Comparison of Cigarette and Waterpipe Smoking Among Pupils in the urban area of Sousse, Tunisia

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Comparaison De La Consommation De Cigarettes Et De Narguilé Chez Les Elèves De La Ville De Sousse

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RÉSUMÉ

Prérequis : La consommation de tabac par le narguilé est en train de devenir populaire partout dans le monde.
But : Déterminer la prévalence du tabagisme de cigarette et du narguilé chez des élèves de 13 à 17 ans dans la région de Sousse et identifier les facteurs prédictifs de la consommation de cigarette et de narguilé dans cette population.
Méthodes : Nous avons réalisé une étude descriptive avec un échantillon représentatif d'élèves âgés de 13 à 17 ans dans des collèges de la ville de Sousse. Nous avons utilisé un questionnaire pré-testé et auto-administré pour mesurer la consommation de tabac. Un seuil de signification de 5% a été choisi. Le logiciel SPSS 10.0 à été utilisé pour l'analyse statistique des données.
Résultats : Nous avons interrogé 1569 élèves dont 52% des garçons. La moyenne d'âge de la population était 15±1,5 ans. La population d'élèves qui ont déjà fumé la cigarette et ceux qui sont fumeurs actuels était respectivement 13,1% et 7,6%. La proportion d'élèves qui ont déjà fumé le narguilé et ceux qui sont fumeurs actuels était respectivement de 19,3% et 52%. La proportion de fumeurs de cigarette et de narguilé était supérieure chez les garçons et les plus âgés. L'analyse multi-variée a montré une relation significative entre les deux formes de tabagisme.
Conclusion : Une augmentation de la surveillance et des recherches serait nécessaire pour maîtriser ce problème de santé publique.

Mots-clés
Tabac, épidémiologies, éléves

SUMMARY

Background: Epidemiological and observational evidence suggests that waterpipe use is growing in popularity worldwide
Aim : The purpose of this study was to examine the prevalence of cigarette and water pipe tobacco use among pupils aged 13–17 years in the urban area of Sousse, Tunisia and to identify the factors which predict current cigarette and/or waterpipe smoking in this population.
Methods: A cross-sectional study was carried out on a representative sample of schoolchildren aged between 13 and 17 years in colleges and public secondary schools of the urban area of Sousse. We used a pre tested and self administered questionnaire to measure tobacco consumption. The significance level for all analyses was $p<0.05$. Statistical analysis was conducted with SPSS 10.0 software.
Results: Participants were 1569 youth. Fifty two percent of them were male. The mean age of the sample was 15±1.5 years. Total cigarette smoking percentage for ever and current use were 33.1% and 7.6% respectively. Total water pipe smoking percentage for ever and current use were 19.3% and 5.2% respectively. Overall, the total percentages of cigarette and water pipe smoking (ever and current) were higher for male and aged pupils. Multivariate regression analyses showed that the two types of tobacco use were related.
Conclusion: Despite the growing adoption of water-pipe smoking, there remains limited research in this area. Increased surveillance and additional research are necessary to address this growing threat to public health.

Key-words
Tabacco, epidemiology, pupils

مقارنة بين التدخين بالسَجائر و بالنرجيلة عند التلاميذ في مدينة سوسة

الباحثون : إ.هرابي ، ج.معتوق معلول ، ر.قحة ، ر.قبايلي ، و.مزياق ، هـ.غنام

الهدف من هذه الدراسة هو تحديد نسبة آنتشار التدخين بالسجائر و بالنرجيلة عند التلاميذ الذين تتراوح سنهم بين 13 و 17 سنة في جهة سوسة .قمنا بآستجواب 1569 تلميذا ٪ 52(منهم من الذكور)نستنتج أنه يجب التكثيف من الأبحاث و من المراقبة للتغلب على هذا المشكل الذي يمس الصحة العمومية.

الكلمات الأساسية : تدخين - وبائيات - تلاميذ

Water pipe, also known as a hookah, narghile, or shisha-pipe, consists of a head into which tobacco mixture is placed, a body, a water bowel, and a hose through which the user inhales (figure 1). Waterpipe smoke contains many of the same toxicants as cigarette smoke [1,2]. Not surprisingly, high levels of carbon monoxide is found in waterpipe users' breath [3-5] and nicotine is found in their blood [6], to the extent that blood nicotine of daily waterpipe users is similar to that of an individual who smokes 10 cigarettes per day [7]. Although more research is needed, waterpipe tobacco smoking is shown to be associated with substantial harm to smokers, can harm non-smokers exposed to waterpipe smoke, and is associated with and tobacco/nicotine dependence [3,5,8-10].

Figure 1 : water-pipe

Epidemiological and observational evidence suggests that waterpipe use is growing in popularity worldwide [3,11,12],essentially in the Eastern Mediterranean region (EMR). Although we are learning more about waterpipe tobacco smoking among youths, there is little information concerning how common this form of tobacco use is among Tunisian and north African students. The behavior clearly can appeal to this age group; surveys indicate previous 30-day waterpipe tobacco smoking rates as high as 25% among Lebanese highschool students [13], and 22% among a sample of Arab American highschool students in the US Midwest [14]. The most compelling evide for the spread of waterpipe smoking among youths in the EMR comes from the Global Youth Tobacco Survey (GYTS) involving more than 90,000 students (13-15 years) from 20 countries in the Middle East The GYTS showed that past month non-cigarette tobacco use (mostly waterpipe) was reported by 15.6% of boys and 9.9% of girls [15]. However, to the best of our knowledge specific country studies looking waterpipe use among youths in Tunisia have not been reported.

Tunisia is located in the northeast of Africa and according to the 2004 Census, the Tunisian population is 9 910 872 inhabitants. The city of Sousse is the third largest town of the country with a population of 544 413 inhabitants.

The purpose of this study is to examine the prevalence of cigarette and waterpipe tobacco use among highschool and college students aged 13–17 years in the urban area of Sousse, Tunisia and to identify factors associated with these smoking behaviors among target youths.

MATERIALS AND METHODS

Study design

A cross-sectional study was carried out on a representative sample of schoolchildren aged between 13 and 17 years, in college and public secondary schools of the urban area of Sousse, Tunisia in 2003.

Participants

The studied population was composed of schoolchildren aged between 13 and 17 years, which were recruited in randomly selected cluster samples. First cluster was constituted by the randomly selected classes within these establishments.

The sample size should permit to estimate the prevalence of tobacco use with a precision of ±2.5% and a confidence level of 95%, the needed sample size was 1600.

Data collection:

We used a self administered questionnaire to measure tobacco consumption by frequency of smoking, age of commencement and age of regular use.

Tobacco use included

(1) Ever, defined as ever smoking a cigarette and/or water pipe, even a few puffs.

(2) Current, defined as smoked cigarettes or water pipe in the past month

Statistical Analysis

Descriptive statistics including means, SDs, and percentages were used to describe waterpipe and cigarette-smoking behaviors. Chi-square test was used to compare smoking categories proportions across age and gender.. Logistic regression analysis was used to examine factors related to daily waterpipe or cigarette smoking, wherby factors showing significant associations with our main outcome in the univariate analysis were entered in the model simultaneously. The significance level for all analyses was $p<0.05$. Statistical analysis was conducted with SPSS 10.0 software.

Ethical considerations

Appropriate ethical protocols were followed. Authorization was sought and obtained from the Ministry of Education and from the participants' schools, teachers and parents for their participation.

RESULTS

Participants were 1569 youth. Fifty two percent of them were male. The mean age of the sample was 15±1.5 years. Total cigarette smoking percentage for ever and current use were 33.1% and 7.6% respectively. Total water pipe smoking percentage for ever and current use were 19.3% and 5.2% respectively.

Table 1 presents the percentages for ever and current cigarette

and water pipe smoking by age and gender. Cigarette and water pipe smoking increased significantly with age ($p<10^{-3}$) (table1). Among 13 years old students, 18.5% and 9.7% had respectively ever smoked cigarettes and water pipe. Among those aged 17 years old, 43.4% and 29.2% had respectively ever smoked cigarettes and water pipe. Likewise, the proportion of students who are current cigarette and water pipe smokers moved up from 1.6% and 1.1% to 11.9% and 11%.

Table 1 : Percentage of cigarette and water pipe smoking by age and gender

	Cigarette smoking		Water-pipe smoking		n
	Ever	Current	Ever	Current	
Total smoking percentages	33.1	7.6	19.3	5.2	1569
Age (year)					
13	18.5	1.6	9.7	1.1	437
14	26.1	7.8	15.8	3.9	180
15	33.5	6.7	17.3	3.8	209
16	43.1	10.8	25.8	6.1	425
17	43.7	11.9	29.2	11.0	381
Gender					
Male	49.7	14.7	33.0	10.6	748
Female	18.0	1.1	7.6	0.2	821

Gender comparison shown that compared with females, males reported more frequent ever use of a water pipe (33% vs 7.6%, $p<10^{-3}$) and more frequent use of water pipe (10.6% vs 0.2%, $p<10^{-3}$). These differences by gender were also noticed for cigarette smoking with significant difference ($p<10^{-3}$).

The proportion of students who had the intention to smoke in the future was significantly more important among ever and current cigarettes and water pipe smokers (table 1).

In multivariate analysis (table 2), the odds of current cigarette smokers were higher among students who had the intention to smoke cigarettes in the future (OR=15.82, IC [7.65 – 32.7]), water pipe smoker (OR=7.39, IC [3.39 – 16.11]), males compared with females (OR=2.71, IC [1.13 – 6.48]), and who ever consume alcoholic drinks (OR=1.3, IC [1.16 – 1.46]).

Table 2 : Significant predictors for current cigarette smoking (n=1569)

		95% CI	
Variables in equation	**OR**	**Lower**	**Upper**
Intention to smoke cigarettes in the future	15.82	7.65	32.70
Water pipe smoker	7.39	3.39	16.11
Gender : male/female	2.71	1.13	6.48
Ever consume alcoholic drink	1.30	1.16	1.46

The odds of current water pipe smokers (table 3) were higher among males compared with females (OR=32.68, IC [4.38 – 243.57]), cigarettes smoker (OR=11.82, IC [5.88 – 23.74]), older compared with younger students (OR=2.03, IC [1.16 – 3.54]) and who ever consume alcoholic drinks (OR=1.15, IC [1.02 – 1.30]).

Table 3 : Significant predictors for current water pipe smoking (n=1569)

		95% CI	
Variables in equation	**OR**	**Lower**	**Upper**
Gender : male/female	32.68	4.38	243.57
Cigarette smoker	11.82	5.88	23.74
Age	2.03	1.16	3.54
Ever consume alcoholic drink	1.15	1.02	1.30

DISCUSSION

The findings show differences in tobacco use patterns among the schoolchildren aged 13-17 years in the urban area of Sousse, Tunisia.

Total cigarette smoking percentage for ever and current use were 33.1% and 7.6% respectively. Total water pipe smoking percentage for ever and current use were 19.3% and 5.2% respectively. Overall, the total percentages of cigarette and water pipe smoking (ever and current) were higher for male and aged pupils. Multivariate regression showed that the two types of tobacco use were related.

The prevalence results are consistent with reports from college campuses [16-18] and highlight the need for intervention to prevent water-pipe smoking among youth with the same interest in tobacco. But our results are different then most Middle East countries where the prevalence of water pipe smoking is more common than cigarette smoking [19]. For example in Iraq, based on GYTS results, 7.4% of students aged 13--15 years reported having ever smoked cigarettes, 12.9% had ever smoked shisha, 3.2% currently smoked cigarettes, and 6.3% currently smoked shisha [20].

In our sample, water-pipe smoking was more common among older youth. This result is the same in the study of Primak and al [21] which moved up from 0.8% in the sixth grade to 7.3% in the twelfth grade. These observations are similar to uptake patterns of other substance use [22], likely reflecting the new environmental and social milieu of high school.

It was interesting that water-pipe smoking was the strongest predictor of current cigarette smoking while current cigarette smoking was the strongest predictor of current water-pipe smoking. These findings were also reported by Wegliki and al [23]. Youth were 11.0 times more likely to be currently smoking cigarettes if they currently smoked water pipes. They were also 11.0 times more likely to be current water-pipe smokers if they were currently smoking cigarettes.

It would appear that smoking, regardless of type, may be a gateway to the use of other forms of tobacco [24], or youth may be substituting cigarettes with water pipes, or vice versa [25]. It is also possible that youth who first smoke cigarettes believe that if they smoke water pipes, they are not adding to their tobacco addiction or tobacco burden and, therefore, are not exposing themselves to the well recognized health risks of cigarette smoking [26]. Epidemiological and observational evidence suggests that waterpipe use is growing in popularity

worldwide [27,28]. It is widely and erroneously perceived to be less lethal than other forms of tobacco use. More research is needed on its addictive properties, and on the associated health risks, both for users and exposed non-smokers. Evidence-based information about waterpipe's addictive and harmful properties should be developed and disseminated in order to deglamourise and denormalise its use. High quality randomized trials are needed to guide treatment of waterpipe smoking [29]. Like cigarettes, alternative forms of tobacco use need regulatory measures that are adapted to local situations and supplemented by preventive measures within the World Health Organization's Framework Convention for Tobacco Control [19].

CONCLUSION

Despite the growing adoption of water-pipe smoking globally, there remains limited research in this area. Increased surveillance and additional research are necessary to address this growing threat to public health.

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