

Prevalence and Determinants of Tobacco Smoking Among University Students in Basra, Iraq: A Cross-Sectional Study

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ABSTRACT

Worldwide, smoking is a major contributor to enhanced morbidity and mortality. In addition to its social and economic consequences, student smoking has a detrimental influence on their health. Aim: The current study intends to ascertain the frequency of smoking behaviours among college students and identify associations between these behaviours and their presence. Methods: College students in Basra University, Iraq, were the primary participants in this cross-sectional, questionnaire-based study. The Global Adult Tobacco Survey (GATS) served as the primary source for the self-administered questionnaire. Sampling method through an online sending link containing a Google Form, including the main questions about the research. Findings: The study involved 409 participants; of the respondents, 49.9% were men and 50.1% were women; nevertheless, only men smoked (all female participants did not smoke). Approximately 25% of the participants smoke; 60% of them started smoking before turning 18. About 50% of students who smoke use water pipes (sheesha) either by themselves or in combination with other forms of smoking. Approximately 75% of students who smoke have knowledge of the risk that smoking poses to their health and plan to quit, mostly because of these health issues. Conclusions: Among college students at universities, smoking is comparatively common, and water-pipe smoking is particularly frequent. Increased efforts are required to raise awareness of the dangers of smoking and to provide resources for quitting.

Keywords: Tobacco smoking, college student, smoking cessation, vape, smoking habits

I. INTRODUCTION

Tobacco smoking is one of the leading causes of morbidity and mortality worldwide, and one of the significant health threats that harms people and nature. Smoking now can be named as a 'silent epidemic'(1). In the past century, tobacco smoking has led to 100 million deaths. About 5.4 million people died in a year, with an average of one person every six seconds. This ratio can exceed 8-10 million per year by 2030; approximately 70-80% of those deaths will be seen in developing countries (2-4). There is a high percentage

of smokers who live in developing countries, who account for 80% of the total 1.3 billion smokers worldwide. According to the World Health Organisation (WHO) estimates, the percentage of smokers (male or female) is lower in developed countries than in developing countries. A higher percentage lives in low- and middle-income countries, about 80% of total smokers, and their percentage is increasing, which can result in a global problem. (5).

The dangers of smoking are caused by killing its adductors through tobacco, whatever delivery way, and also considered

a significant risk factor for several diseases that cause death, such as cancer of the trachea, with 64% of deaths, nearly 16% by cardiac attacks and stroke, and other respiratory diseases can reach 38%. Additionally, it can affect fertility and cause impotence. (6) Beside its effects on conditions mentioned above, mental health problems such as depression and anxiety and data shows that giving up of smoking will help patients to be free from anxiety (7,8)

Several factors play an essential role to initiate & continue smoking habits, these are: exposure to tobacco advertisement efforts, stressful life and pressure on work or studying, effect of parents or other adults as model, inadequate knowledge about harmful effects of tobacco, concomitant drug abuse, etc. (9). Studies had revealed several factors contribute for smoking and being heavy smokers, like demographic and even genetic factors, socioeconomic factor, and influences by parents' behaviors. Students, who are considered an essential part of society, are seen to be tobacco smokers, and one of the main reasons for being a smoker is relieving tension (10). University students started smoking due to the effect of family members or friends, and more smoking friends will lead to an increased rate of being a smoker, chronically (11,12). The prevalence of tobacco cigarette smoking was seen to be increased in students who have higher living expenditures and live on a college campus away from their family home. Feeling of maturation, being a prominent member in a group, or an unstable or unhappy family environment can lead to smoking, as seen in a study made in Karbala, Iraq (13).

As this problem had grown due to the effects of different factors on this behaviour, this study aimed to measure the prevalence of smoking among college students in Basra, focusing on factors that could be minor or major reasons, and to assess the

students' general knowledge about smoking and their willingness to quit.

Material and Methods

Study design:

An observational, cross-sectional questionnaire-based study. Students from the Pharmacy College and others at Basra University, Iraq, were involved. The questionnaire was anonymous, self-administered, and primarily based on the Global Adult Tobacco Survey (GATS). The questionnaire was validated prior to its use in this study to ensure it was comfortable and more reliable for the Iraqi student population. Sample size was calculated according to Cochran's formula, where the total number of students in 2023-2024 (year of study) was 58746 students, according to the official Basrah University site, and is equal to 382

Data Collection:

An electronic questionnaire (as a Google Sheets link) was sent to students at all stages of college via the groups in the electronic programs. The data collection period was from January to April 2023. Ethical approval was obtained from the College of Pharmacy/ University of Basra with approval number: EC94

Inclusion Criteria:

Any complete answer sheet through the Google Form link was included in this study, because the questions and the required data were designed for college students.

Exclusion Criteria:

Any incomplete answer sheets by participants or incorrect data entry by them were excluded.

Statistical Analysis:

The student's responses were collected, entered into an Excel spreadsheet, and analysed using basic descriptive statistics. In addition, the t-test and chi-square are used to calculate test statistics, from which

the p-value is derived. Pearson Correlation was also calculated. The p-value is used to determine whether there's a significant difference between the two groups (a p-value less than 0.05 is considered necessary).

Results:

As shown in Table 1, the participants' demographic data were illustrated. The highest age group among the participants was 18-22 years old. Males accounted for 49% of participants, and females for 50.9%. The current living situation of the participants is as follows: about 81% live in their family home, 52% live in student dormitories, and only 5% live in their own homes. Participants from the college of pharmacy accounted for 74%, of whom 39% were at stage 4, with the remainder distributed across the four other stages. About 93% of the participants were single, and 7% were married.

Table 1: Demographic Data of the Participants

Parameter	No. (%)
Age (years)	18-22 247 (64.4%)
	23-26 141 (34.5%)
	More than 27 21 (5.1%)
Sex	Female 208 (50.9%)
	Male 201 (49.1%)
Current living	Family home 333 (81.4%)
	Student Dormitories 52 (12.7%)
	Private home 24 (5.9%)
College of study	College of Pharmacy 304 (74.3%)
	Other colleges 105 (25.7%)
Stage of study	1 st 34 (8.3%)
	2 nd 103 (25.2%)
	3 rd 33 (8.1%)
	4 th 162 (39.5%)
	5 th 78 (19%)
Marital state	Single 380 (92.9%)
	Married 29 (7.1%)
Smoking state	Smoker 103 (25.2%)
	Non-smoker 306 (74.8%)

In Table 2, the students' awareness of the negative consequences of smoking was recorded. More than 50% of the

participants all know that smoking causes cardiovascular diseases, lung cancer, and periodontal problems, while their agreement about the link between smoking and sexual disorders is only 39%.

Table 2: Students' knowledge about health conditions caused by smoking

Conditions caused by smoking	Students' knowledge [No. (%)]		
	Yes	No	Don't know
CVD	311 (75.8%)	68 (18.3 %)	31 (7.5 %)
Lung Cancer	327 (79.7%)	68 (18.3%)	15 (3.6 %)
Chronic Lung Disease	321 (78.3%)	61 (14.9%)	28 (6.8%)
Periodontal problem	330 (80.7)	50 (12.2%)	29 (7.1 %)
Sexual disorders	161 (39.3%)	106 (25.9%)	143 (34.9%)

CVD: cardiovascular disease

Table 3 presents general data on student smoking. Unfortunately, about 60% started before the age of eighteen. When asked about the type of smoking, nearly 39% were smoking cigarettes (the traditional ones), while 27% were smoking all types (cigarettes, shisha, or e-cigarettes). When asked about sheesha use, 26% reported using it daily.

In Table 4, the most common causes of smoking initiation are presented. About 50% used smoking for relaxation, 22% attributed the reason to studying and stress, and 13.6% attributed the reason to socioeconomic factors for starting smoking.

Table 5 presents the relationship between monthly income and smoking status. There was no significant association ($p=0.36$) between income and smoking status.

Table 3: Smokers' Data about smoking behavior

Parameter	No. (%)	
Age of smoking starting	Before 18 years	39 (37.8%)
	age 18 years and older	64 (62.2%)
Type of smoking	Cigarette	33 (32.1%)
	Sheesha	27 (26.2%)
	e. cigar	2 (1.9%)
No. of cigarette/day	All types	41 (39.8%)
	Smoker but not daily	37 (35.9%)
	1-10 cigarettes	17 (16.5%)
	11-20 cigarettes	23 (21.1%)
	21-30 cigarettes	14 (12.8%)
	More than 30	12 (11.6%)
Times of sheesha	Daily	27 (39.7%)
	once or twice a week	18 (26.4%)
	once or twice a month	9 (13.2%)
	smoking sheesha intermittently	25(36.7%)

Table 6 presents the relationship between college study stage and smoking status. Positive relationship with a significant level ($p=0.01$). As students get to the final stages, their smoking habits increase.

Table 7 illustrates the relation between residence place and becoming a smoker. There was a significant relation ($p=0.0001$). From the data, being at the family home is associated with a higher rate of smoking.

Table 4: Causes of Smoking

Cause of smoking	No. (%)
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Enjoy and relaxation	52 (50.5%)
Studying and exam stress	23 (22.3%)
Socioeconomic factors	14 (13.6%)
Advertisement and media	14 (13.6%)

Table 5: The Relation Between Participants' Monthly Income and Smoking Status

Monthly income	Non smoker	smoker	P-value
Low	31 (64.6%)	17 (35.4%)	0.36
Moderate	149 (76.4%)	46 (23.6%)	
Good	108 (76.6%)	33 (23.4%)	
Excellent	19 (73.1%)	7 (26.9%)	

Table 6: The Pearson Correlation Between Participants' Education Level and Smoking Status

Educational stage	Non smoker	smoker	P-value
First	25 (73.5%)	9 (26.5%)	0.01*
Second	89 (86.4%)	14 (13.6%)	
Third	22 (66.7%)	11 (33.3%)	
Fourth	121 (74.7%)	41(25.3%)	

Fifth	50 (64.1%)	28 (35.9%)
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*: significant when p-value <0.

Table 7: The Relation Between Participants' Residence Place and Smoking State

Students' place of residence	Non smoker	smoker	P-value
Private home	10 (41.7%)	14 (58.3%)	0.0001*
Family home	260 (77.8%)	74 (22.2%)	
Students' dormitories	37 (71.2%)	15 (28.8%)	

*: significant when p-value <0.05

Discussion:

Tobacco smoking, particularly among university students, is an important issue worldwide. This present study aims to look for the predominance of smoking and evaluate the knowledge, awareness, and smoking behaviour in university students in Basra. The percentage (49.1%) was male and between 18 and 26 years old. In Table 2, most students in this study have a good understanding of the negative consequences of smoking, including lung cancer, chronic obstructive airway disease, as well as cardiovascular and periodontal disease. Still, they are uncertain of its association with sexual disorders. Such findings were reported by Parmer MP et al. (2023) (14). Instead of stopping smoking after learning about the harmful effects, they still smoke due to several factors that will be mentioned in this article.

This study estimates the prevalence of smoking (at least one type of smoking, cigarette, sheesha, or electronic cigarette)

and found that about 25% of participants smoke at the University of Basra, especially college of pharmacy students. This relatively high rate of smoking is compared with other studies in Iraq. A previous study found that approximately 10.5% of students at Karbala University smoked, and 4.4% smoked Sheesha. (13). Another study shows that the smoking prevalence rate of 23.5% at four universities in Duhok City (15) and about 11.1% at Sulaimani University (16), also in Portugal, a study was made on students in college, and the prevalence was near the findings of our study (17). Smoking among Iraqi college students was comparable to that of the majority of regional countries. A meta-analysis in Saudi Arabia found a prevalence rate of 26% among male students (18). Increasing prevalence of smoking among university students is also seen in Iranian university students, as shown in Khodadost et al.'s meta-analysis study, which shows that the pooled prevalence of cigarette smoking at least once in the lifetime was 19% (19). A cross-sectional survey at Birmingham University found that the use of tobacco control policies has the potential to be an effective strategy for the reduction of smoking prevalence and secondhand smoke exposure in tertiary educational settings (20). The prevalence is thought to be higher because the data were self-reported, and some information may not have been included.

In the latter study, smoking prevalence was 14%, which is lower than the rate of smoking observed in this study and is similar in Middle Eastern countries. This clarifies the importance of supporting a smoke-free or comprehensive tobacco-free campus policy.

The present research also showed that about 37.8 % of smoking students started smoking at a young age (before the age of 18 years), as shown in Table 3. This is lower than that reported in previous studies at Karbala Medical University (45.7%) and

Hawler Medical University (50%) (13, 14), respectively. Even though it is lower than the comparable studies, it is explained by the overall increase in smoking rate in Iraqi youth, even before being accepted into university. Starting smoking at a young age is considered an essential factor that affects cigarette consumption and smoking cessation techniques in adults, and also a sign of getting diseases early, besides complications, economic problems.

A study in the USA found that regular smoking between the ages of 18 and 20 was linked to a higher risk of nicotine dependence and a reduced likelihood of trying and planning to stop. (21). The study also evaluates the type of smoking among tobacco users. About 32% of smoking students utilize the classical cigarette. However, there is an increase in water pipe smoking (WPS, sheesha or narghile) to about 26%. Furthermore, 39% of students use all types of smoking. This result reveals the increase in use of newer types of tobacco, especially water pipe, and to a lesser extent, e-cigarettes, possibly due to the latter's high cost and widely spread pipe shops that sell.

The use of the water pipe-smoking device is increasing at a large scale in Iraq as well as in surrounding Arab countries. The users are exposed to a wide range of chemical compounds. They may lead to a variety of health problems related to wrong ideas about sheesh, which they thought of as having lower complications, which advertise their safety over classic cigarettes. Water pipe smokers are exposed to higher levels of toxic compounds compared to classic cigarettes, which will lead to more severe health problems, in addition to increased risks of infection transmission (22).

In the current study, about 65% of smokers take a water pipe with or without other smoking devices. This trend of narghile use could be explained by the false belief that

they are less dangerous than cigarettes and that they come in a variety of enticing flavors. A similar study at Duhok University in Iraq found a water pipe smoking prevalence of about 33.2% (56.7% among males and 11.8% among females), and there is a significant correlation between cigarette smoking and WPS (23). Friends' enjoyment and relaxation were considered the primary reason (50%) for starting smoking, followed by study and exam stress, and then socioeconomic factors and advertisement, as shown in Table 4. Students, unfortunately, use the undesirable behavior of smoking as a strategy to cope with stress and social anxieties rather than beneficial habits such as reading books or playing sports.

In Table 5, Pearson's correlation was used to assess the association between smoking habits and monthly income, and the result was non-significant. Students with low income accounted for 35% of smokers, while those with moderate, good, and excellent income accounted for 33%, 47%, and 7%, respectively—even if non-significant. Still, the moderate-good income was higher than the low and excellent incomes. Similar results had been seen in Perelman J et al, 2017, where a study made in six European countries took adolescent people and the study revealed a positive correlation between smoking habit and monthly income (24). This positive correlation is due to the cost of visiting cafés, buying cigarettes, or vaping, which are available in almost all areas of Basra City.

The results in Table 6, which explain the relation between the stage of study in college and smoking habit, show a significant result for this parameter. In the 5th stage, 35.9% were smokers, compared with 26% in the 1st stage of college. Such results were reported by Naser A et al. (2019), who concluded that the percentage of smokers increased with study stage (25). This study gave a cause for this, which is

due to prolonged exposure of students to older smoker students and the attitude is spread among them. In addition, older students' feelings toward younger student leaders and their thoughts about smoking will enhance their confidence.

Finally, Table 7 shows smoking habits and their relationship with place of residence. The students who lived in private homes were (41%) non-smokers, and (58%) smokers; those who lived in family homes were (77%) non-smokers, and (22%) smokers; and those who lived in students' dormitories were (28%) smokers and (71%) non-smokers. Here, the percentage of non-smokers who lived with their family is higher than those who live in a private home (77% and 41%, respectively) and this can give impaction about family role in avoid smoking or quitting it beside of feeling with degree of stability that, if not present, is considered one of the initial factors that will lead to smoking.

In addition, tobacco control measures could also include higher cigarette prices and /or increase taxes on their import process, aid smoke-free organization, decrease the cost of smoking cessation medication like (nicotine replacement product), community-based stop smoking activities, increase education programs regarding to improve the students' awareness about the harmful consequences of smoking, among others, it may be helpful to find a new approaches targeting the university students, to reduce smoking in this critical population group in our society.

The study's limitations include the inability to access vital information from all university students and the underrepresentation of some college students (fewer participants relative to the university's size). In addition, volunteer bias could lead to under- or overestimation of prevalence estimates, especially among females, possibly due to family and social restrictions.

Conclusions

In Basra/Iraq, university students smoke tobacco rather frequently, with a high prevalence of water-pipe or sheesha smoking. They are highly aware of the negative effects of tobacco use, and smoking prevalence correlates with educational attainment. To assist people in quitting smoking, more education and awareness programs about the negative effects of tobacco use are required

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Conflict of interest:

The authors declare no conflict of interest

Ethical approval:

The study was approved by the Ethics Committee of the College of Pharmacy/ University of Basrah, with the approval number [EC94]

Data Availability:

All relevant data are included within the article

Authors Contributions:

NKM.Jawad wrote the manuscript, NM. Abdulrahman had arranged the results and general manuscript adjustments; ST made a revision to the manuscript and conducted a plagiarism test. All authors helped in collecting data. All authors reviewed and approved the final manuscript

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