	Yes	59 (56.7%)	45 (43.3%)	104		
Do you think that smoking electronic cigarettes (vaping) causes addiction?	Not sure	79 (62.3%)	46 (37.7%)	125	5.149	0.161
	Electronic cigarette is addictive as tobacco cigarette	77 (61.1%)	49 (38.9%)	126		
	Electronic cigarette is addictive but less than tobacco cigarette	87 (64.4%)	48 (35.6%)	135		
	Electronic cigarette is not addictive	60 (51.3%)	57 (48.7%)	117		

DISCUSSION

In this study if taking into consideration that among the total 500 participants there is 75 participants (15%) smoking vape, these findings considered relatively similar to the findings of Previous studies that reported the prevalence of vaping among college students in Baghdad, Iraq (13.5 %)[9], the Kurdistan Region, Iraq (15.7 %)[10], Qatar (14 %)[11], US (14.9%)[12], and relatively less than the results in KSA (24%)[13], and Palestine (19.7%).[14]

The results showed that among the students who used vapes (75 students), a notable 53.3% reported using them daily, suggesting a habitual pattern of use. Furthermore, 61.3% of these daily vapers had been using vape for over a year, may indicate that vaping is not just a temporary trend but potentially a long-term alternative to smoking for many students. These findings are relatively consistent with previous study conducted in Baghdad, Iraq[9] that showing (64.3%) using e-cigarette daily, and study in UAE (67.4%).[15] Despite the switch to vaping, a significant portion of users (34.7%) continued to smoke traditional tobacco products alongside vapes, highlighting a pattern of dual use. On the other hand, 22.7% of the participants reported that they had completely quit traditional smoking after switching to vapes, indicating that vaping may serve as a successful cessation tool for some. The study also explored the satisfaction levels among the students. Interestingly, 41.3% of the participants who used vapes had never tried traditional smoking, may suggest that for a portion of the vaping population, it may serve as an entry point to nicotine use. However, only 10.7% of the students found vaping to be more satisfying than traditional smoking,

reflecting a potential preference for the sensory experience or nicotine delivery of conventional cigarettes.

When examining the motivations behind vaping, the study found that personal decision-making played the most significant role, with 65.3% of vapers stating that their choice to start using vapes was self-driven. Perceived safety was a key factor for 32.0% of users, as many viewed vaping as a less harmful alternative to traditional smoking, while (17.3%) used vape as a way to quit smoking, Curiosity and pleasure also played a significant role, with 41.3% of participants admitting that they started vaping simply to try something new and enjoy the flavor of it. These findings are relatively consistent with previous studies conducted in Baghdad, Iraq[9] that showing (50%) used for pleasure and (20%) used in order to quit smoking, and study conducted in KSA[13] That showing (51%) uses e-cigarette just to enjoy flavor of it, and UAE (36.1 %).[15] These studies showed that participants started vaping believing that e-cigarettes are less harmful than traditional smoking.

The data indicates a pronounced gender disparity in vape use, with males showing a markedly higher rate of usage compared to females. This significant difference underscores a potential gender-related preference or behavioral pattern in vaping consumption. These results are consistent with previous study conducted in KSA (1.1%)[13], Malaysia (2.5%)[16], in Baghdad, Iraq (1.3%)[9], but lower than rate in the UAE (8%).[15] Those residing with family members displaying a higher likelihood of using vapes compared to students living in

university-managed housing. These findings align with previous research conducted in Baghdad, Iraq.[9]

Students in (physical education and pharmacy) reporting higher rates of vape use compared to those in (nursing, dentistry and engineering disciplines). This variation may reflect differences in academic environments, stress levels, or peer influences associated with different fields of study. These findings are consistent with previous studies conducted in Palestine[17] and China.[18]

Students with family members who use vape are more likely to adopt this behavior, additionally, the study found that a history of vape use among friends also impact an individual's likelihood of using vape. These results are consistent with earlier researches conducted in countries such as Baghdad, Iraq[9], Palestine[14], and Qatar.[11]

Over a half of the respondents (54.2%) recognize the potential for vaping to cause serious health issues, particularly respiratory and cardiovascular diseases, this relatively similar to study in Palestine[14] and Qatar[11] that showing about one half of students are aware of vape health risks, but less than the perception rate of studies conducted in Baghdad, Iraq[9] (about 2 thirds) and Kurdistan, Iraq (78%)[10] and Malaysia (69%)[37] a majority of the students that acknowledged vape causing diseases were nonsmokers (72.3%) There is a distinct difference in perceptions of vaping risks and health consequences between vape users and non-smokers. Among vape users, a significant portion views vaping as less dangerous than traditional tobacco, suggesting a tendency to downplay the potential harms, about one half of all students hold the belief that vaping is less harmful than traditional smoking and this rate slightly more than the rate recorded in study conducted in Baghdad, Iraq (40%)[9], Qatar (41%)[11] Which aligns with the widespread marketing narrative that vaping offers a "safer" alternative to cigarettes.

The results show that regarding whether vaping is considered safe, both groups were evenly split on uncertainty (50%), but those with non-medical specialization more frequently viewed it as absolutely safe (61%) compared to those with medical specialization (38.9%). Interestingly, despite the variations in opinions about safety and disease risks, both medical and non-medical students had similar views on vaping's potential as a tool for quitting smoking, This is also reported in many studies, Jordan[19], KSA[20] that showed that medical students are more cautious about vaping health risks, and not consistent with study in KSA.[21]

CONCLUSION
About 188 were smoking. Moreover among (188) who smoke (75 participants) 39.8% currently smoke electronic cigarettes (vapes), while (113 participants) 60.2% prefer tobacco, hookah, or a mix. A majority of

vape users (53.3%) used e-cigarettes daily, and while some continued traditional smoking, others quit. Students' perceptions of vaping varied, with mixed opinions on its safety and addictive potential. e-cigarette use was more prevalent among males, students living with family, and those in fields like physical education and pharmacy. Social factors, such as family and friends' history of e-cigarette use, significantly increased the likelihood of use. E-cigarette users tend to underestimate the risks of vaping compared to non-smokers, who are more aware of its health dangers. While opinions on vaping as a smoking cessation tool were mixed, there was a clear divide in views on addiction, with non-smokers largely recognizing its addictive potential, unlike many users. The study revealed that individuals with medical specialization were more likely to associate vaping with health risks compared to those with non-medical specialization, who were more inclined to view it as safe. Both groups showed no significant differences in perceptions of vaping's effectiveness for smoking cessation or its addictiveness compared to tobacco.

REFERENCES
1. Jha P. The hazards of smoking and the benefits of cessation: a critical summation of the epidemiological evidence in high-income countries. elife., 2020; 9: e49979.
2. KOZAK K. E-Cigarettes. The Assessment and Treatment of Addiction: Best Practices and New Frontiers. Published online, 2018; 43.
3. Patric M, Laura P, et al. An adapted overview of e-cigarette impact on human health, Respiratory research, 2021; 22(1): 151.
4. Sleiman M, Logue JM, Montesinos VN, et al. Emissions from Electronic Cigarettes: Key Parameters Affecting the Release of Harmful Chemicals. Environ Sci Technol., 2016; 50(17): 9644-9651. doi: 10.1021/acs.est.6b01741.
5. Alshareef HZ, Omaye ST. Toxicology of commonly found ingredients in e-cigarettes: a brief review. Published online 2021. Accessed October 2, 2024. https://sadil.ws/bitstream/handle/123456789/2002/2.pdf?sequence=1.
6. Jerzyński T, Stimson GV. Estimation of the global number of vapers: 82 million worldwide in 2021. Drugs, Habits and Social Policy, 2023; 24(2): 91-103.
7. Faeq DT, Ahmed DR, Aziz IA, Yıldırım M. Perceptions and usage of traditional cigarettes, electronic cigarettes, and waterpipes among young and middle-aged adults in Iraq: A descriptive study. Journal of Ethnicity in Substance Abuse. Published online July.
8. Jirjees F, Bashi YHD, Kharaba Z, Ahmadi K, Barakat M, AlObaidi H. Public awareness, prevalence, and regulations for the sale of electronic cigarettes in Arab countries: A narrative review. Tobacco induced diseases. 2023; 21. Accessed October 2, 2024. https.
9. Mazin G, Basmah M, Murad M. Prevalence and

Awareness toward Smoking Electronic Cigarette (vape) among Students of Medical Colleges at Baghdad. Iraqi Journal of Community Medicine, 2022; 35(2).

10. Mohammad Ahmed S, Prevalence and Perceptions toward electronic cigarettes (vaping) use among medical students: A new public health challenge in Kurdistan Region, Iraq. Journal of Medicinal and Chemical Sciences, 2024; 7(5): 750-728.

11. Al-jayyousi GF, Yaseen M, Mosleh N, Ali A, et al. Prevalence, risk factors, harm perception, and attitudes toward e-cigarette use among university students in Qatar: a crosssectional study. Frontiers in public health., 2021; 9: 682355.

12. M.L.Saddleson, L.T.Kozlowski, G.A.Giovino, et al. Risky behaviors, e-cigarette use and susceptibility of use among college students. Drug and Alcohol Dependence, 2015; 149: 25-30.

13. Alzahrani T, Alhazmi M, Alharbi A, et al. The prevalence of electronic cigarette Use Among College Students of Taibah University and symptoms of cardiovascular disease. Journal of the Saudi Heart Association., 2023 Jun 10; 35(2): 163-168.

14. Nazzal Z, Maraqa B, Azizeh, et al, Original research: Exploring the prevalence, knowledge, attitudes and influencing factors of e-cigarette use among university students in Palestine: A cross-sectional study. BMJ open, 2024; 14(2).

15. Luai A, Marina V, Mariam Ali, et al. Pattern of Tobacco Smoking and Nicotine Vaping among University Students in the United Arab Emirates: A cross-sectional study. International Journal of Environmental Research and Public Health.

16. Klesha P, Siew YK, Hanusha R, et al. Knowledge, Awareness, Beliefs and Prevalence of E-cigarettes Usage Among Undergraduate Students in a Private Medical College in Malaysia. International Journal of Biomedical and Clinical Sciences, 2020; 5(1).

17. Mustafa Ghanim, Maha Rabayaa, Mohammad Abuawad, et al. E-cigarette use among university students in Palestine: prevalence, knowledge, and determinant factors. PLOS ONE.

18. Juan F, Jianping R, Lixian R, et al. electronic cigarette knowledge, attitudes and use among students at a university in Hangzhou, China. National Library of Medicine. Tob Induc Dis., 2022 Jan 28.

19. Al-Sawalha NA, Almomani BA, Mokhemer E, et al. E-cigarette use among university students in Jordan: Perception and related knowledge. PLOS ONE., 2021; 16 (12 Dec).

20. MA Mansour, H Youssef, NA Al-Mawajdeh, I Ayasreh. Awareness, attitude and practice of smoking among medical sciences and non-medical sciences students at Taif university: comparative study. International Journal of Science and Research.

21. Shehata F, Faisal A, Faris A, et al. Awareness, attitude and practice regarding E-cigarettes among students at King Khalid University, Saudi Arabia. World Family Medicine Journal/ Middle East Journal of Family Medicine., 2020; 18(12).