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FREQUENCY OF WATERPIPE SMOKING AND ITS ASSOCIATED FACTORS AMONG MEDICAL STUDENTS

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Abstract

Background: *Waterpipe smoking, commonly known as shisha or hookah, has gained popularity among young adults, especially medical students, due to its social appeal and perceived harmlessness.*

Objectives: *To determine the frequency and associated factors of waterpipe smoking among medical students and assess the role of social, psychological, and demographic influences.*

Study Design & Setting: *A cross-sectional study was conducted at Community Medicine Department of Sheikh Zayed Medical College, Rahim Yar Khan from 3 January 2025 to 3 April 2025.*

Methodology: *A sample size of 90 participants was selected through convenience sampling. Data were collected using a structured questionnaire that included demographic information and questions related to waterpipe smoking frequency, social and peer influence, perceived harmlessness, stress relief, curiosity, family background, and the influence of flavored tobacco. Stratification was performed based on age, gender, and academic year, and the association between factors and smoking status was assessed using the chi-square test, with a p-value ≤ 0.05 considered statistically significant.*

Results: *The mean age of participants was 24.2 ± 3.1 years. The prevalence of waterpipe smoking was 54.4%. Social and peer influence (p = 0.002), perceived harmlessness (p = 0.019), and stress relief (p = 0.025) were significantly associated with smoking behavior. Flavored tobacco availability and curiosity also contributed to the prevalence of smoking among students.*

Conclusion: *Waterpipe smoking is prevalent among medical students, driven by social interactions, stress relief, and the misconception of reduced harm compared to cigarettes. There is a need for awareness campaigns to educate students about the associated health risks and address misconceptions regarding waterpipe smoking.*

INTRODUCTION

Waterpipe smoking referred to as shisha, hookah or narghile is a conventional way of tobacco intake that has seen a significant resurgence globally, particularly among young adults.[1] Every year tobacco use is

responsible for 4.9 million deaths worldwide, with 70 percent of these fatalities occurring in countries that are developing. Figures indicate that tobacco-related fatalities are anticipated to increase from 5.4 million in 2005 to 6.4 million in 2015, and further to 8.3 million by 2030. The practice involves inhaling smoke generated by heating tobacco, often flavored, through a water basin.[2,3]

Waterpipe smoking has been notably raised in students of medical, a demographic that is paradoxically expected to possess a greater knowledge of the health concerns linked to tobacco consumption.[4] Several factors have been identified in the literature as a factor in the high rate of smoking water pipes among medical students. Social influences, including peer pressure and social acceptance of waterpipe use, play a significant role. The social aspect of waterpipe smoking promotes it a popular social activity, often associated with social gatherings and leisure time.[5]

Psychological factors such as stress and academic pressure are also pertinent. Medical students frequently face elevated stress levels owing to the rigorous requirements for their education, which may lead some to seek coping mechanisms, including smoking. Furthermore, exposure to smoking behaviors within the clinical environment and the normalization of smoking in certain cultural contexts can influence students' attitudes towards waterpipe smoking.[6]

The prevalence and patterns of waterpipe (shisha) smoking among medical students in Pakistan have been explored in various studies, revealing significant insights into the behavior and its associated factors. Khan et al. reported that 22.7% of the students indicated that they smoke shisha.[7] Fagbule et al. (2022) found that twenty-two (8.7%) respondents had used shisha.[8]

The findings will provide valuable insights into the patterns of tobacco use in this population and inform the development of effective educational and preventive strategies. Understanding the dynamics of waterpipe smoking among medical students is crucial, as it addresses not only the immediate health risks but also the broader implications for public health advocacy and tobacco control efforts. Medical students, as future healthcare professionals, play a pivotal role in shaping societal attitudes toward smoking. Thus, addressing waterpipe smoking in this group is essential for fostering a generation of health-conscious physicians who can lead by example in the fight against tobacco-related morbidity and mortality.

MATERIALS AND METHODS

After obtaining synopsis approval from CPSP and receiving permission from the institutional research committee, this cross-sectional study was conducted in the Community Medicine Department of Sheikh Zayed Medical College, Rahim Yar Khan from 3 January 2025 to 3 April 2025. Informed consent was obtained from all participants, and their anonymity and confidentiality were maintained throughout the study. Sample size of 90 cases is calculated with 5% margin of error and 95% confidence level while taking expected frequency of waterpipe smoking (sheesha) to be 8.7% in medical students.[8] The inclusion criteria were medical students of both genders, enrolled in the MBBS program from 1st to 5th year at Sheikh Zayed Medical College, Rahim Yar Khan, who were willing to participate and provide informed consent. Exclusion criteria were students not enrolled in the MBBS program, those with incomplete responses, chronic respiratory diseases, ongoing smoking cessation treatments, or temporary enrollment as exchange students. Data were collected using a proforma containing age, gender, academic year, and waterpipe smoking status. Operational definitions were established to standardize data collection. Frequency of waterpipe smoking was classified as daily (at least once per day), weekly (at least once per week but less than daily), or monthly (at least once per month but less than weekly), and occasional (less than once a month), with each session lasting at least 30 minutes. Social and peer influence was considered positive if students reported smoking primarily in social settings or as a result of peer influence. Perceived harmlessness was noted as positive if students agreed that waterpipe smoking was less harmful than cigarettes. Stress relief was categorized as positive if smoking was reported as a coping mechanism for academic stress. Curiosity and experimentation were identified as motivating factors if students reported trying waterpipes out of curiosity or to experience something new. Family background was considered relevant if a family member smoked and influenced

the student's behavior. Gender differences were analyzed to assess smoking patterns among male and female students. Flavored tobacco was noted as a motivating factor if students preferred smoking due to the availability of different flavors. Data on social and peer influence, perceived harmlessness, stress relief, curiosity, family background, gender differences, and flavored tobacco were labeled as per operational definitions. To minimize bias, anonymity of responses was ensured, and a structured questionnaire was used to standardize data.

All data collected were input into SPSS version 25. Numerical data, including age, were reported as mean ± standard deviation (SD) and (IQR). The Shapiro-Wilk test was employed to evaluate normality. Categorical variables, including gender, academic year, waterpipe smoking (yes/no), and associated factors (social and peer influence, perceived harmlessness, stress relief, curiosity, family background, gender differences, and flavored tobacco), were presented as frequency and percentage. Data were stratified by age, academic year, gender and variables to account for effect modifiers. A post-stratification chi-square test was conducted, with a significance threshold set at a p-value of ≤ 0.05.

RESULTS

The mean age of the participants was 24.2 ± 3.1 years. The age group were of 21 - 25 years (50, 55.6%), followed by those aged ≤ 20 years (28, 31.1%) and > 25 years (12, 13.3%). In terms of gender distribution, most participants were male (55, 61.1%), while females comprised 35 (38.9%) of the study population. Regarding the academic year of MBBS study, the highest proportion of students were from the 4th year (22, 24.4%), followed by 2nd year (20, 22.2%), 1st year (18, 20.0%), and equal representation from the 3rd and 5th years (15 each, 16.7%). As given in Table 2, smoking waterpipe (49, 54.4%), while the remaining 41 (45.6%) stated that they did not smoke waterpipe.

As shown in Table 3, among the participants who smoked waterpipe (n=49), the most common frequency of smoking was daily (12, 24.5%), followed by weekly (11, 22.4%), monthly (10, 20.4%), and occasionally (9, 18.4%). A smaller proportion (7, 14.3%) reported smoking waterpipe for the first time.

As given in Table 4, social and peer influence played a significant role in waterpipe smoking, with 30 (61.2%) students reporting smoking primarily in social settings and 25 (51.0%) being influenced by peers. Regarding perceived harmlessness, 15 (30.6%) strongly agreed and 12 (24.5%) agreed, while 10 (20.4%) neutral, 8 (16.3%) disagreed, and 4 (8.2%) strongly disagreed. Stress relief was cited as a reason for smoking by 22 (44.9%) students, while 27 (55.1%) denied this reason. Curiosity was a motivating factor for 26 (53.1%) students, and among those who smoked to try something new, 14 (28.6%) did so often, 18 (36.7%) sometimes, 11 (22.4%) rarely, and 6 (12.2%) never. Family background influence was present in 24 (49.0%) cases, but only 20 (40.8%) reported being influenced by family members who smoked waterpipes. Gender differences were perceived by 29 (59.2%) students, with 21 (42.9%) believing that males smoke more often than females (8, 16.3%). Lastly, flavored tobacco was identified as a significant factor, with 22 (44.9%) often smoking because of flavor availability, 14 (28.6%) sometimes, 8 (16.3%) rarely, and 5 (10.2%) never considering it as a factor.

As shown in Table 5, Among the age groups, the highest prevalence of waterpipe smoking was observed in the 21-25 years age group (28, 31.1%), followed by those aged ≤ 20 years (12, 13.3%) and > 25 years (10, 11.1%). Gender-wise, smoking was more common among males (30, 33.3%) compared to females (20, 22.2%). Regarding academic year, the highest frequency of smokers was observed among 3rd-year students (15, 16.7%), followed by 4th-year (12, 13.3%), 2nd-year (10, 11.1%), 5th-year (8, 8.9%), and 1st-year (5, 5.6%) students. The significant p-values indicate that age, gender, and academic year are statistically significant factors influencing waterpipe smoking.

As shown in Table 2, Participants who reported social and peer influence as a factor were more likely to smoke waterpipe (35, 38.9%) compared to those without such influence (15, 16.7%). Similarly, perceived harmlessness was significantly associated with waterpipe smoking (p = 0.019). A higher proportion of smokers strongly agreed or agreed that waterpipe smoking is less harmful compared to

cigarettes (28, 31.1%), while a smaller proportion disagreed or strongly disagreed (10, 11.1%). Stress relief was also significantly associated with waterpipe smoking (p = 0.025). Participants who smoked for stress relief were more likely to be smokers (30, 33.3%) than non-smokers (10, 11.1%). These findings indicate that social and peer influence, perceived harmlessness, and stress relief are significant factors influencing waterpipe smoking among the participants.

Table 1: Participants' demographic characteristics (n = 90)

Variables	Characteristic	Frequency (%)
Age	Mean±SD	24.2 ± 3.1
	≤ 20	28 (31.1%)
	21 - 25	50 (55.6%)
	> 25	12 (13.3%)
Gender	Male	55 (61.1%)
	Female	35 (38.9%)
Year of MBBS Study	1st Year	18 (20.0%)
	2nd Year	20 (22.2%)
	3rd Year	15 (16.7%)
	4th Year	22 (24.4%)
	5th Year	15 (16.7%)

Table 2: Waterpipe Smoking Status (n=90)

Smoking Status	Frequency (%)
Yes	49 (54.4%)
No	41 (45.6%)

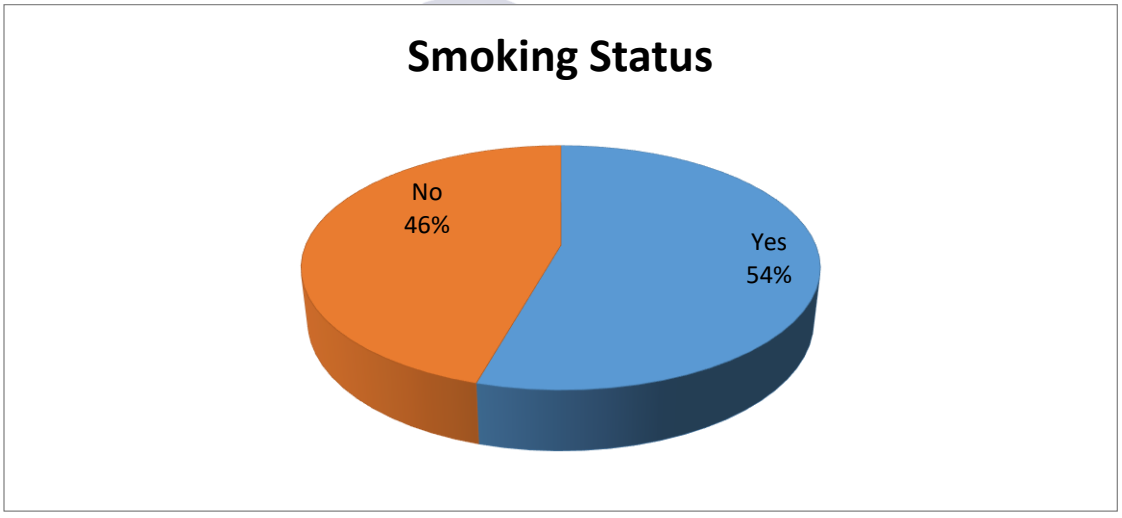

Figure 1: Waterpipe Smoking Status (n=90)

Table 3: Frequency of Waterpipe Smoking Among Smokers (n=49)

Frequency	Frequency (%)
Daily	12 (24.5%)
Weekly	11 (22.4%)
Monthly	10 (20.4%)

Occasionally	9 (18.4%)
First Time	7 (14.3%)

Table 4: Frequency and Distribution of Associated Factors Influencing Waterpipe Smoking among Medical Students (n=49)

Factor	Question	Response	Frequency (%)
Social and Peer Influence	Do you primarily smoke waterpipe in social settings?	Yes	30 (61.2%)
		No	19 (38.8%)
	Do your peers influence your decision to smoke waterpipe?	Yes	25 (51.0%)
		No	24 (49.0%)
Perceived Harmlessness	Do you believe waterpipe smoking is less harmful than cigarette smoking?	Strongly Agree	15 (30.6%)
		Agree	12 (24.5%)
		Neutral	10 (20.4%)
		Disagree	8 (16.3%)
		Strongly Disagree	4 (8.2%)
Stress Relief	Do you smoke waterpipe to relieve academic or personal stress?	Yes	22 (44.9%)
		No	27 (55.1%)
Curiosity and Experimentation	Did you start smoking waterpipe out of curiosity?	Yes	26 (53.1%)
		No	23 (46.9%)
	How often do you smoke waterpipe to try something new?	Often	14 (28.6%)
		Sometimes	18 (36.7%)
		Rarely	11 (22.4%)
		Never	6 (12.2%)
Family Background Influence	Do any of your family members smoke waterpipe?	Yes	24 (49.0%)
		No	25 (51.0%)
	Has their behavior influenced your decision to smoke waterpipe?	Yes	20 (40.8%)
		No	29 (59.2%)
Gender Differences	Do you think waterpipe smoking is more common among a specific gender?	Yes	29 (59.2%)
		No	20 (40.8%)
	If yes, which gender do you think smokes more often?	Male	21 (42.9%)
		Female	8 (16.3%)
Flavored Tobacco	Do you smoke waterpipe because of the availability of different flavors?	Often	22 (44.9%)
		Sometimes	14 (28.6%)
		Rarely	8 (16.3%)
		Never	5 (10.2%)

Table 5: Stratification of Waterpipe Smoking by Age Group, Gender, and Academic Year

Variable	Category	Waterpipe Smoking (Yes)	Waterpipe Smoking (No)	p-value
Age Group (years)	≤ 20	12 (13.3%)	15 (16.7%)	0.031
	21 - 25	28 (31.1%)	20 (22.2%)	
	> 25	10 (11.1%)	5 (5.6%)	
Gender	Male	30 (33.3%)	20 (22.2%)	0.047
	Female	20 (22.2%)	20 (22.2%)	
Academic Year	1st Year	5 (5.6%)	10 (11.1%)	0.015
	2nd Year	10 (11.1%)	8 (8.9%)	
	3rd Year	15 (16.7%)	12 (13.3%)	

	4th Year	12 (13.3%)	6 (6.7%)	
	5th Year	8 (8.9%)	4 (4.4%)	
Total		50 (55.6%)	40 (44.4%)	

Table 2: Association between Waterpipe Smoking and Associated Factors

Factor	Response	Waterpipe Smoking (Yes)	Waterpipe Smoking (No)	p-value
Social and Peer Influence	Yes	35 (38.9%)	10 (11.1%)	0.002
	No	15 (16.7%)	30 (33.3%)	
Perceived Harmlessness	Strongly Agree/Agree	28 (31.1%)	10 (11.1%)	0.019
	Neutral	12 (13.3%)	18 (20.0%)	
	Disagree/Strongly Disagree	10 (11.1%)	12 (13.3%)	
Stress Relief	Yes	30 (33.3%)	10 (11.1%)	0.025
	No	20 (22.2%)	30 (33.3%)	
Total		**50 (55.6%)**	**40 (44.4%)**	

DISCUSSION

Waterpipe smoking, referred to as shisha or hookah, has become a prevalent social activity among young adults, especially medical students. Although regarded as less detrimental than cigarette smoking, waterpipe usage presents considerable health hazards, encompassing respiratory and cardiovascular ailments.[9] The social acceptance and availability of flavored tobacco make it appealing to students, who often underestimate its detrimental effects. Peer influence, stress relief, and curiosity further contribute to the increasing incidence of waterpipe smoking in educational environments.[10,11] Understanding the factors that drive this behavior among medical students is crucial for designing targeted awareness and prevention strategies.

Our findings reveal that 55.6% of students reported waterpipe smoking, with a higher prevalence among males (33.3%) compared to females (22.2%), consistent with previous studies. Haroon et al. (2014) reported that although 86.6% of participants were aware of shisha smoking hazards, curiosity (31.4%) and social trends (29.2%) were the primary reasons behind smoking, aligning with our finding that social and peer influence played a major role (38.9%).[12]

Similarly, Zavery et al. (2017) reported that 21.5% of medical students smoked shisha, with a significantly higher prevalence among males (54.26%), which is consistent with our results showing a higher prevalence among male students (33.3%) compared to females (22.2%).[13] Asif et al. (2017) also demonstrated a high familiarity rate (94.1%) and a notable prevalence of waterpipe use (36%), where private sector students were significantly more involved, resonating with our findings indicating that social acceptance plays a vital role.[14]

Our study's results also corroborate Babar et al. (2015), who reported that 36% of medical students smoked shisha, with 40.5% initiating smoking for fun and 19.5% out of curiosity.[15] Fagbule et al. (2022) reported that male gender and peer influence were significant predictors of waterpipe use, which aligns with our study's observation of higher prevalence among males and the impact of social factors.[16] Moreover, our study reflects findings from Momeni et al. (2019), where 30% of students reported waterpipe consumption mainly for entertainment and curiosity, emphasizing the role of social settings and peer influences.[17] Furthermore, Maraqa et al. (2024) highlighted high waterpipe smoking dependence (69.4%) among university students, driven by social factors and daily smoking frequency.[18,19] Our study also indicated that social influence is a significant factor (p=0.002), emphasizing the importance of targeting social networks in prevention efforts.

Stress relief as a motivation for smoking (33.3%) in our study aligns with findings from Hawash et al. (2022), where stress was identified as a major cause of smoking initiation among medical students after joining college.[20,21] Additionally, Hanfi et al. (2024) highlighted the global challenge of tobacco use among medical students, with rates ranging from

6.7% to 17.8% in developing countries, consistent with our findings demonstrating considerable prevalence among medical students.[22]

Efforts should be made to create targeted interventions, including awareness campaigns and peer education programs, to address misconceptions about the perceived harmlessness of waterpipe smoking and mitigate its prevalence among the future healthcare workforce. The use of stratified analysis by age, gender, and academic year enhances the robustness of the findings. Additionally, the study's focus on perceived harmlessness and stress relief offers a comprehensive understanding of motivational factors. However, the cross-sectional design limits causality inference. The study's sample size, though adequate, may not fully represent medical students from diverse backgrounds or institutions. Further longitudinal studies are recommended to assess changes in smoking behavior over time.

CONCLUSION

Waterpipe smoking among medical students is significantly influenced by social interactions, perceived harmlessness, and stress relief. Awareness campaigns addressing misconceptions and educating students on health risks are essential to reduce prevalence and promote healthier behaviors.

REFERENCES

1. Münzel T, Hahad O, Kuntic M, Keaney Jr JF, Deanfield JE, Daiber A et al. Effects of tobacco cigarettes, e-cigarettes, and waterpipe smoking on endothelial function and clinical outcomes. Eur Heart J. 2020;41(41):4057-70.
2. Adetona O, Mok S, Rajczyk J, Brinkman MC, Ferketich AK. The adverse health effects of waterpipe smoking in adolescents and young adults: a narrative review. Tob Induc Dis. 2021;19:1-10.
3. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med. 2016;3(11):201-12.
4. Büyüker SM, Bahçekapılı İ. Waterpipe, cigarette, and tobacco products smoking among university students: A cross-sectional study. Addicta Turk J Addict. 2023;10(3):123-30.
5. Abdullah RY, Ramadhan DS, Sarkees AN, Tahir AI, Kadhim SJ. Knowledge, attitudes, and practices towards waterpipe smoking among medical and non-medical university students. Mosul J Nurs. 2024;12(1):45-52.
6. Naseeb U, Alam MT, Pervez F, Mustafa MS, Azam U, Laila S et al. Knowledge, attitude, and perception of passive smoking among medical and dental students of Karachi: A survey-based study. Tob Use Insights. 2024;17:1179173X241258347.
7. Khan N, Siddiqui MU, Padhiar AA, Hashmi SA, Fatima S, Muzaffar S. Prevalence, knowledge, attitude and practice of shisha smoking among medical and dental students of Karachi, Pakistan. J Dow Univ Health Sci. 2008;2(1):3-10.
8. Fagbule OF, Cadmus EO. Predictors of shisha use among medical and dental students in Ibadan, Nigeria. Niger J Clin Pract. 2022;25(7):979-86.
9. Badran M, Laher I. Waterpipe (shisha, hookah) smoking, oxidative stress and hidden disease potential. Redox biology. 2020 Jul 1;34:101455.
10. Qasim H, Alarabi AB, Alzoubi KH, Karim ZA, Alshbool FZ, Khasawneh FT. The effects of hookah/waterpipe smoking on general health and the cardiovascular system. Environmental health and preventive medicine. 2019 Dec;24:1-7.
11. Darawshy F, Rmeileh AA, Kuint R, Berkman N. Waterpipe smoking: a review of pulmonary and health effects. European Respiratory Review. 2021 May 11;30(160):465-69.
12. Haroon M, Munir A, Mahmud W, Hyder O. Knowledge, attitude, and practice of water-pipe smoking among medical students in Rawalpindi, Pakistan. J Pak Med Assoc. 2014;64(2):155-8.
13. Zavery A, Qureshi F, Riaz A, Pervez F, Iqbal N, Khan JA. Water pipe (shisha) use and legislation awareness against shisha smoking among medical students: a study from Karachi, Pakistan. J Community Health. 2017;42(4):461-5.

14. Asif A, Sarfraz K, Paracha M, Saleem F. To assess the prevalence & factors associated with shisha smoking in medical students. J Med Sci. 2017;25(2):268-72.
15. Babar NF, Riaz S. Prevalence and factors associated with sheesha smoking in a sample of medical students. J Postgrad Med Inst. 2015;29(3):151-60.
16. Fagbule OF, Cadmus EO. Predictors of shisha use among medical and dental students in Ibadan, Nigeria. Niger J Clin Pract. 2022;25(7):979-86.
17. Momeni M, Sharifi P, Ghari E, Safizadeh H. Frequency of waterpipe smoking and its effective factors among students of state universities in Kerman, Iran. Russian Open Medical Journal. 2019;8(2):204.
18. Hussain I, Bashir A, Khan B, Sirhindi GA. Frequency of Shisha Smoking among the Medical and Dental Students with Habit of Smoking. Pakistan Journal of Medical & Health Sciences. 2015 Apr 1;9(2):729-30.
19. Maraqa B, Nazzal Z, Baker NA, Khatib H, Zeyad M, Aburayyan O. Factors contributing to the rising prevalence of waterpipe smoking dependence among university students: a cross-sectional study. BMC Medical Education. 2024 Feb 20;24(1):164-169.
20. Hawash M, Mosleh R, Jarrar Y, Hanani A, Hajyousef Y. The prevalence of water pipe smoking and perceptions on its addiction among university students in Palestine, Jordan, and Turkey. Asian Pacific Journal of Cancer Prevention. 2022 Apr;23(4):1247-51.
21. Hafeez OA. Factors and frequencies associated with cigarette smoking initiation in undergraduate medical students. Pak J med Health Sci. 2019;13;(2):490-95.
22. Hanfi H, Ahmad AQ, Ahmad W, Masroof U, Khan D, Khan SA, Rehman A, Suleman M. Frequency and Risk Factors of Cigarette Smoking Among Male Medical Students of Bacha Khan Medical College, Mardan. International journal of health sciences.2024;8(S1):569-78.