

Predictors of Past Quit Attempts and Length of Abstinence among Waterpipe Smokers in Lebanon

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ABSTRACT

Introduction: The popularity of waterpipe smoking is dramatically increasing in Lebanon, reaching 36.9%, the highest among countries in the region, with a false belief that waterpipe is less dangerous and toxic compared to cigarettes.

Aim: To assess factors associated with the quit attempts and their past length of abstinence in a Lebanese sample of waterpipe smokers.

Materials and Methods: A cross-sectional study was conducted between March 2014 and March 2015 involving 127 patients. A questionnaire was completed by each participant; Quit attempts, real quit attempt durations and the intention to seriously quit waterpipe smoking in 2 months were assessed. Two forward logistic regressions were performed,

taking into account the variables in the bivariate analysis that showed a p-value <0.2.

Results: Past attempt to quit waterpipe smoking was significantly higher among smokers who had cough and expectoration for more than 3 weeks (OR=8.2), at higher stages of readiness to quit (OR=2.78) and being highly motivated (OR=2.27). A longer duration of abstinence to smoke waterpipe was higher among waterpipe smokers less than 45 years (OR=6.85), who considered it very important to report health warning on tumbac packages (OR=3.09) and with a low waterpipe dependence (OR=2.13).

Conclusion: Health care professionals should play an important role in explaining the side effects of waterpipe smoking in order to decrease dependence.

Keywords: Intention to quit, Motivation, Narguileh, Quit attempt, Readiness to quit, Shisha

INTRODUCTION

The popularity of waterpipe smoking is dramatically increasing in Lebanon, reaching 36.9%, the highest among countries in the region. Many waterpipe smokers falsely consider that waterpipe smoking is a less dangerous and toxic alternative to cigarettes [1]. This evidence validates the extensive potential damage of waterpipe smoking, as well as its addictive nature.

Previous findings estimating the economic burden of major cancer due to smoking in Iran showed that smoking was responsible for 16.5% of cancer deaths, 17.2% of years of potential life lost and 21% of the cost of productivity [2,3]. A waterpipe session consistently implicates almost 200 puffs, with an average puff volume exceeding 500 mL among actual waterpipe tobacco smokers in real life situations [4], much more than the quantity inhaled by cigarette smokers (500-600 mL of smoke) [5,6].

Smoking cessation among adult smokers is critically imperative to improving public health initiatives since about 50% of smokers die from tobacco-related diseases [4-6]. It is a difficult and complex process, and smokers use many methods and approaches to achieve cessation. Many theoretical models have identified a number of variables that influence smoking cessation such as intentions, self-efficacy, and vulnerability [7,8]. Pictorial graphic warnings have more influence on the behaviour of waterpipe smokers (reducing/quitting smoking) than textual warning, especially among females and highly motivated smokers. A previous attempt to quit has been reported as a significant predictor of an intention to quit tobacco smoking. Encouraging waterpipe smokers to try stopping, even once, could improve their chance of actually quitting in the future. Successful quitting is often defined by the length of abstinence, with typical criterion lengths ranging from one to six months. There is not much information available on the percentage of current smokers that attained these thresholds and relapsed afterward.

To the best of the authors' knowledge, no studies were done previously in Lebanon concerning quit attempts among waterpipe smokers. The purpose of this study was to evaluate the main factors associated with the number of past quit attempts and their length of abstinence among Lebanese Waterpipe Smokers.

MATERIALS AND METHODS

This was a cross-sectional study conducted in five outpatient clinics located in five hospitals in Lebanon, between March 2014 and March 2015, where there are physicians (pulmonologists in particular) who are interested in smoking cessation and who apply smoking cessation methods. This study included waterpipe adult smokers age ≥ 18 years. The Lebanese University Investigational Review Board waived approval of the study since it is an observational non-invasive study that respects participants' autonomy and anonymity.

Study Participants

A standardised questionnaire was completed in the waiting rooms of respiratory outpatient clinics. The study first targeted the first eligible person entering the clinic and consenting to take part in the study. Healthy individuals were included, provided they were current waterpipe smokers "defined as currently smoking ≥ 1 waterpipe per week". The interview was carried out by trained pharmacists and nurses. A verbal consent was given by participants in order to be included in the study.

Study Tool and Variables

The pretested questionnaire from the standardised questionnaire of the ISAAC [9] was given to all participants. It was adapted to local Arabic language; validation details of the translated questionnaire are presented in previous studies [10]. Sociodemographic characteristics, including age categorised into ≤ 45 years and >45 years, gender, place of residence, employment status, educational level (low education (illiterate, primary, complementary, secondary

levels) versus high education (university)) and the marital status (married versus single status (single, divorced or widowed)) were assessed.

Concerning the smoking behaviour, the participants were asked about the waterpipe smoking status, the number of waterpipes smoked per week (1-2, 3-6 and >7), the number of family members smoking waterpipe (≤ 1 versus >1), if the patient smoked indoor, the number of smokers at work (≤ 1 or >1) and submission to tobacco smoking at work. The age of waterpipe smoking onset was categorised into 10-14, 15-17 and ≥ 18 years.

To assess the presence of chronic respiratory symptoms, the patient was asked about the physician's diagnosis of respiratory disease (chronic wheezing, chronic cough, chronic phlegm and chronic allergy).

The waterpipe smoking dependence status was measured via the LWDS-11 scale, a validated scale for waterpipe smoking users in Lebanon. Scores were divided into low dependence (≤ 10) and high dependence (>10). The motivation to quit smoking was measured using the Mondor scale; scores were categorised into ≤ 12 reflecting a low motivation to quit and >12 reflecting a high motivation to quit

Question	Possible answers
Packaging perception	
How much do you think the labels of the tumbac packaging were actually appreciated and their perceived effectiveness for smoking cessation or reduction?	Textual warning Pictorial warning Both
If your favourite tumbac brand decides to change its look using these pictorial warnings on tobacco packaging, would you think of buying another tumbac brand?	No Yes
If you could choose the type of warning labels on tumbac packs, which one do you feel as more effective in helping to stop smoking?	Graphic images Texts Both
Influence of warnings on the patient's decision or intention to quit	
Have you ever stopped smoking due to the warnings?	No Yes
Are you or have you been influenced by the health warnings on tumbac packages (in relation to the weekly number of waterpipe smoked)?	No Yes
Have you changed your smoking habits due to the warnings (e.g., not smoking after coffee)?	No Yes
Do you consider it important to report the health warnings about tobacco consumption on tumbac packs?	A lot Enough Poor No
Have the health warnings increased the curiosity or the desire to be better informed or to be helped to give up smoking?	A lot Enough Poor No
If shocking images were used on tumbac boxes, would they have greater effect than simple warning text currently used?	No Yes
If your favourite tumbac brand/company decide to change the look of its tumbac boxes with shocking images on smoking health damage, would you think of changing it?	No Yes
If you could choose the types of warning labels on tumbac packs, which one do you feel as more effective in helping to stop smoking?	Textual warning only Pictorial warning only Both textual and pictorial warnings
Quit attempts	
How many times during the last year have you stopped smoking for 1 week or longer?	zero quit attempts ≥ 1 quit attempt
How long have you been stayed without smoking any waterpipe?	<1 month ≥ 1 month
Intention to seriously quit waterpipe smoking in 2 months	No Yes

[Table/Fig-1]: Questions asked about packaging perception, the influence of warnings on the patient's decision or intention to quit and the quit attempts.

[11,12]. The questions used in the study are summarised in [Table/Fig-1].

STATISTICAL ANALYSIS

Data analysis was performed using IBM-SPSS version 19 software for Windows Release (IBM Corp. released in 2010 IBM SPSS Statistics for Windows, Version 19.0; IBM Corporation, Armonk, NY, USA). Categorical data were shown as absolute frequencies and percentages. Continuous data were presented as means \pm Standard Deviation (SD). Two-sided statistical tests were used; Chi-square test or the Fisher-exact test for dichotomous or multinomial qualitative variables, and Student's t-test for quantitative variables of normal distribution and homogeneous variances. Regarding multivariate analysis, 2 forward logistic regressions were performed, taking into account the variables in the bivariate analysis that showed a p-value <0.2 . The first regression took the quit attempts as the dependent variable (yes/no), whereas the second one considered the quit attempt duration (less than 1 month/more than 1 month) as the dependent variable. The statistical significance was set at a p-value <0.05 .

RESULTS

Data was collected from 127 waterpipe smokers with a response rate of 92%. [Table/Fig-2] summarises the sociodemographic characteristics of waterpipe smokers.

Variable	Waterpipe smoker (n=127) N (%)
Gender	
Male	57 (44.9)
Female	70 (55.1)
Age group	
≤ 45 years	110 (86.6)
>45 years	17 (13.4)
Married status	
Married	58 (45.7)
Single	69 (54.3)
Educational level	
Low	43 (33.9)
High	84 (66.1)
Work status	
Employed	84 (66.1)
Unemployed	33 (26)
Never employed	10 (7.9)
District	
Beirut	23 (18.1)
Mount Lebanon	41 (32.3)
North Lebanon	63 (49.6)
Number of smokers in the family	
≤ 1 person	53 (41.7)
>1 person	74 (58.3)
Smoking inside the house	
No	36 (28.3)
Yes	91 (71.7)
Smoking at work	
≤ 1 person	89 (70.1)
>1 person	38 (29.9)
Submission to smoke at work	
No	97 (76.4)
Yes	30 (23.6)

[Table/Fig-2]: Socio-demographic characteristics of Waterpipe smokers in Lebanon.

Bivariable Analysis

[Table/Fig-3] presents the results of the analysis that examined predictors of past quit attempts. A 13% of the persons who had more cough and expectoration for more than 3 weeks had significant smoking quit attempts (p=0.03), while highly motivated smokers according to the Mondor scale score had significant quit attempts (p=0.007). Furthermore, smokers with high readiness to quit had significant quit attempts (p=0.004), whereas smokers with past quit attempts confessed hypothetically changing the type of tumbac they smoke if the company decides to use shocking

Factor	No (n=67)	Yes (n=60)	p-value
District			
Beirut	9 (13.4)	14 (23.3)	0.18
Mount Lebanon	20 (29.9)	21 (35)	
North Lebanon	38 (56.7)	25 (41.7)	
Smoking inside the house			
No	23 (34.3)	13 (21.7)	0.11
Yes	44 (65.7)	47 (78.3)	
Work status			
Employed	43 (64.2)	41 (68.3)	0.15
Unemployed	21 (31.3)	12 (20)	
Never employed	3 (4.5)	7 (11.7)	
Cough and expectoration for more than 3 weeks			
No	65 (97)	52 (86.7)	0.03
Yes	2 (3)	8 (13.3)	
LWDS-11			
Low dependence	28 (41.8)	29 (48.3)	0.45
High dependence	39 (58.2)	31 (51.7)	
Mondor scale			
Low motivation	47 (70.1)	28 (46.7)	0.007
High motivation	20 (29.9)	32 (53.3)	
Readiness to quit			
Low	54 (80.6)	33 (56.9)	0.004
High	13 (19.4)	25 (43.1)	
If your favourite tumbac brand/company decide to change the look of its tumbac boxes with shocking images on smoking health damage, would you think of changing it?			
No	42 (62.7)	24 (41.4)	0.02
Yes	25 (37.3)	34 (58.6)	
Do you consider report of health warnings on tumbac packages to be very important?			
No	24 (35.8)	14 (24.1)	0.01
Yes very important	23 (34.3)	33 (56.9)	
Yes important enough	8 (11.9)	9 (15.5)	
Of low importance	12 (17.9)	2 (3.4)	
Intention to quit in 2 months			
No	58 (86.6)	48 (80)	0.22
Yes	9 (13.4)	12 (20)	

[Table/Fig-3]: Bivariable analysis for quit attempts taken as dependent variable.

images on the boxes (p=0.02). Smokers with past quit attempts considered reporting health warnings on tumbac packages to be significantly very important as compared to smokers with no quit attempt (p=0.01).

[Table/Fig-4] presents the results of the bivariate analysis that evaluated the predictors of the length of the quit attempt. People more than 45 years of age had a significant quit attempt duration of less than 1 month (p=0.02), whereas smokers with high readiness to quit had a significant duration of quitting of ≥1 month (41.3%, p=0.04). Smokers with a quit attempt duration of

1 month or more confessed that shocking images would have a greater effect than a simple textual warning on tumbac boxes (p=0.02) and that they would hypothetically switch the tumbac brands if the manufacturing company would use shocking images on the box (p=0.02). Around seventeen percent of the persons who had a quit attempt duration of ≥1 month acknowledged that they stopped smoking because of the warnings on the tumbac boxes (p=0.05). A significantly greater percentage of smokers

Variable	<1 month (n=80)	≥1 month (n=47)	p-value
Smoking inside the house			
No	26 (32.5)	10 (21.3)	0.17
Yes	54 (67.5)	37 (78.7)	
Age group			
≤45 years	65 (81.3)	45 (95.7)	0.02
>45 years	15 (18.8)	2 (4.3)	
LWDS-11			
Low dependence	31 (38.8)	26 (55.3)	0.07
High dependence	49 (61.3)	21 (44.7)	
Readiness to quit			
Low	60 (75.9)	27 (58.7)	0.04
High	19 (24.1)	19 (41.3)	
If shocking images were used on tumbac boxes, would they have greater effect than simple warning text currently used?			
No	32 (40.5)	9 (19.6)	0.02
Yes	47 (59.5)	37 (80.4)	
If your favourite tumbac brand/company decide to change the look of its tumbac boxes with shocking images on smoking health damage, would you think of changing it?			
No	48 (60.8)	18 (39.1)	0.02
Yes	31 (39.2)	28 (60.9)	
Have you ever stopped smoking due to the warnings?			
No	74 (93.7)	38 (82.6)	0.05
Yes	5 (6.3)	8 (17.4)	
Do you consider report of health warnings on tumbac packages to be very important?			
No	28 (35.4)	10 (21.7)	0.05
Yes a lot	28 (35.4)	28 (60.9)	
Yes enough	12 (15.3)	5 (10.9)	
Yes poorly	11 (13.9)	3 (6.5)	

[Table/Fig-4]: Bivariate analysis taking real quit attempt duration as dependent variable.

with a real quit attempt duration of 1 month or more (60.9%) compared to the ones with real quit attempt duration of less than a month (35.4%) considered reporting health warnings on tumbac packages to be very important (p=0.05).

Multivariable Analysis

A first logical regression, taking the quit attempts as the dependent variable, showed that those who reported cough and expectoration for more than 3 weeks were significantly more likely (more than 8 times) to report >1 quit attempts, with those reporting high scores on the readiness to quit being significantly more likely to report >1 quit attempts (OR=2.78). Those who reported high motivation were significantly more likely to report >1 quit attempts (OR=2.27).

The second logistic regression, taking the quit attempts duration as the dependent variable, showed that persons less than 45 years would significantly have a quit duration of ≥1 month compared to smokers more than 45 years (OR=6.85), whereas smokers who think that reporting health warnings on tumbac packages to be

Regression 1: Logistic regression taking quit attempts as dependent variable.			
Factor	OR	95% Confidence interval	p-value
Cough and expectoration more than 3 weeks (no*/yes)	8.20	1.56-43.12	0.01
Readiness to quit	2.78	1.18-6.52	0.02
Mondor scale: low* vs high	2.27	1.02-5.08	0.04
Regression 2: Logistic regression taking real quit attempts duration as dependent variable.			
Factor	OR	95% Confidence interval	p-value
Age group: ≤45 vs >45 years*	6.85	1.40-33.40	0.02
LWDS-11: low vs high*	2.13	0.93-4.90	0.07
Do you consider report of health warnings on tumbac packages to be very important?			
Yes vs no*	3.09	1.18-8.13	0.04
Enough vs no*	1.43	0.37-5.46	
Poor vs no*	0.59	0.13-2.68	
[Table/Fig-5]: Multivariable analysis. *Reference group			

very important and important enough to significantly have a quit duration of ≥ 1 month (OR=3.09; OR=1.43) respectively. Smokers with low waterpipe dependence had quit attempts duration of ≥ 1 month compared to highly dependent smokers (OR=2.13; p=0.07) [Table/Fig-5].

DISCUSSION

The study results showed that the readiness to quit, a high motivation, a low waterpipe dependence and the presence of health warnings on tumbac packages were the factors associated with the past quit attempts and their length of abstinence. Factors associated with quit attempts and smoking cessation are similar to what was reported in literature on cigarette smoking [13-16].

The present findings showed that less smoking dependent patients had quit attempts duration of ≥ 1 month compared to the highly dependent ones. Previous findings showed that smokers with a higher level of nicotine dependence are less expected to make an attempt to quit and find it also more difficult particularly in the early phases of a quit attempt [17,18]. This may reflect more severe withdrawal symptoms, more marked fluctuations in the brain from nicotine exposure, perhaps an environment that does not allow to remain without smoking [17]. Being a highly dependent smoker suggest a greater negative affect and desire to smoke pre- and post-quit, irrespective of the cessation status and these factors are often correlated with relapse [19]. In fact, results showed that higher nicotine dependent smokers began smoking at a low age, stressing on the importance of avoiding nicotine use among young people [20]. Results also showed that dependent smokers often make multiple attempts to quit before succeeding, meaning that unsuccessful quitters should be encouraged to try again [13].

Resemblances may exist between cigarette and waterpipe smoking [21]. Waterpipe smoking is associated with a predominant social dependence that counteracts the neuro-pharmacological fluctuations, creating dependence; indeed, the more you smoke, the more barriers you would have to quit [22,23].

Being a highly motivated smoker was significantly associated with at least one quit attempt but not with its duration. However, to propose motivation is all what a smoker needs to quit is wrong. Motivation is the key for rapid action to quitting smoking; however, this is not enough to make sure that a person will stop smoking for a long period of time [24].

Cough and expectoration for more than 3 weeks per year were also shown to be associated with at least one quit attempt in this study.

In fact, in a similar comparison with cigarette quitters, more than 80% of the quitters who had a chronic cough at baseline when they were still smoking, reported cough cessation one year after stopping smoking. This applies to the wheezing and phlegm production as well, where both symptoms were reduced up to 5 years after smoking cessation. These findings are extremely encouraging for patients who have to be forewarned that decreases in their symptoms are expected once they stop smoking to improve their health status and reduce the subsequent rate of exacerbations [5,25].

Evidence on the relationship between age and quitting smoking is unreliable [17]. Multiple researches indicate a tendency for smokers who start smoking at a later age to be more expected to quit [18]. Based on these findings, delaying the onset of smoking by teenagers may increase their possibility of later quitting, however, there is no evidence to show that this strategy might be effective [26].

Current findings revealed a non-significant association between age and quit attempts, but a significant one between age and duration of a quit attempt. While younger smokers may be more likely to make a quit attempt, older people may be more likely to succeed [17]. However, smokers of older age are reluctant to quit because of the false beliefs that it is too late to quit since the damage has already been done, and/or that they will not profit much from quitting [27].

Warnings on the tumbac boxes were shown to be correlated with a duration of quitting attempts of ≥ 1 month in this study, reflecting the importance of warnings on packages in making smokers aware about the damage of smoking on health. In fact, there has been a surge in avoiding warning labels in Australia after the implementation of the graphic warnings in 2006, associated with increases in quit attempts [28].

LIMITATION

This study has several limitations. This is a cross-sectional design and therefore, we were unable to draw causal associations with such a design. The total sample size is small, withdrawn from three governorates in Lebanon, thus cannot be extrapolated to the whole population. The replication of this study in different settings and geographic locations would provide better generalisability of the results. A selection bias is still, however, possible because of the refusal rate. The use of a questionnaire in patients may not always be accurate: problems in question understanding, recall bias and over or under evaluating symptoms, can lead to a possible information bias.

CONCLUSION

The findings of this study enriched current knowledge about the waterpipe smoking quit attempts and duration of these attempts. Significantly more waterpipe smoking quit attempts were associated with a higher motivation and lower dependence respectively. Public health education programs and health care professionals' interventions are necessary to motivate smokers to quit and decrease dependence.

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