ORIGINAL ARTICLE

CONTENTS

Examine attitudes and knowledge of the harmful effects of waterpipe tobacco smoking among Thi-Qar university students

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ABSTRACT

Aim: To examines the knowledge, attitudes, and behaviors of nursing students in Iraq about WTS.

Materials and Methods: A cross-sectional study was conducted from February to May 2025 including 410 nursing students at Thi-Qar University, employing a validated English questionnaire. We employed SPSS v26 ($p<0.05$ significant) to analyze the data using chi-square testing.

Results: The prevalence of current WTS was 13.2% (n=54), predominantly male (92.6% of smokers). Smokers had significantly higher mean age (24.2 vs 21.5 years, $p<0.001$) and were more likely to be in later academic years (68.5% vs 36.3%, $p<0.001$). While 81.5% of smokers recognized nicotine content, 68.5% erroneously believed WTS was less addictive than cigarettes. Significant knowledge gaps existed regarding tar content (only 63.0% smokers acknowledged) and toxin filtration (40.7% believed water filters toxins). Attitudinally, smokers were more likely to view WTS as socially advantageous (51.9% believed it increased friendships vs 21.1%, $p<0.001$).

Conclusions: The significant prevalence of waterpipe tobacco smoking (WTS) among nursing students at Thi-Qar University, along with the associated misconceptions, constitutes a critical public health issue, undermining both their health and their effectiveness as patient role models. Our findings indicate the need for the prompt incorporation of a focused educational module into the nursing curriculum that specifically dispels WTS misconceptions and examines its social drivers.

KEY WORDS: waterpipe, nursing students, shisha

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INTRODUCTION

Shisha, or waterpipe tobacco smoking (WTS), is increasingly prevalent globally, particularly in Arab countries where it is socially endorsed and integrated into popular culture [1]. Since 2015, the global prevalence of young individuals who smoke WTS has increased by 40%. Recent meta-analyses reveal that the global rate of youth who smoke WTS is 12% in 2023, but it is much higher in Arab nations. Lebanon has the highest rate at 37.2%, followed by Jordan at 28.6% and Iraq at 26.4% [2].

WTS prevalence is significantly higher among university students in Arab nations compared to other countries. Egypt exhibits a rate of 46.7%, while Kuwait shows a rate of 46% [3]. In the United States, 30.5% of college students with a history of smoking and 8.4% of current smokers reported experiencing WTS [4]. The prevalence of WTS among university students in Saudi Arabia ranged from 36.4% to 36.3% [3]. A study conducted in Palestine, Jordan, and Turkey found that 31.8% of students engage in WTS. The prevalence of WTS was highest in Palestine, with 36.11% of the students engaging in this behavior [5]. A study conducted in Iraqi Kurdistan showed that 28% of university students engage in WTS, with a notable gender disparity: 49% male compared to 10% female [6].

According to previous studies, a significant number of university students believe WTS is less hazardous than cigarette smoking, leading to increased consumption [7–9]. Other studies show that university students often don't know enough about the health dangers of WTS, such lung cancer and respiratory disorders [10–12]. Previous studies showed that many university students also believe it's easy to quit WTS, yet a lot of them have trouble quitting so [8]. Social and cultural factors are very important in initiating and continuing WTS among students [8]. Many people think that WTS is a more social activity, which is a primary reason why it is so popular [9]. Individuals who used WTS in both Arab and Western societies, as well as college students and teenagers, had this perspective [7]. Additionally, numerous individuals believe that public health efforts that attempt to educate students about the harmful effects of WTS have not been enough [8]. A preliminary study shows that nurses lack sufficient knowledge regarding how WTS impacts health [11]. This might make it more difficult for them to carry out duties

Table 1. Socio-demographics of study participates

Characteristics	Waterpipe Smoker			P- value
	Yes (N = 54) n (%)	No (N = 356) n (%)	All (N = 410) n (%)	
Age (Mean + SD)	24.2 + 4.6	21.5 + 3.6	21.9+ 3.9	< 0.001
Age group				
18-19.9	3 (6.5)	110 (30.9)	113 (27.6)	< 0.001
20-24.9	32 (59.3)	201 (56.5)	233 (56.8)	
>25	19 (35.2)	45 (12.6)	64 (15.6)	
Gender				
Male	50 (92.6)	100 (28.1)	150 (36.6)	< 0.001
Female	4 (7.4)	256 (71.9)	260 (63.4)	
Year of study				
1st and 2nd	17 (31.5)	227 (63.8)	244 (59.5)	< 0.001
3rd and 4th	37 (68.5)	129 (36.3)	166 (40.5)	
Marital status				
Single	36 (66.7)	312 (87.6)	348 (84.9)	< 0.001
Married	13 (24.1)	39 (11.0)	52 (12.7)	
Divorced	3 (5.6)	3 (0.8)	6 (1.5)	
Widowed	2 (3.7)	2 (0.6)	4 (1.0)	
Pocket money spent monthly				
<100,000 IQ	18 (33.3)	220 (61.8)	238 (85.0)	< 0.001
100,000-300,000 IQ	19 (35.2)	76 (21.3)	95 (23.2)	
>300,000 IQ	17 (31.5)	60 (16.9)	77 (18.8)	
Place of living				
With family	41 (75.9)	330 (92.7)	371 (90.5)	< 0.001
Own household	9 (16.7)	10 (2.8)	19 (4.6)	
Student Housing	4 (7.4)	12 (3.4)	16 (3.9)	
Others (relative, friends, etc.)	0 (0.0)	4 (1.1)	4 (1.0)	
Residential area				
Rural	42 (77.8)	289 (81.2)	331 (80.7)	0.57
Urban	12 (22.2)	67 (18.8)	79 (19.3)	

Source: compiled by the authors of this study

and make health evaluations. As future healthcare practitioners, nursing students are required to be provided with appropriate knowledge regarding WTS so that they can educate peoples and peers successfully [11]. To overcome misconceptions regarding WTS, nurses are required to be more knowledgeable of them and request assistance that is related to their needs [7].

AIM

This study addresses significant deficiencies in existing research by examining three primary areas: (1) the extent of nursing students' knowledge of the health concerns associated with WTS, (2) individuals' perceptions of utilizing WTS, and (3) the social and cultural influences that may perpetuate its use despite awareness of its detrimental effects.

MATERIALS AND METHODS

A cross-sectional study was performed involving nursing students at the College of Nursing, Thi-Qar University. The College of Nursing is an institution of higher education situated in An-Nasiriyah, Iraq. The institution comprises four departments and has an enrollment of approximately 680 students. A total of 683 students were invited to participate. The final sample consisted of 410 students who completed the survey, yielding a response rate of 60%. Data analysis was performed on the responses from these 410 participants. The sample selection criteria

Table 2. Waterpipe smoking patterns of participants (n=54)

Characteristics [a]	n (%)
Frequency of waterpipe smoking: (During the past 30 days, how many times did you smoke waterpipe/shisha)	
Daily	27 (50.0)
Twice a week	6 (11.1)
Once per week	6 (11.1)
Biweekly	6 (11.1)
Once a month	7 (13.0)
Missing	2 (3.7)
With whom do you usually smoke shisha?	
With friends and/or family members	33 (61.1)
Alone	19 (35.2)
Missing	2 (3.7)
Duration of each waterpipe smoking session: (How long does the waterpipe/shisha smoking session last?)	
Less than 30 min	21 (38.9)
30–60 min	20 (37.0)
>1 hr	11 (20.4)
Missing	2 (3.7)
Place of waterpipe smoking: (Where do you usually smoke waterpipe/shisha?)	
Home	11 (20.4)
Friend's house	7 (13.0)
Relatives' house	1 (1.9)
Public place (cafés/restaurants, someone else's home)	35 (64.8)
When do you usually smoke waterpipe/shisha?	
While drinking tea/coffee	9 (16.7)
After eating	19 (35.2)
When feeling happy	4 (7.4)
When feeling angry or stressed	5 (9.3)
With friends at any time	16 (29.6)
Missing (no smoker)	1 (1.9)
Reason behind waterpipe smoking for the first time	
Curiosity	23 (42.6)
Seeking for pleasure	8 (14.8)
Forming relationships with colleagues	3 (5.6)
Becoming free from community constraints	3 (5.6)
Others	16 (29.6)
Missing (no smoker)	1 (1.9)

Source: compiled by the authors of this study

comprised students of both genders who consented to complete the questionnaire. A validated self-administered questionnaire in English was utilized for the pretest. The questionnaire was developed based on prior studies [8, 13, 14]. The questionnaire consists of four primary sections: demographic data, smoking behavior, attitudes, and knowledge. The survey comprises closed-ended questions. The attitude section comprised nine items measured on a three-point Likert scale (agree, neutral, disagree). The assessment of knowledge was conducted using ten items, with response options of agree, disagree, or don't know. All students at the college have been contacted and asked to participate in the study. The College of Nursing Ethical Committee approved the study. The study occurred between 12 February 2025 and 23 May 2025.

We used SPSS Version 26.0 (IBM Corporation, USA) to do the statistical analysis. Mean ± standard deviation was used to show continuous variables. We demonstrated variables as percentages and numbers. We used

chi-squared tests for categorical variables and Student t-tests for continuous variables to investigate at the relationship between demographics, knowledge, and attitudes about WTS. We used a 95% confidence interval and p-values.

RESULTS

This study included 410 participants, of whom 356 (86.83%) were non-smokers and 54 (13.17%) were current smokers. Remarkably, smokers were older than non-smokers (24.2 years vs. 21.2 years, P < 0.001). Most waterpipe smokers were aged between 20 and 24 years (59.3%). The majority of smokers (92.6%), compared with 28.1% of non-smokers, were males. More than half of the smokers (68.5%), compared with 36.3% of non-smokers, were in the third or fourth year of the study. Only 33.3% of smokers, compared to 61.8% of non-smokers, reported spending less than 100,000 Iraqi dinars per month (Table 1).

Based on a sample of 54 participants, Table 2 indicates the patterns of waterpipe smoking. Most smokers (50.0%) smoked it daily, and approximately 38.9% smoked it each time for less than 30 minutes. In addition, 29.6% of smokers regularly smoked a waterpipe with their friends. More than half (61.1%) smoked it in cafes and restaurants. Furthermore, 35.2 % smoked waterpipes after meals, and 42.6 % had smoked waterpipes for the first time out of curiosity.

When considering the relationship between the various knowledge items and WTS, nine of the ten items were found to be significantly related to smoking waterpipes (p<0.05) (Table3). Smokers were more likely to agree (81.0%) than non-smokers (60.0%) that WTS contains nicotine (p <0.001). Although 76.1% of non-smokers agreed that WTS is addictive, only 72.2% of smokers did the same (p < 0.001). Compared to non-smokers, smokers were more likely to believe WTS is less addictive (68.5% *vs.* 43.5%, p = 0.001). Smokers were more aware of the risks of cardiovascular disease and stroke associated with WTS than non-smokers (92.6% *vs.* 78.9%, p = 0.041). However, they believed incorrectly that water could filter toxins (40.7% *vs*. 20.5%, p = 0.003). Smokers were more likely than non-smokers to correctly identify WTS as containing carbon monoxide (57.4% *vs*. 43.5%, p<0.001) and tar (63.0% vs. 39.0%, p < 0.001). Compared to non-smokers, smokers were considerably more likely to believe that WTS reduced weight (53.7% *vs*. 43.3%, p = 0.003). Most smokers (74.1%) and non-smokers (75.0%) agreed that WTS may cause dental problems (p = 0.037). In terms of total knowledge score, smokers had a slightly higher mean score (0.58 ± 0.14) than non-smokers (0.51 ± 0.22) (p = 0.021).

Participants' attitudes were evaluated on nine items, of which six were found to be significantly related to smoking a waterpipe (Table 4). Only (29.6%) of the waterpipe smokers and (16.0%) of the non-smokers believed that WTS is part of our cultural heritage (p = 0.006). However, non-smokers (15.4%) were less likely than smokers (31.5%) to be convinced that people who smoke waterpipes look "cool" (p = 0.002). In addition, smokers (51.9%) were more likely than non-smokers (21.1%) to believe that people who smoke waterpipes have more friends (p = 0.000). In addition, smokers (48.1%) were more likely than non-smokers (21.1%) to believe that women felt more comfortable smoking waterpipes than cigarettes (p = 0.000). Approximately 44.4% of smokers and 16.0 % of non-smokers perceive that smoking waterpipe is less harmful than smoking cigarettes (p = 0.000). Furthermore, roughly half (53.7%) of smokers reported that smoking waterpipe helps to quit smoking cigarettes (p=0.000).

DISCUSSION

This study is the first examination of the knowledge, attitudes, and behaviors related to waterpipe tobacco smoking (WTS) among nursing students at the University of Thi-Qar in Iraq. The prevalence of waterpipe smoking observed in our sample was 13.1%. This figure is lower than those reported in Palestine (32.9%) by Nazzal et al. [15], in Saudi Arabia (34.0%) by Salih et al.[16] and in Syria (20.2%) by Al-Kubaisy et al. [17]. However, it is higher than the rate documented in Yemen (9.3%) by Nasser & Zhang [3] and is comparable to that found in Qatar (18.1%) by Al-Jayyousi et al.[18].

The current study found a significant relationship between age and WTS, with smokers being considerably older than non-smokers. This finding is consistent with the data gathered by Daradka et al. [10], and may be explained by prolonged exposure to peer dynamics and social influences throughout university life. A significant gender disparity was identified. This aligns with the findings of Khabour et al. [19] in Jordan and corroborates the findings of Hamadeh et al.[20], which indicated that males exhibit a greater tendency to attempt WTS. A study by Othman et al. at Sulaimaniyah University in Iraqi Kurdistan indicates a notable disparity in the prevalence of WTS, recorded at 28%, which was significantly greater among males (49%) than among females (10%) [6]. This suggests that cultural norms render WTS more socially acceptable for males. Furthermore, the prevalence of WTS increased among students in advanced academic years. This pattern is well-documented, as evidenced by research from Al-Rawi et al. and Daradka et al., which consistently shows the highest prevalence rates among senior-year students [10, 21].

Table 3. Associations between socio-demographics and WTS (N = 410)

Knowledge	Yes (N=54) n (%)	No (N=356) n (%)	p-value
Waterpipe contains nicotine			
Agree	44 (81.5)	215 (60.4)	0.000
Disagree	7 (13.0)	13 (3.7)	
Don't Know	3 (5.6)	128 (36.0)	
Waterpipe is addictive			
Agree	39 (72.2)	271 (76.1)	0.000
Disagree	15 (27.8)	28 (7.9)	
Don't Know	0 (0.0)	57 (16.0)	
Waterpipe is less addictive than cigarettes			
Agree	37 (68.5)	155 (43.5)	0.001
Disagree	12 (22.2)	96 (27.0)	
Don't Know	5 (9.3)	105 (29.5)	
Waterpipe smoking can cause lung cancer			
Agree	47 (87.0)	270 (75.8)	0.145
Disagree	3 (5.6)	23 (6.5)	
Don't Know	4 (7.4)	63 (17.7)	
Waterpipe smoking leads to cardiovascular diseases and cerebral stokes			
Agree	50 (92.6)	281 (78.9)	0.041
Disagree	2 (3.7)	16 (4.50	
Don't Know	2 (3.7)	59 (16.6)	
Waterpipe contains carbon monoxide			
Agree	31 (57.4)	155 (43.5)	0.000
Disagree	10 (18.5)	19 (5.3)	
Don't Know	13 (24.1)	182 (51.1)	
Waterpipe smoking leads to dental problems			
Agree	40 (74.1)	267 (75.0)	0.037
Disagree	6 (11.10	13 (3.7)	
Don't Know	8 (14.8)	76 (21.3)	
Waterpipe smoking reduces weight			
Agree	29 (53.7)	154 (43.3)	0.003
Disagree	14 (25.9)	49 (13.8)	
Don't Know	11 (20.4)	153 (43.0)	
Water in waterpipe filters toxins			
Agree	22 (40.7)	73 (20.5)	0.003
Disagree	15 (27.8)	106 (29.8)	
Don't Know	17 (31.5)	177 (49.7)	
Waterpipe contains tar			
Agree	34 (63.0)	141 (39.6)	0.000
Disagree	7 (13.0)	20 (5.6)	
Don't Know	13 (24.1)	195 (54.8)	
Total knowledge (mean+sd)	**0.58 + 0.14**	**0.51 + 0.22**	**0.021**

Source: compiled by the authors of this study

Table 4. Associations between Attitudes and WTS (N = 410)

Waterpipe Smoker			
Attitude	**Yes (N=54) n (%)**	**No (N=356) n (%)**	***p-value***
Having parents who smoke waterpipe make it more likely to smoke waterpipe/shisha			
Agree	39 (72.2)	248 (69.7)	0.330
Neutral	12 (22.2)	65 (18.3)	
Disagree	3 (5.6)	43 (12.1)	
Having friends who smoke waterpipe make it more likely to smoke waterpipe/shisha			
Agree	45 (83.3)	257 (72.2)	0.219
Neutral	5 (9.3)	59 (16.6)	
Disagree	4 (7.4)	40 (11.2)	
Advertisement can encourage waterpipe smoking			
Agree	38 (70.4)	225 (63.2)	0.558
Neutral	8 (14.8)	59 (16.6)	
Disagree	8 (14.8)	72 (20.2)	
Waterpipe smoking is part of our cultural heritage			
Agree	16 (29.6)	57 (16.0)	0.006
Neutral	22 (40.7)	117 (32.9)	
Disagree	16 (29.6)	182 (51.1)	
People smoking waterpipe look cool			
Agree	17 (31.5)	55 (15.4)	0.002
Neutral	21 (38.9)	117 (32.9)	
Disagree	16 (29.6)	184 (51.7)	
People smoking waterpipe have more friends			
Agree	28 (51.9)	75 (21.1)	0.000
Neutral	9 (16.7)	133 (37.4)	
Disagree	17 (31.5)	148 (41.6)	
Girls are more comfortable in smoking waterpipe compared to cigarettes			
Agree	26 (48.1)	72 (20.2)	0.000
Neutral	10 (18.5)	94 (26.4)	
Disagree	18 (33.3)	190 (53.4)	
Smoking waterpipe is less harmful than smoking cigarettes			
Agree	24 (44.4)	72 (20.2%)	0.000
Neutral	12 (22.2)	129 (36.2%)	
Disagree	18 (33.3)	155 (43.5%)	
Smoking waterpipe helps to quit smoking cigarettes			
Agree	29 (53.7)	102 (28.7%)	0.000
Neutral	17 (31.5)	132 (37.1%)	
Disagree	8 (14.8)	122 (34.3%)	

Source: compiled by the authors of this study

Regarding knowledge of WTS, most smokers in our study correctly believed that waterpipes contain nicotine, a finding similar to that reported among dental school students in the United Arab Emirates by Al-Rawi et al. [21]. However, the risk of developing a habit was elevated despite this knowledge. Although a significant proportion of smokers believed that WTS is addictive, they also perceived it as less addictive than cigarettes, a misconception that aligns with the findings of earlier studies by Al-Jayyousi et al. [18], Al-Rawi et al. [21], and others [22, 23]. The majority of smokers were aware of harmful effects such as cardiovascular disease and stroke; only 7.2% reported not knowing about these complications, a level of awareness consistent with

previous research by Al-Jayyousi et al. [18]. A significant number of smokers in this study were also aware that WTS causes dental problems. This finding contrasts with those of Al-Jayyousi et al. [18] and Jackson and Aveyard [22], which showed that smokers were often not aware of the dental health effects of WTS. Our study indicates that smokers hold the belief that WTS contributes to weight reduction, a notion supported by prior research conducted by Raptou and Papastefanou [24] and Stadler et al. [25]. This assumption often relies on the premise that smoking aids in weight loss by increasing metabolism, reducing appetite and caloric intake, and preventing fat storage, as nicotine affects the brain's control of hunger and energy expenditure [24,25]. However, it is essential to acknowledge the paradoxical effect: by impairing respiratory function, cigarette smoking can simultaneously reduce physical activity and potentially result in weight gain, as indicated in the same body of evidence [24, 25]. Smokers in our study were more likely to correctly identify WTS as containing tar and carbon monoxide. This finding supports the earlier research of Abu-Rmeileh et al. [13], who found that students perceived cigarettes as more addictive and containing more nicotine than waterpipes. However, smokers were often incorrect in believing that toxins are effectively filtered by the water, a misconception that was also documented in a previous study by Sutfin et al. [12], which showed participants wrongly believed water filters out all harmful toxins. Collectively, these findings highlight a critical requirement to provide nursing students with targeted health education to correct misconceptions about the health risks of WTS.

Regarding attitudes toward WTS, a small percentage of current smokers in our study viewed WTS as part of their cultural heritage. This finding contrasts with previous research, such as that by Nakkash et al. [26], which indicated that waterpipe smoking is culturally accepted in several Middle Eastern countries. Additionally, in contrast to findings from earlier studies, a minority of current smokers in our cohort perceived waterpipe smoking as 'cool' [6, 18]. The current study found that smokers perceived women to be more comfortable smoking waterpipes than cigarettes. This aligns with previous research, such as that by Al-Jayyousi et al. [18], which has shown that while cigarette smoking is often socially unacceptable for women in Arab nations, waterpipe smoking is quite common and acceptable for women in the Eastern Mediterranean region [18, 27]. Additionally, smokers in our study thought that WTS is less harmful to their health than cigarettes and could even help them quit smoking. This is a common misconception; studies by Akl et al. [28] and Ba et al. [29] have also found that smokers think WTS is less dangerous than cigarettes, and Sutfin et al. [12] found that this belief makes them more likely to smoke waterpipes. These results are in line with the general trend that smokers often don't see themselves as addicts and think they can quit whenever they want. These beliefs may be based on the false idea that water filtration removes toxins or that WTS is less addictive and easier to quit than cigarettes. Our study revealed that smokers perceived waterpipe smoking (WTS) as a popular activity among their peers. This outcome corresponds with the results of Akl et al. [28] and Ba et al. [29]. The study also indicated that a lot of smokers thought that WTS was a fun way to spend time with friends at places like coffee shops and restaurants. This view of WTS as a social activity has been seen in both Arab and Western cultures, especially among college students [28].

Regarding smoking patterns, half of the smokers in our study reported daily waterpipe use, and 38% stated that their typical smoking session lasted less than 30 minutes. These findings differ from those reported by Al-Jayyousi et al. [18], who found that 40% of smokers engaged in WTS only once monthly, and 45% had sessions lasting 30 to 60 minutes. The findings of this study reveal that most smokers preferred cafés for WTS, consistent with the results reported by Obeidat et al. [18]. The desire may create opportunities for social interaction with unfamiliar individuals. The increasing prevalence of waterpipe smoking correlates with greater accessibility of waterpipe products in public venues, including cafés and restaurants, as demonstrated by studies conducted by Al-Jayyousi et al. [18], Al-Rawi et al. [21], and Jradi et al. [30]. Moreover, the majority of participants indicated a preference for smoking waterpipes in social settings with friends and family, a behavior similarly noted among students in the research conducted by Ali and Meer [31]. The research demonstrated that smokers chose WTS after meals, consistent with the results of Al-Jayyousi et al. [16] and Poyrazoglu et al. [32], which suggested that students similarly preferred smoking post-meal.

CONCLUSIONS

The significant prevalence of waterpipe tobacco smoking (WTS) among nursing students at Thi-Qar University, along with the associated misconceptions, constitutes a critical public health issue, undermining both their health and their effectiveness as patient role models. Our findings indicate the need for the prompt incorporation of a focused educational module into the nursing curriculum that specifically dispels WTS misconceptions and examines its social drivers.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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