Original Article

Iraqi National Journal of Medicine. January 2026, Volume 8, Issue 1

Electronic Smoking Prevalence and Awareness among Al-Nahrain Undergraduate Medical Students: A Cross-Sectional Study

Nibras Alaa Hussain [1], Tamara Ala'a Hussein [2]

[1] Family and Community Medicine Department, College of Medicine, Al-Nahrain University, Baghdad, Iraq. [2] Basic Sciences Department, College of Dentistry, Al-Iraqia University, Bagdad, Iraq.

ABSTRACT

Background: Smoking is a significant global cause of preventable morbidity and mortality, resulting in six million deaths worldwide each year. Electronic cigarettes are becoming increasingly popular among adolescents and young adults globally. **Aim**: This study aims to determine the prevalence of electronic smoking and awareness among Al-Nahrain undergraduate medical students. **Methods**: A cross-sectional study was conducted at the College of Medicine, Al-Nahrain University, Baghdad, Iraq. Data were collected during March and April, 2022. A total of 474 undergraduate students completed a modified standard questionnaire. Statistical analysis was performed using SPSS-26. **Results**: The prevalence of electronic smoking was found to be 12% of the total sample. Of the students surveyed, 350 (73.8%) were aware of electronic cigarettes. A significant association was observed (P-Value < 0.05) between smoking and being male, having history of smoking among friends or relatives, and a lack of awareness that electronic cigarettes are similar traditional cigarette smoking. **Conclusions**: More than one-tenth of the sample reported history of electronic smoking, and they were generally aware of most information regarding it. The usage is a significant public health issue; therefore, it is crucial to implement strict laws and policies to minimize the sale of these products to the younger population. Health promotion strategies should be developed to reduce the usage of electronic cigarettes.

Keywords: Electronic, smoking, students, awareness, Iraq.

Corresponding author: Nibras Alaa Hussain**.** E-mail**:** nibrasfamily77@gmail.com
Disclaimer: The authors declare no conflict of interest.

DOI: https://doi.org/10.37319/iqnjm.8.1.14

Received: 14 NOV 2024 Accepted: 17 JUN 2025 Published online: 15 JAN 2026

INTRODUCTION

Smoking is one of the most common preventable health threats, causing illness and death in the population. An estimated six million deaths occur each year due to tobacco use worldwide, and this number is projected to rise to more than eight million by 2030. Electronic cigarettes (e-cigarettes) have gained popularity among teenagers and young adults globally.[1] Observations on this issue are that of a study conducted four years old international travelers aged 16-30, from the United States, Canada, Europe, and New Zealand indicated that the usage of e-cigarettes increased considerably over last year's reaching 14.7% among ever-users in United States medical students in 2017.[2,3] Cultural risk factors associated with the onset of smoking in Western cultures are the following: friends or parents who smoke, low social status, history of psychiatric disorders, and

impulsivity. The initiation of smoking is often cultural and occurs in 30-50% of the population in Western societies. E-cigarettes come, in various forms and sizes, typically containing a battery, a heater, and a liquid solution.[4,5] When the liquid is vaporized into an aerosol upon heating, it usually contains nicotine. Users inhale the aerosol into their lungs, and upon exhaling, other.[6] may inhale the aerosol from the air. E-cigarettes are known by several other names. A notable case in March 2019 linked e-cigarettes to acute lung injury, with over 2,600 cases recorded. E-cigarette exposure can trigger stress and inflammatory responses within the pulmonary system, leading to symptoms such as shortness of breath, coughing, wheezing, bronchial and pulmonary irritation, and impaired pulmonary function.[7-9] Adverse effects on the cardiovascular system have also been documented, including: tachycardia and hypertension. Neurological effects include headaches, irritability, anxiety, dependence, and insomnia.[10] Other side effects may include eye irritation, dermatitis from skin contact, acute renal failure, and potential carcinogenicity.[11] However, research has shown improvements in time-based memory and nicotine addiction associated with the discontinuation of conventional smoking and the transition to e-cigarettes use. Additionally, toxic and carcinogenic metabolites have been reported to be lower in e-cigarettes users compared to conventional cigarette users.[12] A study from 2015 indicated that 10.6% of medical students had attempted E-cigarettes at some point.[13] In Iraq, the percentage of e-cigarettes users is reported to be 15.7% in Erbil.[14] However, the majority of other research has focused on traditional smoking. Given the significance of electronic smoking, this investigation aimed to locate the prevalence and variety of smoking among students at Al-Nahrain Medical University and to assess their level of awareness regarding it.

MATERIALS AND METHODS

Study Design and Setting: A cross-sectional study was conducted at the Faculty of Medicine, Al-Nahrain University in Baghdad, the capital of Iraq. Data were collected in March and April 2022 with the support of fourth-year students. Sampling and Procedure: A total of 474 undergraduate students participated by completing a questionnaire prepared by the researcher. A modified questionnaire specifically developed for this study was utilized. An appropriate randomly selected sample of all students who agreed to participate was included. The questionnaire: included demographic information such as sex, age, years of study, parents' education level, parents' occupation, family income, smoking behavior, and questions regarding electronic cigarette awareness.[15] Inclusion and Exclusion Criteria: All students who consented to participate in the study were included, with no exclusion criteria applied. Verbal consent was obtained from participants for inclusion in this study. Statistical analysis was performed using SPSS-26, WITH a significance level of less than 0.05 considered statistically significant.

RESULTS

Among the total sample of 474 students, the rate of all types of smoking was 87 (18.4%), while the rate of electronic smoking only was 57 (12%) of the total sample (Fig. 1,2). The ages of the participating students participating in the study ranged from 18 to 26 years, with a mean age of participants was 20.9 ± 1.7 years. Fourth-year students represented 34.2% of the students (Fig. 3). The educational status of the students Students' parents revealed that 239 (50.4%) of students' mothers had a college education, while 258 (54.4%) of students' fathers also had a college education. And most of the students' parents were governmental employed 222 (46.8%) for mothers and 297 (62.7%) for fathers. Additionally, 212 (44.7%) of the students reported a family income between 1-2 million ID, and 309 (65.2%) lived in Baghdad. Despite differences in their characteristics, no significant associations were found between these factors and smoking status (Table 1).

Of the students surveyed, 350 (73.8%) were aware of electronic cigarettes 237 (50%) had smoked electronic cigarettes with friends and/or family, and 400 (84.4%) knew that electronic cigarettes contained nicotine delivery systems. Additionally, 235 (49.6%) students were aware that electronic-cigarettes could be inhaled in different flavors, while only 169 (35.7%) knew that electronic cigarettes did not contain carbon monoxide. Furthermore, 331 (69.8%) students recognized that smoking electronic cigarettes as dangerous as smoking traditional cigarettes (Table 2). There was also a significant association between sex and smoking status ($p < 0.000$) (Table 3). There was a significant association between students' smoking status and having a history of smoking among relatives or friends ($p < 0.000$) (Table 4). There was a significant association between smoking status and not aware that the dangers of electronic cigarettes are just like traditional cigarette smoking ($p < 0.002$) (Table 5).

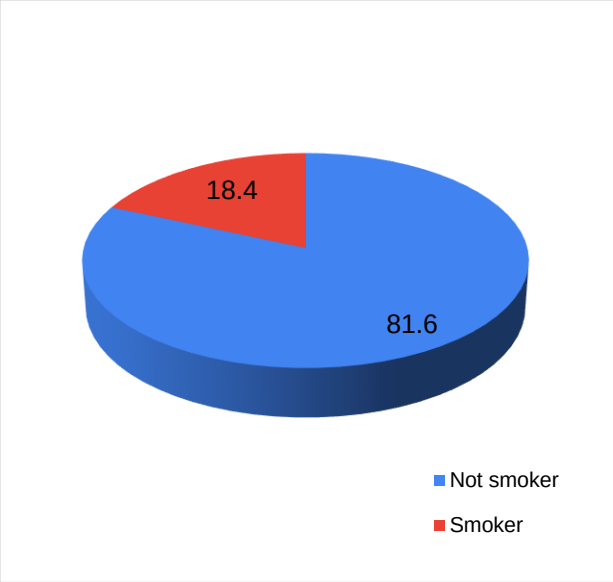

Figure 1: The Prevalence of all smoking types among the sample.

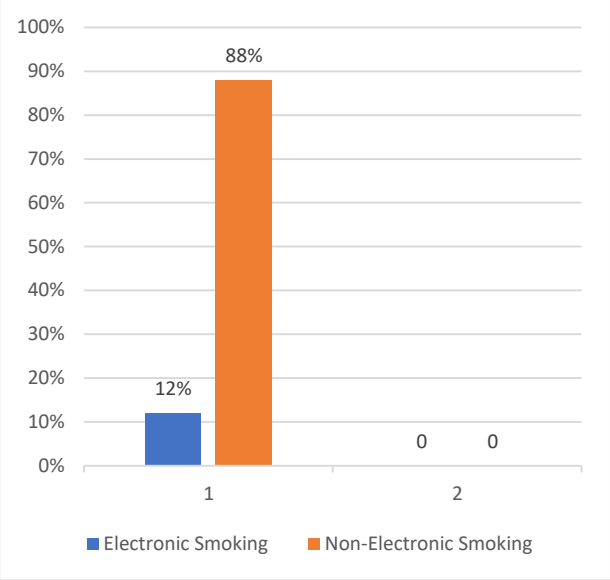

Figure 2: The Prevalence of electronic smoking among the sample.

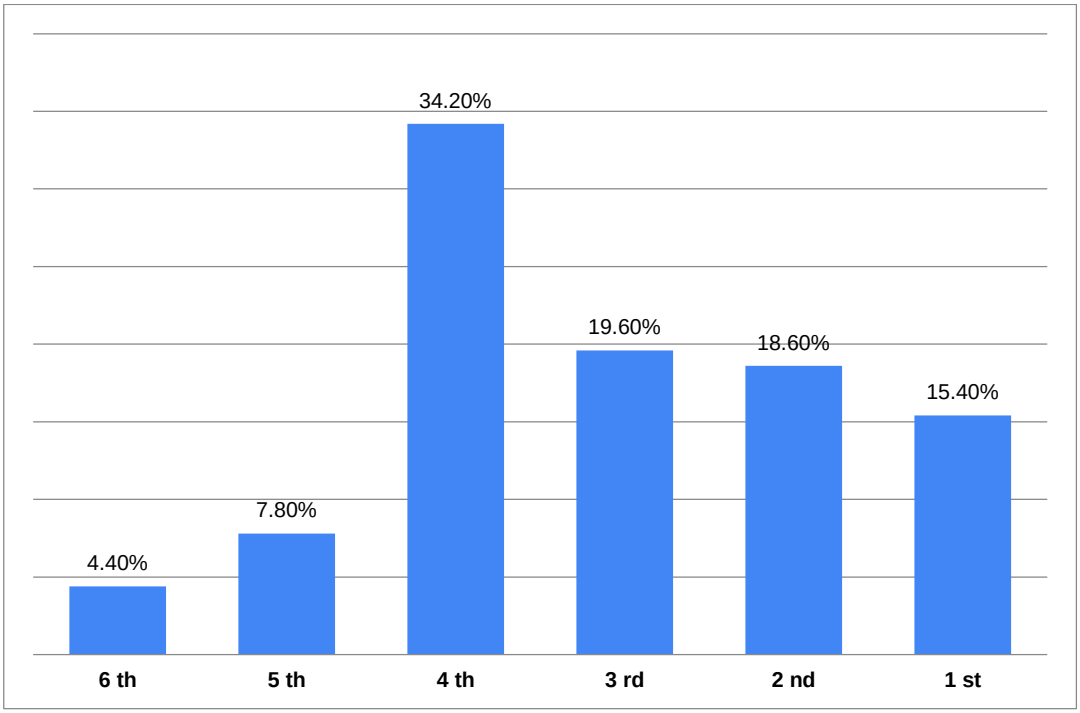

Figure 3: The distribution of the sample regarding the stages

Table 1: Significance association of smoking and sociodemographic characteristics.

Characteristics		Smoker	Non-smoker	Significance P- value
Father's Education	Illiterate	2 (33.3%)	4 (66.7%)	0.66
	Primary School	6 (25.0%)	18 (75.0%)	
	Secondary School	14 (20.9%)	5 (79.1%)	
	College	46 (17.8%)	212 (82.2%)	
	Higher Education	19 (16.0%)	100 (84.0%)	
Mother's Education	Illiterate	6 (33.3%)	12 (66.7%)	0.23
	Primary School	10 (19.6%)	41 (80.4%)	
	Secondary School	21 (22.3%)	73 (77.7%)	
	College	41 (17.2%)	198 (82.8%)	
	Higher Education	9 (12.5%)	63 (87.5%)	
Father's Occupation	Government Employee	46 (15.5%)	251 (84.5%)	0.11
	Self-employed	32 (23.0%)	107 (77.0%)	
	Unemployed	9 (23.7%)	29 (76.3%)	
Mother's Occupation	Government Employee	42 (18.9%)	180 (81.1%)	0.96
	Housewife	41 (17.9%)	188 (82.1%)	
	Self-employed	4 (17.4%)	19 (82.6%)	
Total Family Income in Iraqi Dinars	Less than One Million ID	19 (15.6%)	103 (84.4%)	0.58
	1- < 2 million ID	39 (18.4%)	173 (81.6%)	
	2-3 Million ID	16 (18.4%)	71 (81.6%)	
	3 Million ID and More	13 (24.5%)	40 (75.5%)	
Residence of the Students	Baghdad	54 (17.5%)	255 (82.5%)	0.5
	Other Governorates	33 (20.0%)	132 (80.0%)	

Table 2: Student Awareness about electronic cigarette smoking

Awareness Questions	Yes	Percent	No	Percent
Do you know about e-cigarettes?	350	73.8%	124	26.2%
Do you have e-cigarettes among your family and/or friends?	237	50%	237	50%
Did you know that e-cigarettes are a nicotine delivery system?	400	84.4%	74	15.6%
Did you know that e-cigarettes can be inhaled with different flavors?	235	49.6%	239	50.4%
Did you know that e-cigarettes do not burn or produce ash?	235	49.6%	239	50.4%
Did you know that e-cigarettes do not contain carbon monoxide?	169	35.7%	305	64.3%
Did you know that e-cigarettes can be inhaled with various additives?	317	66.9%	157	33.1%
Did you know that the harms of smoking electronic cigarettes are the same as those of smoking traditional cigarettes?	331	69.8%	143	30.2%

Table 3: Association between student smoking status and sex

Sex	Students' Smoking Status		Total	Significance P- value
	Non-Smoker	Smoker		
Female	265 (97.1%)	8 (2.9%)	273 (100%)	0.000
Male	122 (60.7%)	79 (39.3%)	201 (100%)	

Table 4: Association between student smoking status and history of smoking among Relatives/Friends.

History of Smoking among relatives/friends	Students' Smoking Status			Significance P-value
	Not smoker	Smoker	Total	
Yes	167 (70.5%)	70 (29.5%)	237 (100%)	0.000
No	220 (92.8%)	17 (7.2%)	237 (100%)	

Table 5: Association between student smoking status and awareness of the danger of E-Cigarettes.

Aware that the Dangers of electronic-cigarettes are similar to those of traditional cigarette smoking	Students' Smoking Status			Significance P-value
	Not smoker	Smoker	Total	
Yes	282 (85.2%)	49 (14.8%)	331 (100%)	0.002
No	105 (73.4%)	38 (26.6%)	142 (100%0	

DISCUSSION

Surprisingly, the consumption of electronic cigarettes is indeed increasing due to their contents, which include nicotine, flavorings, and other chemicals. Nicotine is a highly addictive substance that releases harmful chemical when inhaled through an electronic-cigarette.[16] The mean age of 20.9 ± 1.7 years, with fourth-year students accounting for 34.2% of the sample, similar to findings in Malaysia in 2018.[15] The prevalence of electronic cigarettes use in this sample was 12%, which is lower than the 15.7% reported by Muhammad Ahmed in Erbil. This discrepancy.[14] may be attributed to the higher proportion of females in the Erbil study, who are generally less likely to smoke than male, as well as the fact that our sample consisted solely of Some demographic characteristics of the students' parents were consistent with a study conducted in a European city in 2016. [17] Regarding awareness, most students were informed about e-cigarettes, which align with findings from studies conducted in Erbil.[14] and Malaysia.[15,18] Although most participants recognized that electronic cigarettes are nicotine delivery systems, only 30.2% were unaware that vaping is as harmful as smoking traditional cigarettes, a finding consistent with Amir Adib's study in Malaysia.[15] Male smokers were significantly more likely than female smokers, a finding corroborated by the Global Youth Tobacco Survey and a survey conducted by Romanian and Malaysian universities.[15,19] which found that nearly half of students had never tried electronic cigarettes, with males being more likely to smoke than females. Additionally, there was a significant association between student smoking and a history of smoking among friends or relatives, consistent with a study conducted in South Korea.[20]

CONCLUSIONS

The smoking rate in this study was lower than what's found in some regions of Iraq previously. The rate of smoking among males was higher than that among females. Most students were aware of information regarding electronic smoking. The usage of electronic cigarettes poses a major public health issue; therefore, it is essential to implement strict laws and policies to minimize the sale of these products to the younger population. Health promotion strategies should be developed to reduce the usage of electronic cigarettes.

REFERENCES

1. Kandasamy G, Sam G, Almanasef M, Almeleebia T, Shorog E, Alshahrani AM, et al. A study on the prevalence of smoking habits among the student community in Aseer Region, Saudi Arabia. Front Public Health. 2023;11:1257131. doi: 10.3389/fpubh.2023.1257131
2. Hinderaker K, Power DV, Allen S, Parker E, Okuyemi K. What do medical students know about e-cigarettes? A cross-sectional survey from one U.S. medical school. BMC Med Educ. 2018;18(1):32. doi: 10.1186/s12909-018-1134-1
3. Lin M, Chu M, Li X, Ma H, Fang Z, Mao L, et al. Factors influencing adolescent experimental and current smoking behaviors based on social cognitive theory: A cross-sectional study in Xiamen. Front Public Health. 2023;11:1093264. doi: 10.3389/fpubh.2023.1093264
4. West R. Tobacco smoking: Health impact, prevalence, correlates, and interventions. Psychol Health. 2017;32(8):1018–36. doi: 10.1080/08870446.2017.1325890
5. Alexander JP, Coleman BN, Johnson SE, Tessman GK, Tworek C, Dickinson DM. Smoke and vapor: Exploring the terminology landscape among electronic cigarette users. Tob Regul Sci. 2016;2(3):204–13. doi: 10.18001/TRS.2.3.1
6. Cunningham A, Slayford S, Vas C, Gee J, Costigan S, Prasad K. Development, validation, and application of a device to measure e-cigarette users' puffing topography. Sci Rep. 2016;6:35071. doi: 10.1038/srep35071
7. Cherian SV, Kumar A, Estrada-Y-Martin RM. E-cigarette or vaping product-associated lung injury: A review. Am J Med. 2020;133(6):657–63. doi: 10.1016/j.amjmed.2020.02.004
8. Layden JE, Ghinai I, Pray I, Kimball A, Layer M, Tenforde MW, et al. Pulmonary illness related to e-cigarette use in Illinois and Wisconsin – Final report. N Engl J Med. 2020;382(10):903–16. doi: 10.1056/NEJMoa1911614
9. Abafalvi L, Pénzes M, Urban R, Foley KL, Kaan R, Kispélyi B, Hermann P. Perceived health effects of vaping among Hungarian adult e-cigarette-only and dual users: A cross-sectional internet survey. BMC Public Health. 2019;19(1):1–10. doi: 10.1186/s12889-019-6629-0
10. National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems. Public health consequences of e-cigarettes. Washington (DC): National Academies Press; 2018 Jan 23. PMID: 29894118
11. Gaur S, Agnihotri R. Health effects of trace metals in electronic cigarette aerosols: Systematic review. Biol Trace Elem Res. 2019;188(2):295–315. doi: 10.1007/s12011-018-1423-x
12. Seiler-Ramadas R, Sandner I, Haider S, Grabovac I, Dorner TE. Health effects of electronic cigarette (e-cigarette) use on organ systems and its implications for public health. Wien Klin Wochenschr. 2021;133(19–20):1020–7. doi: 10.1007/s00508-020-01711-z
13. Almutham A, Altami M, Sharaf F, AlAraj A. E-cigarette use among medical students at Qassim University: Knowledge, perception, and prevalence. J Family Med Prim Care. 2019;8(9):2921–6. doi: 10.4103/jfmpc.jfmpc_567_19
14. Muhammad Ahmed S. Prevalence and perceptions toward electronic cigarettes (vaping) use among medical students: A new public health challenge in the Kurdistan Region, Iraq. J Med Chem Sci. 2024;7(5):720–8. doi: 10.26655/JMCHEMSCI.2024.5.8
15. Adib A, Normala R, Lukman ZM, Azlini C, Kama MY. Student awareness about the use of electronic cigarettes in Malaysia. Int J Res Innov Soc Sci. 2018;2(7). Available from: https://www.researchgate.net/publication/337494700_Student_Awareness_about_the_Use_of_Electronic_Cigarettes_in_Malaysia

16. Abrams DB. Promise and peril of e-cigarettes: Can disruptive technology make cigarettes obsolete? JAMA. 2014;311(2):135–6. doi: 10.1001/jama.2013.285347
17. Alves J, Perelman J, Soto-Rojas V, Richter M, Rimpelä A, Loureiro I, et al. The role of parental smoking on adolescent smoking and its social patterning: A cross-sectional survey in six European cities. J Public Health (Oxf). 2017;39(2):339–46. doi: 10.1093/pubmed/fdw040
18. Abd Razak R, Hazlyna NH, Shahril AE, Azman AN, Zainudin NM. Awareness of e-cigarettes among students in Malaysian public universities. Turk J Comput Math Educ. 2021;12(3):1602–8. Available from: https://turcomat.org/index.php/turkbilmat/article/view/975
19. Lotrean LM. Use of electronic cigarettes among Romanian university students: A cross-sectional study. BMC Public Health. 2015;15:358. doi: 10.1186/s12889-015-1713-6
20. Joung MJ, Han MA, Park J, Ryu SY. Association between family and friend smoking status and adolescent smoking behavior and e-cigarette use in Korea. Int J Environ Res Public Health. 2016;13(12):1183. doi: 10.3390/ijerph13121183