

# Knowledge, Beliefs and Psychosocial Predictive Factors of Intention and No Intention to Quit Shisha Smoking among University Students in Sharjah

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## ABSTRACT

**Introduction:** Shisha smoking is common in the Arab culture. Shisha smoking is one of the major preventable risks of morbidity and premature mortality rates.

**Aim:** The aim of this study was to assess the knowledge, beliefs and predictive factors of intention and no intention to quit shisha smoking among undergraduate students in Sharjah, United Arab Emirates.

**Materials and Methods:** A total number of 633 university students participated in this cross sectional study. Socio-demographic profiles and shisha smoking status of the students were identified. Fagerstrom Test for Nicotine Dependence assessed their dependency and Knowledge and Beliefs Scale identified their knowledge and beliefs regarding shisha smoking. Transtheoretical Model Questionnaire measured the intention to quit and not having any intention to quit shisha smoking.

Brief Wisconsin Inventory of Smoking Dependence Motives determined the reason for no intention of quitting smoke.

**Results:** Students who have intention to quit shisha smoking have more knowledge that shisha leads to heart diseases and hypertension and these students believe that shisha is more addictive than cigarettes and shisha has lot of nicotine than the students who did not have intention to quit shisha smoking. Dangerous to health, addiction and waste of money were significantly correlated and predicted the level of intention to quit smoking. However, mood enhancement, craving, social environment, cue experience, tolerance were the significant predictors for not intent to quit smoking.

**Conclusion:** Professionals who offer treatment to smokers need to focus on enhancing the knowledge and belief about consequences of shisha smoking, and the predictive factors of not intent to quit shisha smoking.

**Keywords:** Addictive, Fagerstrom test, Nicotine dependence, Predictors

## INTRODUCTION

Tobacco use is the leading cause of preventable diseases, disability, and deaths world wide [1]. Cigarettes, shisha and electronic cigarettes are the common method of smoking [2]. Smoking shisha is becoming a famous method of tobacco smoking in the Middle Eastern countries as well as western countries [3]. Shisha is also called water pipe, originates from the Middle East and certain areas of Asia. In comparison to a cigarette, average water pipe (shisha), is manifold higher in amounts of nicotine (2-3 times), carbon monoxide (about 10 times), tar (25 times), and lead (up to 50 times) [4]. One hour of shisha smoking is the same as inhaling more than 100 cigarettes [5]. Shisha smokers are vulnerable of similar health complications as cigarette smokers [5]. However, shisha smokers are generally unaware about these consequences and continue to smoke shisha [6].

The prevalence of shisha smoking among university students was almost 15% in 2007 [7] that increased to 38.9% in 2019 [8] in United Arab Emirates (UAE), 18% Dammam, Saudi Arabia [9] and 21.5% Pakistan [10]. Recently, Saravanan C et al., reported a high level of addiction and dependency on shisha smoking (16.3%) among university students in the UAE [8]. The cessation of shisha smoking is associated with substantial health benefits and reduced mortality rate [11]. Renouncing smoking at younger ages, especially before age 40, is associated with a larger decline in premature mortality than quitting at a later age [12].

Paradoxically, it is a challenge for the youth to quit smoking. There are many factors attributed to the intention of quitting smoking. Past researcher [2,4,6] identified and suggested fear of addiction, social restriction and health complications were the major reasons for the smokers to quit their shisha habits. Shisha smokers have a common misconception that they could quit when they want and

do not consider themselves as addicts and believes that there is no nicotine in shisha smoking [13,14]. On the contrary, studies have discovered that nearly half of the respondents still resumed the habit of shisha smoking after trying to cessate it [15-17].

Further, smokers believe that water in the shisha pipe filters all the chemicals, rendering it safe [6]. Sixty percent of university students in London [18] and 62.4% students in Turkey [19], 83% in America [20] had no intention to quit shisha smoking, attributed to inadequate knowledge and belief that smoking shisha was not harmful to them and their society. To elaborate, 59% students believed that shisha smoking was less harmful; and 73% believed shisha was less addictive than cigarettes [21]. Therefore, it is imperative to determine the knowledge and belief differences between students who intend and not intend to quit shisha smoking in Sharjah, UAE. This finding will be useful to identify the extent to which knowledge and beliefs influence their intention to quit and not quit smoking.

Moreover, some shisha smokers are reluctant to quit smoking as quitting smoking leads to weight gain, produces cough and face difficulties to manage stress [22-24]. Some others are not intent to quit shisha smoking as they believe that shisha enhances their social and interpersonal relationships, reduces their tension and weight, is less harmful and relatively cheaper than chewing tobacco or smoking cigarettes [25-28]. Researcher found that mental and cultural benefits were the major factors compared to physical, social and recreational factors for smoking [29]. On the other hand, some shisha smokers wish to quit smoking as they think shisha is expensive, dangerous to health, increase body weight, gives unpleasant smell, spoils their social reputation and is also associated with complications of smoking such as dry cough, black stain in the teeth etc., [27,30,31]. However, there is a dearth of evidence

regarding predictive factors for intentional and unintentional to quit shisha smoking among university students in the UAE.

University of Sharjah (UOS) is one of the largest universities in the northern emirates of UAE. Though Sharjah emirate and University of Sharjah have policy prohibiting shisha smoking in public places and cafeterias, people smoke when they travel to other emirates, and in private settings. There is a compelling need to determine the knowledge and beliefs about the intention to quit shisha smoking in university students, examine the reasons for not quitting and analysing the predictors leading lack of intention to quit shisha smoking among them. Such a study would be beneficial to understand the smoking patterns in other universities having students with similar socio-cultural backgrounds in order to take proactive steps in controlling this rising menace. To our knowledge, this is the first study screening various psychosocial factors of intention and no intention to quit smoking shisha among university student population in UAE. Hence the aim of the current study is:

- To identify the knowledge and belief differences between students who have intention and those not having intention to quit shisha smoking
- To analyse the co-relationship between the levels of intention to not quit smoking and causes (affect-mood enhancement, cognitive enhancement, craving, social/environment, cue response, taste, tolerance and weight control) for not quitting shisha smoking among university students
- To relate the extent to which causes (affect-mood enhancement, cognitive enhancement, craving, social/environment, cue response, taste, tolerance and weight control) predict the levels of intention to not quit smoking among university students
- To analyse the co-relationship between the negative physical effects, reputation, waste of time, waste of money, addiction and levels of intention to quit smoking among students who are intend to quit shisha smoking
- Identify the extent to which negative physical effects, reputation, waste of time, waste of money, addiction predict the levels of intention to quit shisha smoking among students who are intend to quit shisha.

## MATERIALS AND METHODS

The first part of this research project that includes the screening of university students according to their smoking status and precipitating factors for smoking shisha has been published by Saravanan C et al., [8]. The data presented here focuses on predictors of intention and non-intention to quit shisha smoking and this data has not been published before.

### Participants

In this cross sectional study, a total of 633 students pursuing any undergraduate program in UOS during the academic year September 2017 to August 2018 participated in an online survey that was administered through university website to collect the data. This study was conducted from October 2017 to May 2018 in Sharjah. The present study includes data of the students who opted to answer the questionnaires based on their shisha smoking habits. The mean age of these participants was 20.9 years. Out of 633, 349 (55.13%) students were current shisha smokers. Out of 349 shisha smokers, 103 (29.5%) students were addictive and dependent on shisha smoking based on Fagerstrom test for nicotine dependence (FTND) test score. These 103 students were categorised into two groups: intend to quit, and not intend to quit based on their response in the Transtheoretical model questionnaire (TTM) scale.

**Socio demographic information sheet:** It was used to measure student's age, gender undergraduate program registered and smoking status.

**Shisha smoking status:** A shisha smoking status is measured based on criteria. "Current shisha smokers" is one who has smoked shisha in last 30 days prior to this survey. "Ever shisha smoker" is the one had not smoked shisha in last 30 days prior to survey but had tried in the past (even a puff). This criterion is based on the previous studies [32,33]. The criteria of shisha smoking facilitate to distinguish between ever and current shisha smokers; however, no criteria is available to identify former shisha smokers. The present study includes data of the students who opted to answer the questionnaires based on their shisha smoking habits.

**Fagerstrom Test for Nicotine Dependence (FTND) [34]:** This scale consists of 6 items. FTND score ranges from 1 to 2 indicate low dependence, 3 to 4 indicate low to moderate dependence and 5 and above indicate high dependence. Fagerstrom K and Furberg H, identified that smokers who secure 5 and above in FTND are considered as highly dependent on shisha dependency and they need treatment immediately [34]. In the current study, shisha dependency was considered in those participants who scored 5 and above in FTND. The test-retest reliability of FTND is 0.67 and has been used in previous researches [35,36].

**Knowledge and beliefs scale:** The Global Adult Tobacco Survey (GATS) [37] was used to measure the knowledge and beliefs about shisha smoking. The participants answer to this scale "yes" specifies adequate knowledge and belief, and "no" and "don't know" specify that they have lack of knowledge and beliefs about shish smoking. Previous researchers [38,39] had used this scale to measure the knowledge and beliefs about smoking. Based on the previous study, the Cronbach alpha value of 0.85 [40].

**Transtheoretical Model Questionnaire (TTM) [41]:** This scale was used to measure participants' intention to quit and not having any intention to quit shisha smoking. Intentions to quit smoking items were adapted from the Transtheoretical model of change questionnaire. The items included: no intention to quit shisha and intention to quit shisha in next 30 days. Participants were asked to mention their intention to quit or not intention to quit their shisha smoking habit in the 'yes' or 'no' type questions. Students who answered 'yes' indicated their intention to quit and those who answered 'no' indicated no intention to quit. Further, participants were asked to mention their level of intention to quit on a five point Likert scale where 1 indicated "intention to quit" and 5 indicated "extremely high intention to quit". Similarly, students who did not have intention to quit wherein the measure on a five point Likert scale 1 indicated "no intention to quit" and 5 indicated "extremely no intention to quit". The Cronbach alpha coefficient reliability ranged between 0.60 and 0.84 [42].

**The Brief Wisconsin Inventory of Smoking Dependence Motives (BWISDM) [43]:** This scale is used to measure the reason for no intend to quit shisha smoking. The subscales are affective enhancement, cognitive enhancement, craving (addiction), social/environment goals, cue exposure, tolerance, weight reduction and taste. The good internal consistency with Cronbach's alpha value is 0.87 [43].

**The Smoking Effects Questionnaire (SEQ) [44]:** This scale was used to measure negative effect of shisha smoking. It consists of 33 items load on seven sub scales with two higher-order factors (positive and negative). This study used only negative expectancy sub-scales (negative physical effects, negative psychosocial effects and future health concerns) and did not use the positive sub scale. Negative psychosocial effects and future health concerns subscales focus on health issues. Therefore, these two subscales were merged for scoring purpose [45-47].

### Procedure

After obtaining the research and ethical approval (REC No:17-01-09-03-17-P) from University of Sharjah, the researchers invited all undergraduate students through official UOS email IDs to participate

in this study. Some participants may smoke others substances in addition to shisha. Therefore participants had been instructed to answer the questionnaires based on their frequency of smoking habits such as shisha, dokha and cigarettes. This study included only the participants who had responded that they were shisha smokers and their answer to the questionnaire is based on their shisha smoking habits. Remaining students who had responded that they were cigarette and dokha smokers were excluded from this study. Current shisha smokers were instructed to mention either they have any intention to quit or not having any intention to quit shisha smoking. Those participants who had described themselves as not having intention to quit were asked to rate their level (1 to 5) of intention to not quit shisha smoking. Similar method was used to measure the participants who were intend to quit shisha smoking. Students who had mentioned themselves not having intention to quit, and intention to quit in few months were asked to fill the knowledge and belief scale. In addition, students who were not intend to quit shisha smoking were asked to complete the BWISDM scale to measure the reasons for not intend to quit smoking. Similarly, students who were intend to quit shisha were asked to fill the SEQ scale to measure the reasons for intend to quit smoking. Participants were instructed to clarify their doubts through the email address of the authors stated in the information sheet.

## STATISTICAL ANALYSIS

SPSS version 24 was used to analyse the data [48]. Cross tabulation was used to identify knowledge and belief differences between students who had intention and those who did not have intention to quit shisha smoking. Pearson correlation was used to measure the relationship between predictive factors (affect-mood enhancement,

cognitive enhancement, craving, social/environment, cue response, taste, tolerance and weight control) and the level of intention to not quit shisha smoking. In addition, stepwise multiple regression analysis was used to identify the best predictor factors of intention to not quit shisha smoking among shisha dependency students.

## RESULTS

**Prevalence of shisha smokers:** Out of 349 shisha smokers, 103 (29.5%) students were addictive and dependent on shisha smoking based on FTND test score. Out of 103 students, 59 (57.3%) had the intention to quit shisha smoking, and 44 (42.7%) had no intention to quit shisha smoking.

**Differences in knowledge and beliefs about shisha smoking between students who had intention to quit and those who did not have intention to quit shisha smoking:** [Table/Fig-1] highlights that participants who have intention to quit shisha smoking have more knowledge about the consequences of shisha smoking such as smoking leads to heart diseases and hypertension, and believe that shisha smoking is addictive than cigarettes and there is lot of nicotine in shisha smoking than students who have no intention to quit shisha smoking.

**Relationship between the levels of no intention to quit shisha smoking and psychosocial variables:** [Table/Fig-2] shows there was a significant positive relationship between affective (mood) enhancement, craving, social environment, cue experience, tolerance and levels of not having intention to quit shisha smoking measured by using five point Likert scale among current shisha dependency students. This study could not find significant correlation between cognitive enhancement, taste, weight control and no intention to quit shisha smoking.

Items	Responses	No intention to quit (n=44)	Intention to quit (n=59)	Total (n=103)	p-value
		N (%)	N (%)	N (%)	
Does smoking cause lung cancer	Yes	13 (12.6)	32 (31.1)	45 (43.7)	0.173
	No	24 (23.3)	21 (20.4)	45 (43.7)	
	Don't know	7 (6.8)	6 (5.8)	13 (12.6)	
Does smoking cause stroke	Yes	9 (8.7)	27 (26.2)	36 (35.0)	0.119
	No	20 (19.4)	18 (17.5)	38 (36.9)	
	Don't know	15 (14.6)	14 (13.6)	29 (28.2)	
Does smoking cause heart disease	Yes	27 (26.2)	47 (45.6)	74 (71.8)	0.031
	No	13 (12.6)	8 (7.8)	21 (20.4)	
	Don't know	4 (3.9)	4 (3.9)	8 (7.8)	
Does smoking cause gum infection	Yes	6 (5.8)	17 (16.5)	23 (22.3)	0.204
	No	21 (20.4)	20 (19.4)	41 (39.8)	
	Don't know	17 (16.5)	22 (21.4)	39 (37.9)	
Does smoking cause hypertension	Yes	4 (3.9)	15 (14.6)	19 (18.4)	0.049
	No	15 (14.6)	17 (16.5)	32 (31.1)	
	Don't know	25 (24.3)	27 (26.2)	52 (50.5)	
Does smoking cause sexual dysfunction	Yes	16 (15.5)	36 (35.0)	52 (50.5)	0.220
	No	17 (16.5)	19 (18.4)	36 (35.0)	
	Don't know	11 (10.7)	4 (3.9)	15 (14.6)	
Is shisha more addictive than cigarettes	Yes	8 (7.8)	29 (28.2)	37 (35.9)	<0.001
	No	34 (33.0)	28 (27.2)	62 (60.2)	
	Don't know	2 (1.9)	2 (1.9)	4 (3.9)	
Does the water in shisha filters the toxins	Yes	7 (6.8)	32 (31.1)	39 (37.9)	0.352
	No	20 (19.4)	18 (17.5)	38 (36.9)	
	Don't know	17 (16.5)	9 (8.7)	26 (25.2)	
Is there a lot of nicotine in shisha tobacco smoking	Yes	15 (14.6)	35 (34.0)	50 (48.5)	0.034
	No	27 (26.2)	18 (17.5)	45 (43.7)	
	Don't know	2 (1.9)	6 (5.8)	8 (7.8)	

[Table/Fig-1]: Differences in knowledge and beliefs between students who have intention and not having intention to quit shisha smoking.

		Affective enhancement	Cognitive enhancement	Craving	Social environment	Cue experience	Taste	Tolerance	Weight control
Not having intention to quit shisha	R	0.325	0.260	0.332	0.384	0.310	0.182	0.418	0.164
	p	0.031*	0.089	0.027*	0.010**	0.041*	0.237	.005**	0.287

**[Table/Fig-2]:** Correlation between psychosocial factors and no intention to quit shisha smoking.

\*p<0.05 level; \*\*indicate p<0.001 level

**Predictors for not having intention to quit shisha smoking:** [Table/Fig-3] presents the factors that predict no intention to quit smoking among students who are addictive for shisha dependency. A stepwise multiple regression model was run with the independent (predictor) variables including affective enhancement, craving, social environment, cue experience and tolerance that significantly correlated with dependent (criterion) variable of not having intention to quit shisha smoking in students, but the result of the stepwise multiple regression excluded all variables except tolerance. So, the simple regression analysis was done, which indicates 10.6% ( $R^2=0.106$ ,  $F(1,42)=4.96$ ;  $p=0.031$ ) of affective enhancement; 11.1% ( $R^2=0.111$ ,  $F(1,42)=5.22$ ;  $p=0.027$ ) of craving; 14.8% ( $R^2=0.148$ ,  $F(1,42)=7.28$ ;  $p=0.010$ ) of social environment; 9.6% ( $R^2=0.096$ ,  $F(1,42)=4.46$ ;  $p=0.041$ ) of cue experience and 17.5% ( $R^2=0.175$ ,  $F(1,42)=8.88$ ;  $p=0.005$ ) of tolerance is significantly predict students levels of not intend to quit shisha smoking behaviour.

Variable	B	SE	$\beta$
Affective enhancement	0.173	0.078	0.325*
Craving	0.203	0.089	0.332*
Social environment	0.231	0.085	0.384*
Cue	0.173	0.082	0.310*
Tolerance	0.207	0.069	0.418*

**[Table/Fig-3]:** Predictive factors of not having intention to quit shisha smoking.

\*p<0.05

**Relationship between psychosocial factors and intention to quit shisha smoking:** [Table/Fig-4] shows that factors including dangerous to health; addiction and waste of money were significantly correlated with level of intention to quit smoking among university students. Reputation and waste of time was not statistically correlated with the level of intention to quit smoking.

		Dangerous to health	Affects my reputation	Waste of time	Waste of money	Become more addictive
Intention to quit shisha	R	0.807	0.12	0.173	0.320	0.798
	p	<0.001**	0.928	0.190*	0.013*	<0.001**

**[Table/Fig-4]:** Correlation between psychosocial factors and intention to quit shisha smoking.

**Predictive factors for intention to quit shisha smoking:** A stepwise multiple regression model was run with the independent (predictor) variables including dangerous to health, addiction, and waste of money that correlated significantly with level of intention to quit shisha smoking as the dependent (criterion) variable in students. [Table/Fig-5] shows that 65.2% ( $R^2=0.652$ ,  $F(1,57)=106.6$ ;  $p<0.001$ ) of dangerous to health and 83.3% ( $R^2=0.833$ ,  $F(2,56)=139.47$ ;  $p<0.001$ ) of addiction significantly predicted participants intention to quit shisha smoking. Waste of money was excluded from the model.

Variable	B	SE	$\beta$
Levels of intention to quit shisha smoking	0.398	0.277	
Dangerous to health	0.344	0.042	0.529*
Dangerous to health and addiction	0.564	0.072	0.508*

**[Table/Fig-5]:** Predictive factors for intention to quit shisha smoking.

\*p<0.05

## DISCUSSION

This study was conducted to identify the knowledge and beliefs about shisha smoking between students who intend and not

intend to quit shisha smoking, at what extent affective (mood) enhancement, cognitive enhancement, taste of shisha, craving, social environment, cue experience, tolerance predict an intention to quit shisha smoking and also at what extent dangerous to health, addiction, waste of time and waste of money predict the reasons for intend to quit shisha smoking among students in one of the largest universities in the UAE.

In this study, 44 (42.7%) expressed no intention to quit and 59 (57.3%) reported the intention to quit shisha smoking. Comparatively, the intention to not quit shisha smoking was higher among university students in USA 83% [20], Pakistan 50% [49] and Qatar 45.9% [6]. Most of the students did not have the intention to quit shisha smoking due to its cultural acceptance and misbelief that shisha pipe filters all the nicotine content [16]. On the other hand, in this study most of the shisha dependents 59 (57.3%) were intend to quit their shisha habits. Similar findings were reported from Qatar 54% [6] and Saudi Arabia 57.4% [50]. The students intention to quit shisha smoking is most likely due to awareness about smoking consequences or experience of its complications such as throat irritation, headache etc., [6,27]. In addition, Government of UAE is promoting more awareness about smoking and its complications and University of Sharjah strictly prohibiting any form of smoking inside the campus and shisha smoking throughout the Emirate of Sharjah.

In this study, overall student knowledge and belief about the detrimental effects of smoking such as cardiac problem, hypertension, shisha contains more nicotine and is more addictive than cigarettes was higher among students who had the intention to quit compared to the students who did not have intention to quit shisha smoking. This finding is consistent with previous studies that students intend to quit shisha as they experience various health problems such as dry throat, headache and nausea [6,27]. Students were willing to quit when they believe water pipe smoking was harmful [20]. This study could not find significant difference between, students who had intention to quit and non-intention to quit shisha on the detrimental effect of smoking leads to cancer, sexual dysfunction, gum infection, stroke and shisha pipe filters the toxic substance. This indicates both group students did not have adequate knowledge and belief about the detrimental effect of shisha smoking. This could be one of the reasons for the students to continue their smoking habit. Though the university warns the consequences of smoking, students tend to smoke shisha as they have insufficient knowledge about shisha and strongly believe that shisha is not harmful to them. So there is a need to educate and promote awareness by conducting workshop and incorporating health awareness programs in the curriculum.

In this study, students were not intending to quit shisha smoking as they believed that shisha smoking enhanced their positive mood and social relationship. In addition, their tolerance, craving and friends' smoking behaviour were significant predictors for not intend to quit shisha smoking. These findings are consistent with previous studies that smoking environment, both at home and at work, reduced their stress, enhanced their pleasure and strongly associated with not intend to quit shisha smoking among students [22,51,52]. On the contrary, smoking is not an effective way to tackle stress, nor enhances pleasure; in fact, it leads to detrimental effect on health. Smoking habit in students is aggravated by their peer smoking behaviour [51]. Consequently, more interaction with friends enhances their smoking behaviour and increases their motivation to continue their smoking behaviour despite of health

complications. Though the government of UAE warns that shisha smoking is hazardous, but smokers are stimulated by media advertisement of smoking and celebrities smoking behaviour in the movies. However, this study could not find cognitive enhancement, weight management or taste of shisha as significant predictors for not intend to quit shisha smoking. Smokers believed that smoking helps them to reduce their body weight [53]. Pragmatically, shisha smoking impairs the attention and concentration, and increase the weight gain [54,55]. There is an immediate need to educate these smokers as they believe smoking is beneficial for them.

Dangerous to health and fear of addiction factors were the significant predictors to quit shisha smoking among this study population. Previous studies also found that students intend to quit smoking due to health concern and fear of shisha addiction [20,52]. Warnings on the tobacco boxes and other negative effects of shisha smoking advertisements could also be one of the reasons to quit shisha smoking [56]. This study could not find that the cost of shisha is not the major reason to quit smoking, but [52] found in their study that the high cost cigarettes is one of the reasons to quit smoking. Shisha is not very expensive in UAE and most of the people keep the shisha pipe at their home would be one the reasons for not quitting shisha smoking [57]. Shisha smokers do not feel smoking affects their reputation as it is accepted culturally [57]. Unpleasant smell of smoke and that smoking waste their time were not major factors associated with quitting smoking among this study participant. However, previous studies established that these factors also contributed to quitting smoking [48,52]. Shisha is available in different flavors and smoke from the shisha gives good fragrance. Thus motivate the shisha smokers to smoke more when they interact with their friends and others, continuing their shisha smoking habit [58].

Educational institutions need to conduct the anti-smoking workshop for all students during their orientation week. Students should be guided where to seek intervention for their shisha smoking behaviour as some students wish to quit, but they are not sure to whom they can approach. University needs to provide e-lecture and videos about the complication of substance abuse which include shisha, cigarettes etc., Students who renounced smoking habit can be invited to share their experience in quitting smoking with current smokers. This will further motivate the shisha smokers to quit shisha smoking. Intervention and educational workshop has to focus on the precipitating factors for their smoking and how to tackle the precipitating factors.

## LIMITATION

This study data had been collected by using convenience sampling method and this may led to sampling bias. This study had used FTND to measure the shisha dependency, but this may not warrant that these students are clinical addictive for shisha smoking. This study had excluded students who were not addictive for shisha smoking and included students who were addictive for shisha smoking based on FTND. This limits the generality of this study. This study did not measure the correlation between duration of shisha smoking and intention to quit. Students who smoked shisha for a longer duration are postulated to be reluctant to quit shisha smoking due to addiction. Due to the cross sectional nature of this study, there was no follow-up to reassess the status of shisha smoking among those students who reported that they had intention to quit shisha smoking.

## RECOMMENDATIONS

It will be relevant to measure the duration of shisha smoking in relation to the intention to quit shisha smoking. Second, future study can focus on western university in UAE as the prevalence and predictors of intention to quit and not quit may vary. This study had used FTND to measure the shisha dependency, but this may not warrant that these students are clinical addictive for shisha smoking. So this study recommends to assess the dependency by

using questionnaire and also clinically interview the students, will reconfirm the shisha addiction and substance abuse disorder.

## CONCLUSION

Overall students who had intention to quit shisha have adequate knowledge that shisha leads to heart diseases and hypertension, and shisha is more addictive and harmful than cigarettes. We found that health impact of shisha and fear of addiction to shisha smoking were the major predictors of intention to quit shisha smoking. On the contrary, students who were reluctant to quit shisha smoking believed that shisha enhances their mood and interpersonal relationship with their peers, and reduces their tolerance and craving. Student counseling units at the universities need to conduct anti-smoking campaign to enhance their knowledge and modify beliefs about the biopsychosocial consequences of shisha smoking and reduce the predictive factors of not intent to quit shisha smoking among students.

## Human Subject Approval Statement

We obtained informed consent from all participants before they fill the questionnaire in the study. The research protocol was approved by the Ethics and Research Committee (REC-17-01-29-02) at University of Sharjah.

## Data Availability

The data that support the findings of this study are available on request from the corresponding author.

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