

Characteristics associated with the use of waterpipe in young adults in a university of Southern Brazil

Características associadas a utilização do narguilé em adultos jovens em uma universidade do sul do Brasil

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ABSTRACT

Introduction: Alternative forms of tobacco have gained popularity around the world. The waterpipe refers to an instrument that contains water at its base, where tobacco smoke passes before inhalation, being as harmful as conventional cigarettes. The use of waterpipe exposes smokers to nicotine and combustion products, as well, as relevant concentrations of other toxic compounds. **Objective:** To characterize the patterns of consumption and exposure to waterpipe in young adults at a University in Southern Brazil. **Methods:** Analytical observational study, cross-sectional, that included university students using waterpipe. A questionnaire was applied and the characteristics of the sample and the variables studied were analyzed, showing the absolute and relative frequencies, as well as measures of central tendency and dispersion. **Results:** 117 users were included with 20.6 ± 2.96 years old, the majority were women and students from health sciences areas. The average age of the first experiment was 16.5 ± 3.03 years old. The frequency of consumption is twice a month and the time per session was over 30 minutes in 62% of cases. Almost of student not is considered addicted and 53% believe that the waterpipe is less addictive and that its use is less or equally harmful to cigarettes. **Conclusion:** Most users had their first contact with tobacco through the waterpipe during their teens. The use of waterpipe smoking perhaps to be associated with a misperception about the real effects of the use of waterpipe on health.

RESUMO

Introdução: As formas alternativas de tabaco ganharam popularidade no mundo. O narguilé refere-se a um instrumento que contém água na sua base, por onde passa a fumaça do tabaco antes da inalação, sendo tão prejudicial quanto o cigarro convencional. O uso de narguilé expõe os fumantes à nicotina e aos produtos de combustão, assim como, concentrações relevantes de outros compostos tóxicos. **Objetivo:** Caracterizar os padrões de consumo e exposição ao narguilé em adultos jovens em uma Universidade do Sul do Brasil. **Métodos:** Estudo analítico observacional, de caráter transversal, composto por estudantes universitários usuários de narguilé. Foi aplicado um questionário e realizou-se análise das características da amostra e das variáveis estudadas, apresentando as frequências absoluta e relativa, bem como medidas de tendência central e dispersão. **Resultados:** Foram incluídos 117 usuários que possuíam, em média, $20,6 \pm 2,96$ anos, sendo a maioria mulheres e estudantes de áreas da saúde. A média de idade da primeira experimentação foi de $16,5 \pm 3,03$ anos. A frequência de consumo foi, em média, duas vezes ao mês e o tempo por sessão foi superior a 30 minutos em 62% dos casos. Quase a totalidade da amostra não se considerava viciada e 53% acreditavam que o narguilé é menos viciante e que seu uso seja menos ou igualmente prejudicial ao cigarro. **Conclusão:** A maioria dos usuários teve o primeiro contato com o tabaco através do narguilé ainda na adolescência. O ato de fumar narguilé parece associado a uma percepção equivocada sobre os efeitos reais do narguilé sobre a saúde.

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Introduction

The use of tobacco remains the leading preventable cause of morbidity and mortality worldwide. Each year, more than one million smokers die prematurely and, although conventional cigarettes continue to be the main cause of these rates¹, the use of alternative forms of tobacco products is gaining popularity in the world². Among the alternative forms, there is the waterpipe, which consists of an instrument that contains water at its base, through which tobacco smoke, usually with a fruit flavor, passes before inhalation^{3,4}. The use is associated with the belief that it is tobacco smoke passes through the water before being inhaled, it will be less harmful to human health, as it becomes purer⁵.

Currently, waterpipe is considered a symbol of cultural identity and social sharing used mainly by young adults⁶⁻⁸. However, it may be related to transitions associated with adulthood, including increased independence, separation from parental figures, and higher tendencies to engage in risk behaviors, as well as

part of identity exploration⁹. According to several epidemiological studies, the propagation of this habit is related to (a) introduction of tobacco with pleasant flavors and aromas¹⁰; (b) perception that it is "healthier" than conventional cigarettes³; (c) social acceptance¹⁰ and (d) internet and social media advertisements by tobacco companies¹⁰.

Despite the belief that the waterpipe is less harmful than the cigarette, it is known that both contain nicotine and combustion products¹¹ and that the waterpipe contains relevant concentrations of toxic compounds compared to cigarette smoke¹², such as the amount of tar and carbon dioxide, and polycyclic aromatic hydrocarbons¹³. Moreover, important to note that waterpipe smokers also inhale more smoke in a single inhalation, being exposed to more toxic substances than cigarettes¹⁴.

The epidemiological scenario indicates that waterpipe has quickly replaced cigarettes in the Middle East as the most popular method of tobacco use among

young people and, in several other parts of the world, it is second only to cigarettes ¹⁵. It is estimated that waterpipe is consumed by about 100 million people worldwide ¹⁵, and is associated with diseases typically caused by cigarette use, such as lung cancer, mouth cancer, cardiovascular and respiratory diseases ⁴. In Brazil, some research also proves the growth of its popularity among young people ^{5,16}, mainly as a form of first contact with tobacco, which makes it the most prevalent form of tobacco use among young students ¹⁷.

Given the recent global spread use of waterpipe and the growing evidence of its harmful effects on health and its potential dependence, information on the characteristics associated with this modality of tobacco use is crucial for planning prevention interventions and policies ¹⁷. Designing these public policies based on the characteristics raised will be extremely relevant, since the use of waterpipes is a predictor of subsequent initiation of other tobacco products, as well as being considered a “gateway” to regular smoking ^{18,19}. Thus, the objective of the present study is to characterize the patterns of consumption and exposure to waterpipes in young adults at a University in Southern Brazil.

Methods

The present study was characterized as an observational analytical, and cross-sectional, and was approved by the Research Ethics Committee of the Universidade do Sul de Santa Catarina, no. 04197618.50000.5369. The study population consisted of waterpipe-using students from on-site undergraduate courses at the Universidade do Sul de Santa Catarina (UNISUL), from Campus Pedra Branca, enrolled in the first period of 2019.

The sample was of the probabilistic stratified, and the population was divided into subgroups according to the undergraduate courses. The sample of this study included undergraduate students, waterpipe users, aged 18 years old or over, regularly enrolled in at least one learning unit course at Campus Pedra Branca, and who signed an informed consent form. Participants who answered the questionnaire incompletely were excluded.

To perform the sample calculation, the total population of students enrolled in on-site courses at Campus Pedra Branca in 2018 (approximately four thousand) was considered and the calculation was performed considering the rate of waterpipe use published in a previous study (28%) ²⁰. Thus, the estimated minimum sample size was 91 participants.

To investigate the use of waterpipes, a questionnaire was used based on central questions proposed by Maziak et al. ²¹. These questions are available in English and have not yet been cross-culturally adapted for Brazilian Portuguese. However, to carry out this study, the questionnaire was translated from the original English into Portuguese, by two translators who were not involved in this research. The version used in the present investigation was the synthesis of the two

translations.

The questionnaire consists of 28 questions organized into five sessions: (a) basic consumption patterns (three questions); (b) dependence/cessation (six questions); (c) exposure (four questions); (d) broader aspects (nine questions); and (e) relationship with norms/regulation (six questions). In addition, a questionnaire with basic questions for sociodemographic also applied.

On previously authorized days, the researchers visited the classrooms and explained the research objectives. Students who agreed to participate in the study signed the informed consent and then responded to the questionnaire.

For statistical analysis, all the questionnaires applied were reviewed and inserted into a spreadsheet in Microsoft Excel. Later, this spreadsheet was imported into the Stata, version 15.0. To verify the distribution of data, the Kolmogorov Smirnov test was used. A descriptive analysis was performed, presenting the absolute and relative frequencies, and measures of central tendency and dispersion.

Results

Data collection took place between March to April of 2019, with 427 university students invited. Of these, 117 were waterpipe users and were included in the sample. The mean age of the participants was 20.6 ± 2.96 years, the majority were female (67.5%) and students of health sciences courses (88%).

Students included tried waterpipe for the first time at 16.5 ± 3.03 years and, since the beginning of waterpipe consumption, 51.3% reported that the frequency of consumption decreased, 40.2 % remained the same and 8.5% reported increased use. Additionally, waterpipe consumption occurred twice a month, and the time spent in each waterpipe session was more than 30 minutes in 62.2% of cases. More information related to waterpipe consumption is presented in Table 1.

Table 1. Characteristics of habits waterpipe consumption.

	N	%
Number of waterpipes/heads, months		
Less than 1	71	68.3
1 to 4	24	23.1
5 to 8	07	6.70
9 to 12	02	1.90
Substance that smokes		
Flavored tobacco	57	51.4
Unflavored Tobacco	02	1.80
Tobacco-free products	13	11.7
Product mix	05	4.50
Don't know what to smoke	34	30.6
Smoke with whom?		
Friends	108	95.6
Family	04	3.50
Alone	01	0.90

Place where smoke		
House	15	13.3
Friend's house	59	52.2
Public places	17	15.0
Others place	22	19.5
Waterpipe sharing		
Yes	98	91.6
No	09	8.40
The first tobacco-based product used		
Waterpipe	49	44.9
Cigarette	38	34.9
Electronic cigarette	15	13.8
Cigars	02	1.80
Non-drug tobacco	01	0.90
Other products	04	3.70
The place to buy waterpipe supplies		
Internet	06	5.60
Cafes	03	2.80
Friends' family	47	43.9
Retail stores	25	23.4
Others	26	24.3

Regarding the perception that individuals had about consumption, 94% of users did not consider themselves addicted (n=110), and 53.3% believed that it is less addictive than cigarettes (n=57). In addition, 53.2% of young people considered their use to be low and/or equally harmful compared to cigarettes. Still, regarding health risks, 54.7% (n=58) did not notice any type of potential damage to health in the parts of the device and 74.1% mentioned that they never read the label of the products used (n=80). Other aspects related to perceptions about waterpipe consumption and intentions are shown in Table 2.

Table 2. Perceptions about waterpipe consumption and intentions.

	N	%
Considered addicted		
Yes	7	6.00
No	110	94.0
Need to smoke nicotine-based products in the absence of waterpipe		
Yes	8	6.80
No	109	93.2
Ability to become addicted, compared to cigarettes		
Less addictive	57	53.3
Most addictive	13	12.1
Equally addictive	25	23.4
They do not know	12	11.2
Health harm compared to smoking		
Less harmful	24	22.0

More harmful	42	38.5
Equally harmful	34	31.2
They do not know	9	8.30
Quit smoking at least once with a view to permanent cessation		
Yes	65	56.5
No	50	43.5
Intends to stop smoking waterpipe		
No	44	43.1
Next month	17	16.7
In the next six months	01	1.00
In the future	40	39.2
Cost perception		
Cheap	35	33.3
Reasonable	57	54.3
Expensive	13	12.4

Discussion

In the present investigation, waterpipe was the first tobacco-based product used by most individuals. Flavored tobacco was consumed by most of the sample, which often shared the same waterpipe with friends. In addition, it was common to report that waterpipe is low addictive and equally/low harmful than cigarettes, data that are corroborated by the high percentage of individuals who did not show a desire to quit smoking.

The data obtained indicated that individuals tried waterpipes for the first time, in mean at 16 years old. Patterns of increasing waterpipe use among young adults may be, in part, reflect transitions associated with adulthood, including increased dependence, separation from parental figures, and higher tendencies to engage in risk behavior⁹. In Brazil, some studies also show the growing popularity of waterpipe among young people^{5, 16}, mainly as a form of first contact with smoking, which makes it the most prevalent form of tobacco use among students⁵.

In the present study, most individuals reported consumption of flavored tobacco. The flavoring of waterpipe is a factor that contributed to its rapid global spread, through the production of a smooth and aromatic smoke, making it more attractive, changing the tobacco flavor, and reducing the degree of throat irritation²². Emerging evidence suggests that flavors can contribute to the use of other tobacco products and subsequent addiction to nicotine²³, considering the misperception that this makes it low harmful, a fact that favors the initiation and maintenance of waterpipe smoking habit²⁴.

Concerning consumption habits, most of the sample reported sharing waterpipe, especially with friends. This finding strengthens the idea that its use is considered a symbol of cultural identity and social sharing⁶⁻⁸. Despite the incorrect perception, waterpipe smoking represents a risk to the respiratory system and is not a safer alternative than conventional cigarettes²⁵. Its use is associated with the possibility of transmitting infectious diseases through sharing the same waterpipe from user

to user, favoring the spread of diseases such as influenza and oral herpes³.

The highly successful anti-smoking campaigns and the ban on smoking in public places over the past two decades have failed the growing use of waterpipes around the world. Although users recognize the dangers of smoking, most of them do not associate them with waterpipe consumption²⁶. The marketing and promotion of these products²⁶ aim to leverage it as something safe, fun, relaxing, and as a “tasty” way to socialize with their friends¹³, a fact that justifies the majority of the sample having used the waterpipe as the first product tobacco-based.

Regarding the perception of consumption, most of the sample did not consider themselves addicted, as well as half of them reported waterpipe as a less addictive substance and low and/or equally harmful when compared to cigarettes. Despite its growing popularity, the majority of waterpipe smokers report that are unaware of the health consequences of this type of smoking or underestimate the effects²⁶. Thus, people who incorrectly perceive reduced harm from waterpipe use are significantly more likely to be or become users²⁷. It is not yet known whether the use of waterpipes creates as much dependence as cigarettes at equal levels, but unequivocal evidence is accumulating on the addictive capacity of waterpipe smoke. There are consistent results that waterpipe consumption is associated with characteristics of tobacco and nicotine dependence, similar to those associated with cigarette smoking²⁸.

In addition to the neuropharmacological aspect of nicotine-mediated dependence, behavioral studies demonstrate dependence among waterpipe smokers, represented by failed cessation attempts, self-perception of dependence, intensification of use over time, adaptation to ensure access, and drug-induced abstinence, smoking cessation supplied by subsequent use¹. Despite the risks to health associated with waterpipe use, young adults perceive waterpipe as

popular, distinctly different, low harmful and addictive, and more socially acceptable than smoking cigarettes²⁹. This information supports the data found in the present study, where a large part of individuals did not show any intention to stop using waterpipes.

The present study has some limitations. The proportion of female participants was higher and this can be explained because most of the individuals were students in the health sciences area. However, it is worth mentioning that the sample was probabilistically stratified and for the selection of participants, a sample calculation was performed. In addition, the data collected by the present study can guide the development of strategies that can modify this new scenario of tobacco consumption, since both cigarettes and waterpipe contain nicotine and combustion products¹¹ and that waterpipe contain relevant concentrations of toxic compounds compared to cigarette smoke, posing risks to individual and population health¹².

Conclusion

It is concluded that users generally had their first contact with tobacco through a waterpipe. The use of flavored tobacco was predominant in the sample, as well as the fact that young people usually share the waterpipe, especially at their friends' houses. Some of them believe that waterpipe is less or equally harmful to conventional cigarettes, which may be associated with the fact that part of the sample did not show a desire to stop using. Public health initiatives must be developed to educate the younger population about the harmful effects of waterpipe, as well as new regulations must be formulated to restrict its marketing and use. Therefore, we suggested that, as soon as campaigns are established (or isolated actions to raise awareness about the harms of waterpipes), future studies are conducted to assess their impact on the prevalence of consumption and its characteristics.

Conflict of interests

The authors declare that there is no potential conflict of interest.

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