



Online ISSN (2789-3219)

Research Article

Smoking Trends, Influencers, and Attitudes Among Future Medical Professionals

Vian Qahtan Abduljabbar¹ , Shaimaa Saleh Khudhur² , Ehab Mudher Mikhael^{1*} ¹Department of Clinical Pharmacy, College of Pharmacy, University of Baghdad, Baghdad, Iraq; ²Department of Clinical Pharmacy, College of Pharmacy, Tikrit University, Tikrit 34001, Iraq

Received: 20 July 2025; Revised: 27 August 2025; Accepted: 1 September 2025

Abstract

Background: While medical students should model healthy behaviors, smoking is common among them. Data on smoking among Iraqi medical students remains limited. **Objective:** To determine the prevalence, attitudes, and influencing factors for smoking among Iraqi medical students. **Methods:** A cross-sectional study was conducted from December 2024 to March 2025, involving 250 medical students at Baghdad University. Participants completed a self-administered questionnaire that was newly developed based on relevant literature and validated by a panel of experts. The developed questionnaire was designed to assess smoking status and its influencing factors, attitudes towards smoking, quitting behavior and its influencing factors. **Results:** Participants' mean age was 21.02 ± 2.16 years; most were single (93.2%) females (58.4%). 41.2% of participants smoked at least once in their life, with 52.42% of those being daily smokers. Cigarettes and hookah were the most tried smoking methods. Peer influence (29%) and stress (24%) were cited as smoking motivators. Additionally, male gender, older age, enrollment in Medicine College, higher academic level, and greater family income were all significantly linked to smoking trials. While 79.61% of smoking participants cited health issues as a quitting motivator, only 33.33% had tried to quit. Most participants had negative attitudes towards smoking. **Conclusions:** Smoking is highly prevalent among Iraqi medical students despite their negative attitudes towards it. Male gender, older age, enrollment in medical college, higher academic levels, greater family income, peer pressure, and stress increase smoking likelihood. Health concerns serve as motivators for smoking cessation; however, few smokers have attempted to quit.

Keywords: Attitudes, Influencing factors, Medical students, Smoking, University of Baghdad.

الأنماط السائدة والمؤثرات والمواقف تجاه التدخين بين المهنيين الطبيين المستقبليين

الخلاصة

الخلفية: بينما يجب على طلاب الطب نمذجة السلوكيات الصحية، فإن التدخين شائع بينهم. لا تزال البيانات المتعلقة بالتدخين بين طلاب العلوم الطبية العراقيين محدودة. **الهدف:** تحديد انتشار التدخين ومواقفه والعوامل المؤثرة عليه بين طلاب الطب العراقيين. **الطرائق:** أجريت دراسة مقطعية من ديسمبر 2024 إلى مارس 2025، شملت 250 طالباً في الطب في جامعة بغداد. أكمل المشاركون استبياناً ذاتياً تم تطويره حديثاً بناءً على الأدبيات ذات الصلة وتم التحقق من صحته من قبل لجنة من الخبراء. تم تصميم الاستبيان المطور لتقييم حالة التدخين والعوامل المؤثرة فيه والمواقف تجاه التدخين وسلوك الإقلاع عن التدخين والعوامل المؤثرة فيه. **النتائج:** كان متوسط عمر المشاركين 21.02 ± 2.16 سنة، كان معظمهم من الإناث (93.2%) (58.4%). 41.2% من المشاركين يدخنون مرة واحدة على الأقل في حياتهم، مع 52.42% من هؤلاء المدخنين يومياً. كانت السجائر والشيشة أكثر طرق التدخين المتبعة. تم الاستشهاد بتأثير الأقران (29%) والإجهاد (24%) كمحفزات للتدخين. بالإضافة إلى ذلك، ارتبط جنس الذكور، والشيشة، والاتحاق بكلية الطب، والمستوى الأكاديمي الأعلى، وزيادة دخل الأسرة بشكل كبير بتجارب التدخين. في حين أن 79.61% من المشاركين في التدخين ذكروا المشكلات الصحية كحافز للإقلاع عن التدخين، حاول 33.33% فقط الإقلاع عن التدخين. كان لدى معظم المشاركين مواقف سلبية تجاه التدخين. **الاستنتاجات:** التدخين منتشر بشكل كبير بين طلاب الطب العراقيين على الرغم من مواقفهم السلبية تجاهه. يقترن جنس الذكور، والتقدم في السن، والاتحاق بكلية الطب، والمستويات الأكاديمية الأعلى، وزيادة دخل الأسرة، وضغط الأقران، والإجهاد من احتمالية التدخين. تعمل المخاوف الصحية كمحفزات للإقلاع عن التدخين. ومع ذلك، حاول عدد قليل من المدخنين الإقلاع عن التدخين.

* **Corresponding author:** Ehab M. Mikhael, Department of Clinical Pharmacy, College of Pharmacy, University of Baghdad, Baghdad, Iraq; Email: ihab.maddr@copharm.uobaghdad.edu.iq**Article citation:** Abduljabbar VQ, Khudhur SS, Mikhael EM. Smoking Trends, Influencers, and Attitudes Among Future Medical Professionals. *Al-Rafidain J Med Sci.* 2025;9(2):151-158. doi: <https://doi.org/10.54133/ajms.v9i2.2320>© 2025 The Author(s). Published by Al-Rafidain University College. This is an open access journal issued under the CC BY-NC-SA 4.0 license (<https://creativecommons.org/licenses/by-nc-sa/4.0/>).

INTRODUCTION

Tobacco consumption remains a well-established major modifiable risk factor contributing to the global burden of disease, persisting as a critical public health challenge [1]. Thus, there was an extensive international effort to reduce its use. However, smoking remains prevalent globally, with approximately 22.3% of adults aged 15 years and older using tobacco products [2]. Notably, the Middle East and North Africa (MENA) region

exhibits disproportionately elevated prevalence rates of tobacco consumption globally [3]. In Arab countries, the age-adjusted prevalence of smoking is notably high, ranging from 16.9% in Oman to 41.9% in Lebanon [4]. In Iraq, the prevalence of smoking is also significant, at 22.44%, with a much higher prevalence among males compared to females [5]. Socioeconomic status is a significant factor contributing to the high prevalence of smoking in Arab countries, with lower-income and less-educated individuals being more likely to smoke [6]. Cultural

factors also play a pivotal role in shaping smoking behaviors, particularly in Arab societies. The societal normalization of smoking, especially among males, coupled with the widespread use of water pipes in social settings, contributes to elevated smoking prevalence rates. Research conducted by Jawad *et al.* underscores the cultural significance of water-pipe smoking in Arab cultures, which often facilitates initiation and perpetuates continued use [7]. Tobacco control policies in Arab countries vary significantly, with stricter measures like high taxes and comprehensive smoking bans linked to lower smoking rates [8]. In Iraq the national anti-smoking law was introduced in 2012; however, its weak enforcement has permitted smokers to continue smoking in designated public indoor spaces where it is prohibited [9]. Medical students, as future healthcare professionals, are expected to serve as role models for promoting healthy behaviors and disease prevention; thus, smoking rates among medical students must be lower than the general population due to their awareness of health risks. However, studies indicate that tobacco use is still common behavior among medical students, particularly in regions with higher stress levels or in countries with more permissive social attitudes toward smoking [10-13]. In Iraq, few studies were conducted to assess prevalence among medical college students [14,15]; however, these studies were limited by being conducted in the Kurdistan region [14], two decades ago (before legislation of the anti-smoking act and before the introduction of vaping devices) [14,15]. It is well known that understanding the prevalence of smoking among medical students, as well as the factors influencing this behavior, is crucial for developing targeted educational interventions [16]. Therefore, the current study aimed to assess the prevalence of smoking among medical students at the University of Baghdad, explore their attitudes toward smoking, and identify the key factors that influence smoking behavior within this population.

METHODS

Development and validation of the questionnaire

A thorough literature review was conducted to identify studies utilizing questionnaires that investigate the prevalence, attitudes, and factors associated with smoking among university students. Five relevant articles were found [17-21]. The questionnaire items and ideas in the aforementioned studies were utilized to write the first draft of the current study questionnaire. The developed questionnaire comprised three sections: the first section designed to gather demographic data of the participants besides assessing the potential factors influencing smoking behavior; the second part designed to evaluate students' attitudes toward smoking. The last section of the questionnaire specifically targets participants who have tried smoking, assessing various aspects of their smoking behavior, motivations, and experiences. To assess the content validity of the questionnaire, it was sent to a

panel of three experts (two academic pharmacists and one academic psychologist). These experts were selected based on their extensive experience in smoking cessation programs and their expertise in questionnaire validation. The experts were asked to assess each question using a 3-point Likert scale: relevant and important, relevant but not important, and not relevant. They were informed that they have the freedom to write any comments regarding wording issues and suggest additions to new questions. All questionnaire items were considered relevant and important by all experts except one item, which was considered irrelevant by one expert and thus was removed. The revised questionnaire was accepted by all experts.

Study design

A cross-sectional study was conducted from December 2024 to March 2025 on a convenient sample of medical students (pharmacy and medicine) at the University of Baghdad. Because the minimum required sample size is 200 [22], the target in this study was set at 250 students to ensure adequate statistical power. All students in the medical colleges were considered eligible to participate in this study. Eligible students were informed about the study objective, and only those who provided their verbal informed consent were included in this study. All enrolled students were given the paper-based questionnaire and asked to fill it out by themselves. The study was ethically approved by the ethical committee at the College of Pharmacy, University of Baghdad (Ethical approval number RECAUBCP-2210/2024R).

Variable definitions and measurements

To ensure clarity and consistency throughout the study, the following definitions were used for key variables; Current smokers: Participants who currently smoke tobacco products. Ex-smokers: Participants who previously smoked but are no longer engaging in smoking. Ever-smokers: Participants who have tried smoking at least once in their lifetime, regardless of their current smoking status.

Statistical analysis

Data input and analysis was done using SPSS version 17. Categorical variables were presented as numbers and percentages, whereas continuous variables were presented as mean $\pm$ standard deviation. For statistical purposes, participants' responses for questions with a Likert scale were graded from 1 to 5. Chi square test was used to test the significance of the difference among categorical variables. Pearson correlation test was used to test the correlation among study variables. *p* values less than 0.05 were considered significant.

RESULTS

The mean age of participating students was 21.02 ± 2.16 years. Most participants were females (58.4%), singles (93.2%), and lived in urban areas (86.0%). One hundred participants (40%) were studying in a medical college, and 150 participants (60%) were studying in a pharmacy college. Further details about demographics of study participants are

shown in Table 1. Regarding smoking status, 41.2% of participants were ever-smokers, of which 52.42% were daily smokers. The most common age at first experience with smoking was ≥ 19 years. Cigarettes and hookah were the most commonly tried smoking types. Smoking of close friends (29%) and stress (24%) were the most commonly reported motivators for smoking. Full details are shown in Table 2.

Table 1: Demographics of study participants

Parameter	Value
Age (year)	21.02 $\pm$ 2.16
Gender	Male Female
Faculty studying in	Medicine Pharmacy
Student's academic level	1 st 2 nd 3 rd 4 th 5 th 6 th
Marital status	Single Married
Main (primary) residence	Urban Rural
Residence during academic years	Off-campus with friends Off-campus with family Public hostel

Values were expressed as frequency, percentage and mean $\pm$ SD.

Table 2: Smoking status among study participants

Parameter	n (%)
Smoke at least once in their life (n=250)	Yes No
Smoking habit among those who smoked at least one time (n=103)	Daily smoking <10 times of smoking/day 10-20 times of smoking/day > 20 times of smoking /day Few times weekly Few times monthly On limited occasions Previous smoker
Current smokers	Male Female
Age at first experience with smoking (n=103)	<10 years 11-15 years 16-18 years ≥ 19 years
The type of smoking that was ever tried (n=103)	One type only Cigarettes Hookah Vape Pipe Two types Cigarettes and Hookah Hookah and vape Cigarettes and vape Cigarettes and cigar Hookah and cigar Three types or more
Most common smoking type (n=103)	Cigarettes Hookah Vape Cigar
Motivator for smoking (n=103)	Close friends are smoking Curiosity Smoking makes people more attractive Presence of smokers in the family Stress Boredom Advertisements in social media or TV Other non-specified reasons

Table 3 shows that factors such as male gender, older age, studying in medical college, higher academic stages, and greater family income were significantly different between students who tried smoking and

those who did not. Table 4 shows that 79.61% of smoking participants considered health issues to be the main motivator for smoking cessation. Nearly two-thirds of smoking participants had a desire to

quit smoking; however, only about half of them tried smoking cessation. Most smoking participants

(81.25%) had a strong belief in their self-efficacy to quit smoking when they desired to do so.

Table 3: Differences in socio-demographic factors between ever smokers and non-smokers

Parameter		All participants (n=250)	Non-smokers (n=147)	Ever smokers (n=103)	p-value
Gender	Male	104(41.6)	48(46.15)	56(53.84)	<0.001
	Female	146(58.4)	99(67.8)	47(32.19)	
Faculty	Pharmacy	150(60)	107 (71.33)	43(28.66)	<0.001
	Medicine	100(40)	40 (40)	60(60)	
Age (year)		21.02±2.16	20.52±1.79	21.72±2.45	<0.001
Academic level	1 st	35(14)	29(82.85)	6 (17.14)	<0.001
	2 nd	50(20)	30(60)	20(40)	
	3 rd	44(17.6)	25(56.81)	19(43.18)	
	4 th	40(16)	30(75)	10(25)	
	5 th	70(28)	31(44.28)	39(55.71)	
	6 th	11(4.4)	2(18.18)	9(81.81)	
Marital status	Single	147(58.8)	139(94.55)	8(5.44)	0.308
	Married	103(41.2)	94(91.26)	9(8.73)	
Family size	≤4	80(32)	42(52.5)	38(47.5)	0.308
	5-8	148(59.2)	90(60.81)	58(39.18)	
	>8	22(8.8)	15 (68.18)	7(31.81)	
Family monthly income	<1 million IQD	59(23.6)	36(61.01)	23(38.98)	<0.001
	1-2 million IQD	120(48)	82(68.33)	38(31.66)	
	≥2 million IQD	71(28.4)	29(40.84)	42(59.15)	
Father educational level	Illiterate	4(1.6)	1(25)	3(75)	0.233
	Primary	6(2.4)	3(50)	3(50)	
	Intermediate	18(7.2)	15(83.33)	3(16.66)	
	Secondary	25(10)	14(56)	11(44)	
	Diploma	43(17.2)	25(58.13)	18(41.86)	
	College	121(48.4)	67(55.37)	54(44.62)	
Mother educational level	Postgraduate	33 (13.20)	22(66.66)	11(33.33)	0.733
	Illiterate	9(3.6)	4(44.44)	5(55.55)	
	Primary	13(5.2)	9(69.23)	4(30.76)	
	Intermediate	27(10.8)	17(62.96)	10(37.03)	
	Secondary	36(14.4)	23(63.88)	13(36.11)	
	Diploma	42(16.8)	27(64.28)	15(35.71)	
Father's job	College	99(39.6)	53(53.53)	46(46.46)	0.192
	Postgraduate	24(9.6)	14(58.33)	10(41.66)	
	Employed	121(48.4)	75(63.02)	44(36.97)	
	Private sector	69(27.6)	33(47.82)	36(52.17)	
	Retired	51(20.4)	32(62.74)	19(37.25)	
	Not working	11(4.4)	7(63.63)	4(36.36)	
Mother's job	Employed	143(57.6)	87(60.83)	56(39.16)	0.873
	Retired	76(30.4)	43(56.57)	33(43.42)	
	Private sector	12(4.8)	7(58.33)	5(41.66)	
	Employed	19(7.8)	10(52.63)	9(47.36)	
Main residence	Rural	35(14)	20(57.14)	15(42.85)	0.830
	Urban	215(86)	127(59.06)	88(40.93)	
Residence during academic years	Off-campus with friends	33(13.2)	18 (54.54)	15(45.45)	0.097
	Off-campus with family	198(79.2)	122(61.61)	76(38.38)	
	Public hostel	19(7.8)	7(36.84)	12(63.15)	
Living status of the father	Alive	225(90)	135(60)	90(40)	0.248
	Died	25(10)	12(48)	13(52)	
Living status of the mother	Alive	241(96.4)	141(58.5)	100(41.49)	0.626
	Died	9(3.6)	6(66.66)	3(33.33)	

Values were expressed as frequency (%), and mean±SD.

Table 4: Motivation and readiness for smoking cessation

Parameter	n (%)	
Motivator for smoking cessation (n=103)*	Health issues	82(79.61)
	Financial issues	12(11.65)
	Pressure from family	2(1.94)
	Pressure from friends	7(6.79)
A desire to quit smoking#(n=96)	Yes	61(63.54)
	No	35(36.46)
Smoking cessation# (n=96)	Tried	32(33.33)
	Not tried	64(66.67)
Belief in self-efficacy to quit when desire# (n=96)	Yes	78(81.25)
	No	18(18.75)

*Answers were obtained from current and previous smokers; # Answers were obtained from current smokers

Table 5 shows that more than two-thirds of study participants had negative attitudes towards smoking as being harmful to health and addictive. Meanwhile, more than half of study participants had a positive attitude towards banning smoking in indoor public

areas and about smoking advertisements. There is a significantly different attitude towards the effects of smoking on health and the banning of smoking between current smokers and non-smokers (Table 6).

Table 5: Attitudes of study participants towards smoking (n=250)

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
To what extent do you agree that smoking is harmful to health?	11(4.4)	26(10.4)	44(17.6)	87(34.8)	82(32.8)
"To what extent do you agree that there is a likelihood of becoming addicted to smoking?	42(16.8)	30(12)	12(4.8)	61(24.4)	105(42)
To what extent do you agree that smoking should be banned in indoor public areas such as restaurants and cafes'?	25(10)	52(20.8)	43(17.2)	54(21.6)	76(30.4)
To what extent do you agree that smoking should be banned in outdoor areas such as playgrounds and parks?	30(12)	65(26)	61(24.4)	47(18.8)	47(18.8)
To what extent do you agree that advertisements for smoking and its products should be banned?	19(7.6)	38(15.2)	54(21.6)	60(24)	79(31.6)

Values were expressed as frequency and percentage.

Table 6: Effect of being a current smoker on the attitudes of study participants about smoking

Question	Smoking status	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	p-value
To what extent do you agree that smoking is harmful to health?	Current smokers	5(5.21)	14(14.58)	29(30.2)	34(35.42)	14(14.5)	<0.001
	Non-smokers	6(3.9)	12(7.79)	15(9.74)	53(34.4)	68(44.2)	
"To what extent do you agree that there is a likelihood of becoming addicted to smoking?	Current smokers	17(17.7)	11(11.5)	4(4.2)	31(32.30)	33(34.4)	<0.001
	Non-smokers	25(16.23)	19(12.3)	8(5.19)	30(19.5)	72 (46.8)	
To what extent do you agree that smoking should be banned in indoor public?	Current smokers	8(8.33)	31(32.29)	25(26.04)	22(22.91)	10(10.41)	<0.001
	Non-smokers	17(11.03)	21(13.63)	18(11.68)	32(20.77)	66(42.85)	
To what extent do you agree that smoking should be banned in outdoor areas?	Current smokers	20(20.83)	38(39.58)	18(18.75)	14(14.58)	6(6.25)	<0.001
	Non-smokers	10(6.49)	27(17.53)	43(27.92)	33(21.42)	41(26.62)	
To what extent do you agree that advertisements of smoking and its products should be banned?	Current smokers	7(7.29)	24(25.0)	31(32.29)	21(21.87)	13(13.54)	<0.001
	Non-smokers	12(7.79)	14(9.09)	23(14.93)	39(25.32)	66(42.85)	

Values were expressed as frequency and percentage. *Current smokers were 96 participants whereas 154 participant smokers not currently smokers.

DISCUSSION

Understanding the prevalence of smoking and the factors influencing it among future healthcare professionals is crucial, given the health risks associated with smoking and the role of medical students as models for promoting health and health education in the future. In this study, the demographic characteristics of the participants mainly included young women, with an average age of 21.02 years, a trend that aligns with findings from comparable studies [23-25]. Furthermore, most participants resided in urban settings. This result was anticipated, given that most Iraqis today live in urban areas [26]. The results of the current study revealed that 41.2% of participants had experienced smoking at least once in their lifetime, with more than half of them (21.6%) being daily smokers. This prevalence is comparable to the smoking rates among the general Iraqi population [5]. However, given that the study sample comprises future health professionals, this prevalence is considered high and alarming. Several factors were reported as an influence for smoking behavior among the participating students. Firstly, stress; indeed, the intense academic and psychological pressures inherent in medical school may lead students to adopt smoking as a coping mechanism and as a means of dealing with boredom and stress [27]. However, stress should be reduced by utilizing more beneficial activities such as reading, engaging in physical activity, or listening to music [28]. Secondly, peers and close friends were

strong motivators for smoking. This result aligns with the findings of Khader and Al-Saadi, who reported that 47.4% of university students identified friends as the primary factor behind smoking initiation [29]. This finding is highly expected since people in this age group are influenced by their peers due to their constant interaction with them. Other factors may be the exposure to smoking behaviors within clinical or academic environments, and the normalization of smoking in certain social circles may also contribute [27]. Additionally, the absence of targeted anti-smoking interventions and support programs within medical faculties could facilitate the persistence of smoking among this population [30,31]. Moreover, despite possessing medical knowledge, some students may develop a false sense of immunity to the health risks associated with tobacco use. In the present study, cigarettes were the most common form of smoking among the participating medical students, followed by hookah and e-cigarettes. This smoking pattern is generally consistent with findings from a recent Saudi study, which also reported cigarettes as the leading type, followed by hookah; however, hookah use was more prevalent in the Saudi cohort (38.3% vs. 22.2%) than in the current study [32]. On the other hand, the current study results revealed that the most common age at first experience with smoking was ≥ 19 years. This finding is inconsistent with another study conducted at Al-Andalus University [31], which indicated that 72.2% of students began smoking at ≤ 19 years. This finding may be partially attributed to

the close supervision of Iraqi families over their children during adolescence. Additionally, most Iraqis under 18 years of age receive financial support from their parents, which may reduce the likelihood of smoking in individuals younger than 19 years. This explanation aligns with a previous study that examined factors influencing smoking behavior, where the proportion of students living away from their families was 27.8%, compared to 16.2% for those residing with their families. This result underscores the protective role of family environments in reducing smoking rates [33]. Moreover, many young adults tend to underestimate the long-term health risks of smoking, often perceiving it as a transient or relatively low-risk behavior [34]. Academic, emotional, and social pressures encountered during university life may constitute significant contributing factors to early smoking initiation, particularly in contexts where tobacco use is socially sanctioned and easily obtainable [31,35]. The findings of the present study indicated a higher prevalence of smoking among male students compared to their female counterparts. This gender disparity may be linked to cultural and social factors in Iraq. Similarly, this finding aligns with previous studies conducted among medical students in Arab countries where smoking behaviors are more prevalent among males than females [29,31-33]. However, the prevalence of smoking among the female medical students in the current study (17.2%) is higher than that reported in Saudi Arabia (a neighboring country to Iraq) [32]. Two factors may contribute to the higher smoking prevalence among participating Iraqi females. First, women often prefer to smoke hookah, as they consider it less addictive [36]. This, coupled with the widespread availability of hookah in many Iraqi households and restaurants, may facilitate experimentation and increase the risk of nicotine dependence among Iraqi females. On the other hand, the abundance of inexpensive vapes in the Iraqi market [37], coupled with their popularity among young adults, especially females, on social media [38], also plays a significant role in shaping smoking behaviors. The current study's findings indicate a statistically significant relationship in the prevalence of smoking and the stage of study, as the percentage of students who had tried smoking increased at later stages. These results are consistent with a study conducted by Al-Khader and Al-Saadi [29], which pointed to a significant increase in smoking prevalence with advancing academic years. This may be attributed to students' interactions with friends and older peers within the university environment. In addition to the stress resulting from the intensive study in medical colleges, which increases with the progression of academic years [29]. On the other hand, the current study results showed a strong positive correlation between family income and an increase in smoking prevalence. Similarly, smoking is directly and positively correlated with the income of university students in the United Arab Emirates and Syria [31,39]. The current result is somewhat reasonable since financial capability is necessary to

purchase new tobacco devices and products (e-cigarettes and hookah), which are commonly utilized nowadays and especially among current study participants. Additionally, smoking may be perceived as a symbol of status or luxury, influenced by societal and community influence among higher-income families [40]. A notable finding of the current study was that a greater proportion of students in the medicine college smoked compared to those in the pharmacy. The current finding is supported by the results of a recent study conducted among medical students in the Kurdistan Region, which demonstrated that pharmacy students exhibited a greater level of awareness regarding the harms of smoking compared to their counterparts in the medicine college [37]. These observations underscore the potential influence of academic discipline and educational environment on smoking behavior, suggesting that the college setting may play a critical role in shaping students' attitudes and susceptibility toward smoking initiation. Regarding attempts to quit smoking, about two-thirds of participants expressed a desire to quit. A previous study conducted at Sultan Qaboos University found that more than half of the smoking students wished to quit and showed interest in participating in therapeutic and counseling programs to support their cessation efforts [41]. Despite this, only about half of current smokers have actually tried to stop smoking, indicating a gap between intention and action; such gaps should be addressed through targeted educational initiatives. A similar regional study confirms the need for targeted health-focused programs to bridge this gap [42]. Most participants in the current study identified health concerns as the primary motivator for smoking cessation. Therefore, educational programs should emphasize the health risks associated with smoking to strengthen motivation and increase awareness. By integrating information about health consequences and providing accessible support and counseling services, educational institutions can play a vital role in encouraging and facilitating smoking cessation among students. The results of the current study showed that most study participants, especially non-smokers, had negative attitudes about smoking, viewing it as harmful to health and addictive. Moreover, most non-smokers expressed positive attitudes toward banning smoking and restricting smoking advertisements. These attitudes reflect a growing awareness of the hazards of smoking. Meanwhile, the current findings align with those in a study conducted at Sultan Qaboos University, where smokers exhibited fewer negative attitudes toward smoking compared to their non-smoking peers [41]. This suggests that nicotine dependence may influence the acceptance of anti-smoking health messages [41,43].

Study limitations

The generalizability of the present findings is limited due to the study's restriction to a convenient sample of students from the Colleges of Medicine and

Pharmacy at the University of Baghdad. As a result, the findings may not be representative of smoking behaviors among students in other academic institutions or regions within Iraq. Moreover, the use of self-reported data introduces potential sources of bias, including recall and social desirability bias, which may compromise the validity of the results compared to more objective assessment methods. Additionally, the study tool was not tested on a pilot sample of study participants prior to the study; however, this limitation is relatively minor given that the content of the questionnaire was validated by a panel of experts.

Conclusion

Smoking is highly prevalent among the participating medical students. Factors such as male gender, older age, enrollment in medical college, higher academic levels, greater family income, peer pressure, and stress are associated with increased likelihood of smoking. Health concerns serve as primary motivators for cessation efforts. Despite awareness of health risks, few of the smoking participants have attempted to quit. Targeted interventions within medical colleges are crucial to foster smoke-free lifestyles and prepare future healthcare professionals to effectively promote public health.

Conflict of interests

The authors declared no conflict of interest.

Funding source

The authors did not receive any source of funds.

Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

REFERENCES

- Kim J, Song H, Lee J, Kim YJ, Chung HS, Yu JM, et al. Smoking and passive smoking increases mortality through mediation effect of cadmium exposure in the United States. *Sci Rep*. 2023;13(1):3878. doi: 10.1038/s41598-023-30988-z.
- Global Adult Tobacco Survey Collaborative Group. Global Adult Tobacco Survey (GATS): Core questionnaire with optional questions, version 2.0. Atlanta, GA: Centers for Disease Control and Prevention; 2016-2020.
- Abubaker A, Alrefaie A, Jum'a M, Al-Azaideh B, Alitelat A, Alajmi H, et al. Status of smoking research in Jordan: Scoping review and evidence synthesis. *High Yield Med Rev*. 2023;1(1). doi:10.59707/hymrILSQ2807.
- Maziak W, Nakkash R, Bahelah R, Hussein A, Fanous N, Eissenberg T. Tobacco in the Arab world: old and new epidemics amidst policy paralysis. *Health Policy Plan*. 2014;29(6):784-794. doi:10.1093/heapol/czt055.
- Noori CM, Hama Saeed MA, Chitheer T, Ali AM, Ali KM, Jader JA, et al. Prevalence of smoking habits among the Iraqi population in 2021. *Public Health Toxicol*. 2024;4(4):20. doi:10.18332/pht/197277.
- Alotaibi SA, Durgampudi PK. Factors associated with tobacco smoking among Saudi college students: A systematic review. *Tobacco Prevent Cessation*. 2020;6:36. doi: 10.18332/tpc/122444.
- Jawad M, Lee JT, Millett C. Waterpipe tobacco smoking prevalence and correlates in 25 Eastern Mediterranean and Eastern European Countries: Cross-sectional analysis of the global youth tobacco survey. *Nicotine Tob Res*. 2016;18(4):395-402. doi: 10.1093/ntr/ntv101.
- World Health Organization. WHO report on the global tobacco epidemic, 2019: country profile United Arab Emirates. Geneva: World Health Organization; 2019.
- Sarkees AN, Issa SA. Smoking behaviors and related factors among secondary school students in Duhok city. *Iraqi J Pharmacy*. 2024;21(1):36-44. doi: 10.33899/iraqij.p.2024.145584.1077.
- Warren CW, Sinha DN, Lee J, Lea V, Jones NR. Tobacco use, exposure to secondhand smoke, and cessation counseling among medical students: cross-country data from the Global Health Professions Student Survey (GHPSS), 2005-2008. *BMC Public Health*. 2011;11:1-6. doi:10.1186/1471-2458-11-72.
- Khan FM, Husain SJ, Laeeq A, Awais A, Hussain SF, Khan JA. Smoking prevalence, knowledge and attitudes among medical students in Karachi, Pakistan. *East Mediterr Health J*. 2005;11(5-6):952-958. PMID: 16761665.
- Gupta H, Gupta S, Rozatkar A. Magnitude of substance use and its associated factors among the medical students in India and implications for medical education: A narrative review. *Indian J Psychol Med*. 2021;44:1-9. doi:10.1177/02537176211032366.
- Alkhalaf M, Suwyadi A, AlShamakhi E, Oribi H, Theyab Z, Sumayli I, et al. Determinants and prevalence of tobacco smoking among medical students at Jazan University, Saudi Arabia. *J Smok Cessation*. 2021;2021:e20. doi:10.1155/2021/6632379.
- Othman SM, Saleh AM, Ali KB. Prevalence of cigarette smoking among Hawler medical university students. *Zanco J Med Sci*. 2009;13(2):57-62. doi: 10.15218/zjms.2009.020.
- Yasso FS, Yaso SS, Yasso PS, Dafdony IV. Prevalence of cigarette smoking among medical Iraqi students. *Am J Public Health Res*. 2014;2(215):2691. doi:10.12691/ajphr-2-1-3.
- Pazdro-Zastawny K, Dorobis K, Bobak-Sarnowska E, Zatoński T. Prevalence and associated factors of cigarette smoking among medical students in Wrocław, Poland. *Risk Manag Healthc Policy*. 2022;15:509-519. doi:10.2147/RMHP.S346619.
- Imamuzzaman M, Muhammad F, Haque MI, Ahmed K, Mukta KF, Reuben RF, et al. Prevalence of smoking and its associated factors among adolescent males in Bangladesh: A community survey. *Open Public Health J*. 2022;15:e187494452211040. doi:10.2174/18749445-v15-e221115-2022-83.
- Abdelraouf MMF, Abdalla RAM, Mohamed DMS, Ahmed AKA, Abuzaid MAM, Issak MA, et al. Prevalence of smoking and its associated factors among students at the University of Dongola, Northern State, Sudan: A cross-sectional study. *Ann Med Surg (Lond)*. 2024;86(5):2543-2548. doi: 10.1097/MS9.0000000000001862.
- Todorović I, Cheng F, Stojisavljević S, Marinković S, Kremenović S, Savić P, et al. Prevalence of cigarette smoking and influence of associated factors among students of the university of Banja Luka: A cross-sectional study. *Medicina (Kaunas)*. 2022;58(4):502. doi: 10.3390/medicina58040502.
- Zubair OA. Prevalence of smoking among school students in Iraq. *Cureus*. 2024;16(8):e67048. doi:10.7759/cureus.67048.
- World Health Organization. Global Youth Tobacco Survey [Internet]. 2023 [cited 2025 Mar]. Available from: <http://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/global-youth-tobacco-survey>
- Memon MA, Ting H, Cheah JH, Thurasamy R, Chuah F, Cham TH. Sample size for survey research: review and recommendations. *J Appl Struct Equ Modeling*. 2020;4(2):1-20. doi: 10.47263/JASEM.4(2)01.
- Al-Kaabba AF, Saeed AA, Abdalla AM, Hassan HA, Mustafa AA. Prevalence and associated factors of cigarette smoking among medical students at King Fahad Medical City in Riyadh of Saudi Arabia. *J Fam Commun Med*. 2011;18(1):8-12. doi: 10.4103/1319-1683.78631.
- Jarelnape AA, Ahmed W, Omer S, Fadlala A, Ali Z, Hassan M, et al. Prevalence of smoking cigarettes and beliefs regarding smoking habits among medical students: a cross-sectional study in Sudan. *Front Public Health*. 2023;11:1193475. doi: 10.3389/fpubh.2023.1193475 25.

25. Aslan D, Ay P, Raymond K, Aşut Ö, Abuduxike G, Şengelen M, et al. Medical students' tobacco consumption status and experiences with smoke-free law violations in enclosed spaces in Türkiye and Northern Cyprus. *Thorac Res Pract.* 2025;26(2):48. doi: 10.4274/ThoracResPract.2024.24084.
26. Hassan MKR. Factors affecting urbanisation in Iraq: A historical analysis from 1921 to the present. *Urbanisation.* 2023;8(1):61–78. doi:10.1177/24557471231169386.
27. Aljunaid MA, Mehdar SA, Bukhari HS, AlSharif RH, AlSharif RH, AlHarbi S. Exploring cognitive and behavioral changes related to smoking among medical students in Saudi Arabia: A cross-sectional study. *Medicina (Kaunas).* 2024;60(12):1935. doi: 10.3390/medicina60121935.
28. Fares J, Saadeddin Z, Al Tabosh H, Aridi H, El Mouhayyar C, Koleilat MK, et al. Extracurricular activities associated with stress and burnout in preclinical medical students. *J Epidemiol Glob Health.* 2016;6(3):177–185. doi: 10.1016/j.jegh.2015.10.003.
29. Khader YS, Alsadi AA. Smoking habits among university students in Jordan: prevalence and associated factors. *East Mediterr Health J.* 2008;14(4):897-904. PMID: 19166173.
30. Boopathirajan R, Muthunaryanan L. Awareness, attitude and use of tobacco among medical students in Chennai. *J Lifestyle Med.* 2017;7(1):27-34. doi: 10.15280/jlm.2017.7.1.27.
31. Jirdi MA. Prevalence of smoking habit and associated factors among of Al-Andalus University of medical science. *Tishreen univ J Res Sci Stud Health Sci Ser.* 2018;40(5):103.
32. Alnasser AHA, Al-Tawfiq JA, Kheimi RMA, Alibrahim RMS, Albanawi NAH, Almeshal AKA, et al. Gender differences in smoking attitude among Saudi Medical students. *Asian Pac J Cancer Prev.* 2022;23(6):2089-2093. doi: 10.31557/APJCP.2022.23.6.2089.
33. Al-Kubaisy W, Abdullah NN, Al-Nuaimy H, Halawany G, Kurdy S. Epidemiological study on tobacco smoking among university students in Damascus, Syrian Arab Republic. *East Mediterr Health J.* 2012;18(7):723-727. doi: 10.26719/2012.18.7.23.
34. Von Ah D, Ebert S, Ngamvitroj A, Park N, Kang DH. Factors related to cigarette smoking initiation and use among college students. *Tob Induc Dis.* 2005;3(1):27-40. doi: 10.1186/1617-9625-3-1-27.
35. Seemadevi T, Naganandini S, Luke AM, Hamad Ingafou MS. Smoking trends and awareness among Indian University students: A qualitative study. *Heliyon.* 2025;11:e41078. doi:10.1016/j.heliyon.2024.e41078.
36. Dadipoor S, Kok G, Aghamolaei T, Heyrani A, Ghaffari M, Ghanbarnezhad A. Factors associated with hookah smoking among women: A systematic review. *Tob Prev Cessation.* 2019;5:26. doi:10.18332/tpc/110586.
37. Ahmed SM. Prevalence and perceptions toward electronic cigarettes (vaping) use among medical students: A new public health challenge in Kurdistan Region, Iraq. *J Med Chem Sci.* 2024;7(5): 720-728.
38. Eden VR, Hamid H, Das S, Dioso R. Trend and awareness of e-cigarettes among students in a private college in Sabah Malaysia. *AUIQ Compl Biol Syst.* 2024;1(2):86-95. doi: 10.70176/3007-973X.1018.
39. Ahmed LA, Verlinden M, Alobeidli MA, Alahbabi RH, AlKatheeri R, Saddik B, et al. Patterns of tobacco smoking and nicotine vaping among university students in the United Arab Emirates: a cross-sectional study. *Int J Environ Res Public Health.* 2021;18(14):7652. doi: 10.3390/ijerph18147652.
40. Castaldelli-Maia JM, Ventriglio A, Bhugra D. Tobacco smoking: From 'glamour' to 'stigma'. A comprehensive review. *Psychiatry Clin Neurosci.* 2016;70(1):24-33. doi: 10.1111/pcn.12365.
41. Al-Dhafri S. Smoking among Sultan Qaboos University students: Prevalence rates, attitudes, causes and treatment. *J Arts Soc Sci.* 2019;10(1):5.
42. Qasem NW, Al-Omouh BH, Altbeinat SK, Al-Dlajjem MM, Salahat RI, Okour SA. Smoking cessation rate and predictors of successful quitting in Jordan: A cross-sectional study. *Medicine.* 2024 ;103(27):e38708. doi:10.1097/MD.00000000000038708.
43. Al-Jayyousi GF, Shraim M, Hassan DA, Al-Hamdani M, Kurdi R, Hamad NA, et al. University students' and staff attitudes toward the implementation of a tobacco-free policy: a view from Qatar. *Prev Med Rep.* 2024;38:102605. doi: 10.1016/j.pmedr.2024.102605.