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Smoking social acceptability in Lebanese adults: Effect of age, gender, family influence, and residence

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ABSTRACT

Objectives: To investigate the interactions of sociodemographic factors that are associated with the acceptance or refusal of smoking in society.

Methods: A cross-sectional study was carried out between February 2017 and January 2018 using a proportionate cluster sample of 630 Lebanese adults. An index was constructed, the “smoking social unacceptability index”. This index is still in its initial stage and is based on two questions. A stratification analysis over age, gender, family influence, city of residence, and smoking status was carried out.

Results: The results of the linear regressions, taking the “smoking social unacceptability index” as the dependent variable where higher scores would indicate higher social smoking unacceptability (strongly agreeing on banning). The results showed that having a smoker at home (Beta = −0.664) and big city residency (Beta = −0.481) were significantly associated with a lower score on the “smoking social unacceptability index”. Being a smoker (Beta = −0.696) was significantly and highly associated with a lower score. Whereas female gender (Beta = −0.522) and higher education level (Beta = −0.358) were associated with a higher index score. Age and working status did not show a significant effect.

Conclusion: Gender, family influence, smoking status, big city residency, and education level would affect the attitude toward smoking bans. Public education and the implementation of adequate policies are necessary.

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Public Health Implications

Tobacco smoking in its various forms is an important public health issue, and efforts are made worldwide to control this phenomenon. Our study shows that there is a real problem with Lebanese people who are accepting smoking in their society, and this may explain in part why the law concerning smoking banning in public places failed to be implemented. Efforts should be exerted by concerned

health authorities to increase smoking unacceptability among relevant subjects, through implementing specific educational policies targeting each category of the population. More importantly, the right to health of nonsmokers must be emphasized and protected, without denying that smokers have the right to make their own choices. This issue should be considered when implementing smoking bans: setting convenient areas for smokers, and

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generating legislations that define the responsibility of restaurant owners, surveillance methods, condemnatory regulations and penalties will be helpful to improve smokers' compliance with the bans. Non-governmental organizations (NGOs), health organizations, and the Lebanese authorities must work jointly on group [1] smoking harm education and implementation of accessible and affordable smoking cessation programs for everyone, within the framework of the country's needs and available resources.

Introduction

Tobacco smoking is a leading cause of diseases and premature mortality worldwide. A report by the World Bank [2] expected that the number of smokers worldwide would increase to more than 1.6 billion by the year 2025.

The high prevalence of smoking in the Arab world and especially in Lebanon [3] may be due in part to the smoking acceptability in societies. The factors affecting acceptability are numerous. For instance, the myths and misconceptions usually driven by tobacco advertising [4] (like smoking as a symbol of personal freedom, the importance of tobacco in social and cultural interactions...) in addition to the lack of the Framework Convention on Tobacco Control (FCTC) mandated policy enforcement, allowing an everyday tobacco smoke exposure where the "omnipresence of smoking" gives the impression that smoking is highly welcomed. Such perception will affect the initiation of smoking as well as discourage cessation [4].

Oppositely, household smoking bans and restaurant smoking regulations show more negative attitudes about the social acceptability of smoking [5]. Tobacco control policies [6] have been set and implemented worldwide to decrease the burden of smoking and the World Health Organization (WHO) has emphasized smoke-free policies as a cornerstone for tobacco control policies [7]. Unfortunately, and despite those policies, people keep smoking for varieties of reasons including stressful life conditions; social and economic factors, as well as friends [8] and family [9] member models. These factors have been shown to be predictors for smoking initiation and establishment and make it difficult for smokers to abstain from smoking.

In Lebanon, the WHO FCTC [7] was ratified in 2005, but nothing was done to put it into practice, and enforcement remains low overall. Lebanon only succeeded in passing a tobacco control law

(law 174) [10] in August 2011 concerning health warning labels on tobacco product packages. This law failed to be implemented and Lebanese people continue to smoke [11] in public places and restaurants with the absence of enforcement on banning tobacco advertising and control of regulating policies [12]. High smoking prevalence is shown among men (43.2%) and women (33.8%) in 2013, and 36.2% of youth continue to smoke every day [3]. Waterpipe cafes (cafes specialized in offering waterpipe) continue to pop-out and attract people, relying on the argument that the hospitality sector will lose profit upon the introduction of smoking bans in restaurants and the lack of a comprehensive law that applies to all hospitality venues. [7]. Furthermore, in a country where economic problems have become a real burden, the price of tobacco products is really affordable since 1.91% of the gross domestic product [3] per capita is required to purchase 100 packs of cigarettes. To the authors' knowledge, studies tackling this issue are lacking in our Lebanese society, making it difficult to show the importance of the problem and to place it in the spotlight for policymakers in this country.

On the other hand, there are complex relationships between smoking and sociodemographic factors: for example, cigarette smoking is accepted among men much more than among women, particularly while waterpipe use is constantly rising among all gender and age categories, especially youth [4,13]. Age-related smoking acceptability seems to be gender related [14] but also depends on the education level [15] of respondents and on the presence of a smoker at their home [16]. Since studies in Lebanon about this topic are lacking, and since there is a real problem with people disagreeing with any tobacco control policy, we aimed at investigating the effect of sociodemographic factors that are associated with acceptance or refusal of smoking in this society.

Methods

A cross-sectional study was carried out between February 2017 and January 2018 using a proportionate cluster sample of Lebanese adults, taken from community pharmacies in Lebanon. A list of community pharmacies in the Greater Beirut and Mount Lebanon districts, provided by the Order of Lebanese Pharmacists, was used. The recruitment was performed by professional data collectors who received only the necessary information about the recruitment and inclusion/exclusion criteria, to minimize the possibility of bias.

Minimal sample size calculation

The prevalence of smoking (any smoked tobacco) for adults in Lebanon was found to be 34% [17]. A minimum sample size of 450 was calculated using Epi-info software version 7.2 (population survey) and needed to ensure a confidence interval of 95%. Six hundred and thirty participants were approached to take into account any refusal or exclusion.

Inclusion and exclusion criteria

All Lebanese adults who visited the pharmacies and who were able to read and understand Arabic were included in the study. However, those with a history of substance abuse, cognitive impairment, or psychiatric disorders were excluded. These excluded participants were well known by their community pharmacist who also had records of their medications list and medical history.

Ethical aspect

The study protocol was approved by the institutional review board of the Saint-Joseph University of Beirut, Lebanon (USJ-2016-53). An informed written consent was signed by each participant prior to recruitment.

Questionnaire

Data collection was performed through a questionnaire filling. The questionnaire included socio-demographic information (age, gender, educational level, smokers in the surrounding, urban residency, working status, etc.), behavior, and attitudes information. The smoking status was defined as follows: active smokers (participants who are actively smoking waterpipe and/or cigarette) and never smoked (participants who never smoked any type of tobacco).

Concerning the smoking social unacceptability, questions were adopted from a previous study [18]. These items were translated into Arabic. The translation process was as follows: First, a bilingual researcher forward-translated the questions into Arabic, then a second independent translator with no knowledge of the questionnaire back-translated the questions into English. Translation discrepancies were resolved by consensus between the researchers and the translator. These questions were pre-tested in a pilot sample of 20 individuals before being adopted in the final questionnaire. These 20 individuals were included in the final database since there were no major corrections to the questions.

The smoking social unacceptability index construction

The questions that formed the “smoking social unacceptability index” were:

1. Do you agree on banning smoking in cafes?
2. Do you agree on banning smoking for minors?

The response options were as follows: strongly disagree (1) disagree (2) agree (3), and strongly agree (4). The index was computed by adding the answers to the above-mentioned questions; it had a minimum of 2 (strongly disagree on banning smoking in cafes and minors) and a maximum of 8 (strongly agreeing on both). Higher scores would thus indicate higher social smoking unacceptability (strongly agreeing on banning). A reliability analysis was carried out on the social unacceptability index, with a Cronbach's alpha of $\alpha = 0.344$.

Statistical analysis

Data analysis was performed on SPSS software version 23 (Chicago, IL). Student's *t*-test and analysis of covariance (ANCOVA) were used to compare means and adjusted means between the different subgroups, respectively. Moreover, stratification analysis by age, gender, city residency, smoking status, and “having a smoker at home” was also performed to detect any confounding factor and to study their effect on the smoking social unacceptability index score. To perform stratification by age, we transformed the continuous variable age (in years) to a dichotomous variable (at the median level) including younger adults (age less than or equal to 40 years) and older adults (age more than 40 years). Regarding multivariable analysis, 12 linear regressions were performed, meeting the assumptions of normality by looking to the produced normality histograms, the correlation tables indicated the absence of collinearity, and homoscedasticity was checked using scatter plot and Levene's test for homogeneity of variances. Regressions took into account the variables in the bivariate analysis that showed a *p*-value < 0.2; in order to protect against residual confounding. The statistical significance was set at a *p*-value < 0.05.

Results

Sociodemographic characteristics of the participants

Out of 630 persons approached, a total of 581 participants (92.1%) were enrolled in this study. The mean age of the participants was 40.40 ± 13.81 years. Among those, 236 individuals (40.6%) never smoked, 338 persons (58.2%) were of male gender,

292 participants (50.3%) got a university degree, 322 participants (55.4%) were urban residents, 326 persons (56%) had at least one smoker at home, and 485 participants (83.5%) were currently working/students. The mean “smoking social unacceptability index” score for this sample was 6.70 ± 1.34 (median 7.00) with a minimum score of 2.00 and a maximum of 8.00 (Table 1).

Factors associated with smoking unacceptability

The bivariate analysis of the factors associated with the “smoking social unacceptability index” showed that male participants (6.44 ± 1.35) had a lower mean on the index compared to females (6.97 ± 1.25). In addition, participants who had a smoker at home (6.38 ± 1.40) had a significantly lower score on the index than those who did not have smokers at home (7.03 ± 1.15). Big city residents (6.52 ± 1.33) had lower mean scores on the “smoking social unacceptability index” (Table 2).

Table 1. Sociodemographic characteristics of the study participants.

Sociodemographic characteristics	Frequency (%)
Smoking status	
Never smoked	236 (40.6%)
Active smoker	345 (59.4%)
Gender	
Male	338 (58.2%)
Female	243 (41.8%)
Education status	
Non-university degree	289 (49.7%)
University degree	292 (50.3%)
Working status	
Not working	96 (16.5%)
Working	485 (83.5%)
Urban residency	
Non-urban resident	259 (44.6%)
Urban resident	322 (55.4%)
Smoker at home	
No	255 (43.9%)
Yes	326 (56.1%)
Smoking social unacceptability index	
Agree on banning smoking to minors	494 (85%)
Disagree on banning smoking to minors	87 (15%)
Agree on banning smoking in cafes/ restaurants	231 (41%)
Disagree on banning smoking in cafes/ restaurants	343 (59%)

The one-way ANCOVA adjusted means show that after adjusting for all the other variables, being a nonsmoker, female gender, not having a smoker at home, having a university degree, and not being a big city resident are significantly associated with higher social unacceptability. Age was not significantly associated with social unacceptability (Table 2 and Fig. 1).

Multivariable analysis

A first linear regression taking smoking social unacceptability index as the dependent variable in the whole sample shows that higher education level (Beta = 0.358) and female gender (Beta = 0.522) are associated with a higher score on the index. While having a smoker at home leads to a lower score on the index (Beta = -0.664) (Table 3). In a second linear regression taking smoking social unacceptability index as the dependent variable in the whole sample where the smoking status was added as a covariate, show that smoking status ($B = -0.696$) and having a smoker at home ($B = -0.239$) were highly associated with a lower index score and masked the effect of the other variables entered to the model.

Stratification analysis

Stratification by age

A third linear regression taking smoking social unacceptability index as the dependent variable in younger adults shows that higher education level (Beta = 0.327) and female gender (Beta = 0.829) are associated with a higher score on the index but having a smoker at home (Beta = -0.426) was associated with a lower score. While the fourth linear regression taking smoking social unacceptability index as the dependent variable in older adults shows that higher education level (Beta = 0.343) is associated with a higher score on the index while having a smoker at home (Beta = -0.904) decreased the index score (Table 4).

Stratification by gender

A fifth linear regression taking smoking social unacceptability index as the dependent variable in male participants shows that higher education level (Beta = 0.498) and higher age (Beta = 0.019) are associated with a higher score on the index. While having a smoker at home (Beta = -0.614) decreases the index score. The sixth linear regression taking smoking social unacceptability index as the dependent variable in female participants show that being an urban resident (Beta = -0.481), higher age

Table 2. Factors affecting smoking social unacceptability.

	Smoking social unacceptability index	P value	ANCOVA*	
			Adjusted means (Standard error)	p value
Age				
Young	6.68 ± 1.30	0.087	6.64 (0.072)	0.282
Old	6.73 ± 1.40		6.76 (0.076)	
Gender				
Male	6.44 ± 1.35	<0.001	6.50 (0.069)	<0.001
Female	6.97 ± 1.25		6.98 (0.084)	
Education status				
Non-university degree	6.49 ± 1.42	0.002	6.53 (0.074)	0.002
University degree	6.83 ± 1.23		6.87 (0.074)	
Working status				
Not working	6.93 ± 1.42	0.036	6.80 (0.137)	0.445
Working	6.61 ± 1.31		6.68 (0.057)	
Urban residency				
Non-urban resident	6.84 ± 1.32	0.004	6.80 (0.076)	0.049
Urban resident	6.52 ± 1.33		6.61 (0.069)	
Smoker at home				
No	7.03 ± 1.15	<0.001	7.06 (0.077)	<0.001
Yes	6.38 ± 1.40		6.41 (0.070)	
Smoking status				
Never smoked	7.57 ± 0.89	<0.001	7.49 (0.078)	<0.001
Active smoker	6.04 ± 1.23		6.10 (0.060)	

*Covariates are evaluated at the following values: education = 0.50, work = 0.83, age = 41.05, smoker at home = 0.56, city residency = 0.55, gender = 1.41, work status: 0.83, smoking status: 0.329.

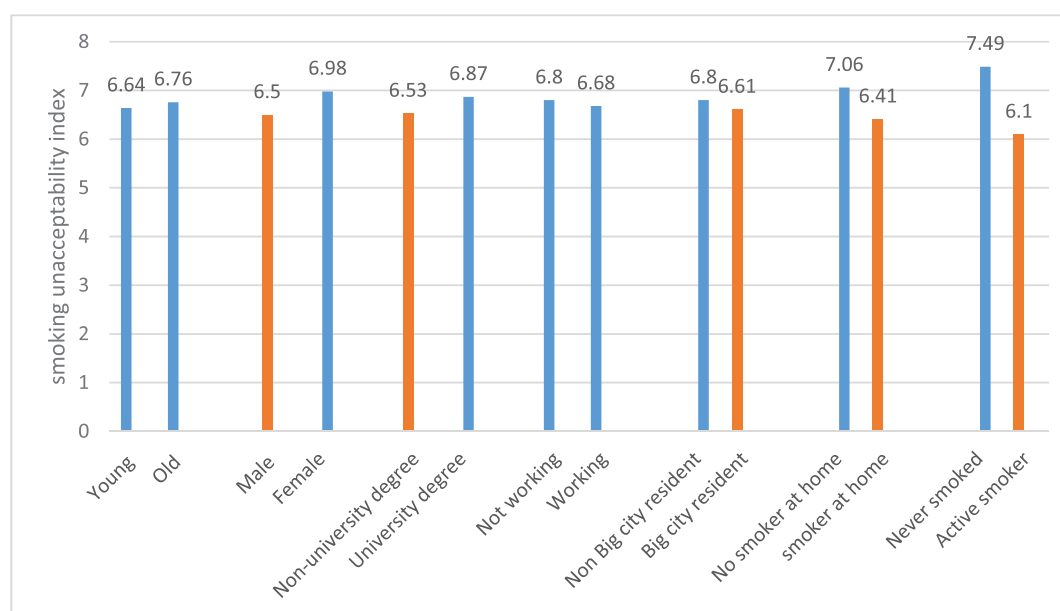
**Figure 1.** Adjusted means for smoking social unacceptability index across the different subgroups.

Table 3. Multivariable analysis.

Linear regression 1 taking smoking social unacceptability index as the dependent variable in the whole sample				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
University degree versus non-university degree*	0.358	0.134	0.142–0.574	0.001
Female versus male*	0.522	0.193	0.294–0.750	<0.001
Smoker at home versus no smoker at home*	–0.664	–0.249	–0.871 to –457	<0.001
Variables entered: smoker at home, age (in year), gender, city residency, education level, and work status.				
Linear regression 2 taking smoking social unacceptability index as the dependent variable in the whole sample				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Smoker versus non-smoker*	–0.696	–0.512	–0.798 to –0.594	<0.001
Smoker at home versus no smoker at home*	–0.239	–0.090	–0.430 to –0.048	0.014
Variables entered: smoker at home, age (in year), gender, city residency, education level, work status, and smoking status				

*Reference value.

(Beta = –0.012) and having a smoker at home (Beta = –0.678) are associated with a lower score on the index (Table 4).

Stratification by presence of a smoker at home

A seventh linear regression taking smoking social unacceptability index as the dependent variable in participants who did not have any smoker at home shows that higher education level (Beta = 0.448), higher age (Beta = 0.016), and female gender (Beta = 0.579) are associated with a higher score on the index. While the eighth linear regression taking smoking social unacceptability index as the dependent variable in participants who had a smoker at home show that the female gender (Beta = 0.490) is associated with a higher score on the index (Table 4).

Stratification by urban residency

A ninth linear regression taking smoking social unacceptability index as the dependent variable in participants who are non-urban residents showed that higher education level (Beta = 0.462), higher age (Beta = 0.015), and female gender (Beta = 0.723) are associated with a higher score on the index. While having a smoker at home decreased the index score (Beta = –0.661). A tenth linear regression taking smoking social unacceptability index as the dependent variable in participants who are urban residents shows that the female gender (Beta = 0.347) is associated with a higher score on the index. While having a smoker at home decreased the index score (Beta = –0.607) (Table 4).

Stratification by smoking status

An 11th linear regression taking smoking social unacceptability index as the dependent variable in participants who are nonsmokers showed that only the education level (B = 0.289) is associated with a higher index score. A twelfth linear regression taking smoking social unacceptability index as the dependent variable in participants who are active smokers showed that having a smoker at home (B = –.352) decreased the index score (Table 4).

Discussion

In this study, we created an index to assess the smoking social unacceptability. The mean “smoking social unacceptability index” score for this sample was 6.70 ± 1.34 with a median of 7.00. The relatively low mean may indicate that the majority of participants had no problem with smoking in restaurants and public spaces, knowing that in this sample, 59.4% are active smokers. Using the index, we found that nonsmokers, people with higher education level, and women in general agree with anti-smoking policies, contrary to participants who had a smoker family member. When smoking status was introduced in the model, the effect of education and gender were no longer statistically significant, showing that these two factors indirectly affect smoking acceptability through their influence on smoking per se. These results illustrate in some way the smoking regulation problems in other Arab countries [4,14,19].

Table 4. Multivariable analyses of social unacceptability—stratified models.

Linear regression 3 taking smoking social unacceptability index as the dependent variable in younger adults				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Female vs. male*	0.829	0.320	0.536–1.122	<0.001
Smoker at home versus no smoker at home*	–0.426	–0.165	–0.696 to –0.156	0.002
University degree versus non-university degree*	0.327	0.125	0.045–0.610	0.023
Variables entered: gender, city residency, education level, work status, and smoker at home.				
Linear regression 4 taking smoking social unacceptability index as the dependent variable in older adults				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Smoker at home versus no smoker at home*	–0.904	–0.326	–1.221 to –0.588	<0.001
University degree versus non-university degree*	0.343	0.120	0.014–0.673	0.041
Variables entered: gender, city residency, education level, work status, smoker at home				
Linear regression 5 taking smoking social unacceptability index as the dependent variable in participants with male gender				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
University degree versus non-university degree*	0.498	0.184	0.215–0.780	0.001
Age (years)	0.019	0.190	0.008–0.030	0.001
Smoker at home versus no smoker at home*	–0.614	–0.229	–0.888 to –0.338	<0.001
Variables entered: smoker at home, age (in year), city residency, education level, and work status.				
Linear regression 6 taking smoking social unacceptability index as the dependent variable in participants with female gender				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Big city resident versus non-big city resident*	–0.481	–0.192	–0.787 to –0.175	0.002
Age (years)	–0.012	–0.138	–0.024 to –0.001	0.034
Smoker at home versus no smoker at home*	–0.678	–0.268	–0.989 to –0.368	<0.001
Variables entered: smoker at home, age (in year), city residency, education level, and work status.				
Linear regression 7 taking smoking social unacceptability index as the dependent variable in participants not having a smoker at home				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
University degree versus non-university degree*	0.448	0.194	0.171–0.725	0.002
Age (years)	0.016	0.186	0.005–0.026	0.004
Female versus male*	0.579	0.245	0.263–0.896	<0.001
Variables entered: gender, age (in year), city residency, education level, work status.				
Linear regression 8 taking smoking social unacceptability index as the dependent variable in participants having a smoker at home				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Female versus male*	0.490	0.174	0.168–0.813	0.003
Variables entered: gender, age (in year), city residency, education level, and work status.				
Linear regression 9 taking smoking social unacceptability index as the dependent variable in participants who are not big city residents				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
University degree versus non-university degree*	0.462	0.175	0.152–0.772	0.004
Age (years)	0.015	0.158	0.003–0.026	0.013
Female versus male*	0.723	0.273	0.403–1.043	<0.001
Smoker at home versus no smoker at home*	–0.661	–0.251	–0.958 to –0.975)	<0.001
Variables entered: gender, age (in year), education level, work status, and smoker at home.				

Continued

Linear regression 10 taking smoking social unacceptability index as the dependent variable in participants who are big city residents				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Female versus male*	0.347	0.127	0.023–0.672	0.036
Smoker at home versus no smoker at home*	–0.607	–0.226	–0.897 to –0.317	<0.001
Variables entered: gender, age (in year), education level, work status, and smoker at home.				
Linear regression 11 taking smoking social unacceptability index as the dependent variable in participants who are nonsmokers				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
University degree versus non-university degree*	0.289	0.160	0.037–0.540	0.025
Variables entered: gender, age (in year), education level, work status, smoker at home, and city residency.				
Linear regression 12 taking smoking social unacceptability index as the dependent variable in participants who are active smokers				
Factor	Unstandardized Beta	Standardized Beta	95% CI	p-value
Smoker at home versus no smoker at home*	–0.352	–0.135	–0.631 to –0.073	<0.013
Variables entered: gender, age (in year), education level, work status, smoker at home, and city residency.				

*Reference value.

First, being a smoker could be a natural obstacle against smoking bans due to the biological needs for nicotine [20]. Being a smoker while having a smoker family member [16] also increased smoking social acceptability. In fact, smokers perceive smoking-free [21] policies as a threaten for their freedom in choosing when and where to smoke. This attitude is particularly promoted in the presence of a smoker at home [22]. Oppositely, education [15] level was a key element for nonsmokers to accept or not smoking in their society since a higher education level is usually associated with higher socioeconomic class and higher harm perception.

Second, urban residents in general seem to disagree on banning smoking. This finding may be explained by the fact that people living in cities do not have access to outdoor leisure activities, so they prefer restaurants and cafes gatherings with their friends around a waterpipe session, for example, particularly since smoking lounges offer an alternative social outlet [8] ignoring the harm of second-hand smoke for others [23]. Furthermore, urban residents' life rhythms are relatively stressful, finding in smoking a way to relieve stress [24,25] and boost morale. Although the majority of the participants agreed on banning smoking for minors (Table 1), there is still a tradition issue with waterpipe smoking, so that it is socially acceptable for a father to offer his teenage child a puff of waterpipe during a family gathering session around a waterpipe [26].

This study also revealed many interesting differences between the factors affecting smoking social acceptability in society; stratification analysis allowed a deeper investigation of these differences. Stratification by gender showed some interesting points: As

such, women agreed with anti-smoking policies even if they were urban residents. This may be due to the fact that city ladies are more educated, they have more access to anti-smoking campaigns [27], and are more aware and interested in smoking harm for themselves and for their family members (women in childbearing age in particular) [23,28]. However, although women in general had a higher social unacceptability of smoking, women who had smokers in their household and are urban residents disagreed on banning smoking. Men have a higher social acceptability of smoking in general, but those who got higher education levels and who were older in age were more prone to agree with anti-smoking policies; this is expected since both education [15] and experience in life help in controlling attitudes. Further research on the gender difference issue is needed.

The education level had also a strong influence on the attitude of the participants, even after stratification. In fact highly educated people may develop self-reinforcing norms about smoking acceptability and quitting smoking [29] since the education level [15] allows to perceive the harm of smoking and maybe refrain a person from starting smoking if environmental (availability and easy access to tobacco products, and willingness to try some influenced by family members and peers) and biological (genetic predisposition to dependence) [20] factors allow this. Education may lead that even active smokers will be aware of smoking dangers and second-hand smoke emissions [23], and accept smoking regulations policies [30].

Finally, national tobacco surveillance in the Arab world is shown to be poorly organized and available surveillance data are used ineffectively so that policy-

making is failing to implement adequate laws. What is known is the high prevalence of cigarette smoking among Arab men compared to women; second, waterpipe smoking is emerging as a major tobacco use method, especially among youth and women [4]. Furthermore, while the effect of gender and education was indirect and confounded by active smoking, having a smoker family member was found to be independently associated with high acceptability of smoking, whatever the active smoking status. This is in agreement with the fact that family models exert an important role in accepting smoking in society. Family [16,31] member's models [32], second-hand smoking [23], and peer [8] pressure exert an important influence so that even nonsmokers with smoking relatives may accept sitting in lounges where smoking is allowed and may even opt to engage in waterpipe smoking as part of the social bonding experience (general observation). These facts could be important predictors for the initiation and establishment of smoking behaviors, as well as in accepting smoking in the surrounding in Lebanon as well as in the surrounding Arab nations.

Study limitations

The present study has several limitations. The development of the unacceptability index is still in progress. More items need to be developed to better tap the constructs, to improve the internal consistency, and actions for validations need to be performed. Therefore, more items should be added to improve the reliability value. Further studies that overcome these drawbacks and confirm our results are necessary. Concerning the type of tobacco for each smoker, we did not use these details in the current study because it will be interesting to show the disparities of attitudes and beliefs between the cigarette vs. the waterpipe subgroups and go into details of these differences, which will be the objective of a future work. A selection bias is possible since the participants were recruited from Beirut and Mount Lebanon pharmacies, so this sample does not geographically represent the whole general Lebanese population and might even over or underrepresent subjects with chronic and infectious diseases. Questions about parenthood and stress levels were unfortunately not considered although they would have shown interesting results. There are also different information biases present in the study since participants may have changed in their attitudes leading to social desirability bias. Although a multivariable analysis was done for each stratum separately; some variables may have been left not studied which may cause some residual confounding, such as

stress level of individuals. Further research projects taking into account all these drawbacks are suggested.

Conclusion

Smoking social acceptability is a major obstacle facing smoking control policies implementation, especially in a developing country like Lebanon. We created an index to assess smoking social unacceptability and we found that there is a real problem with Lebanese people accepting smoking in their society. Many factors can affect the population's attitudes towards smoking in public. Age, gender, family influence, education, and urban residency were assessed and were found to be key factors. From this point, further studies should be made and the implementation of a more detailed and more reliable smoking unacceptability index. This may help policymakers to understand the problem and together with NGOs and social activists work on the implementation of education programs and new policies in Greater Beirut and Mount Lebanon. May these new policies be spread to the other Lebanese districts leading to pass a new tobacco control law that will not fail to be implemented.

Conflicts of interest

The authors declare that there is no conflict of interest related to this article.

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