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Young people continue to use hookah despite knowledge of possible health risks

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Abstract

Objective
Although the scientific literature show that waterpipe tobacco smoking causes irreversible damage to health, users continue to use it.

Method
This study evaluates the users' perceptions about the effect of this consumption on health. This is a qualitative study. A purposeful sample of current users was recruited. Participants were invited to undertake an in-depth semi-structured interview. The interviews were evaluated by content analysis method.

Results
Most speeches pointed out that the interviewees are aware of the harm to health from using waterpipe tobacco smoking. Although most interviewees were already developing a problematic use of tobacco, alcohol or other drugs, they rarely related waterpipe tobacco smoking with mental health consequences. The essential motivators for its continued use were the perception of control over waterpipe tobacco smoking use, the reinforcing tobacco effects, and the absence of negative health experiences in life.

Conclusion
Understand that educational campaigns and control measures should be encouraged.

Keywords: Cross-sectional studies; Hookah; Qualitative research; Tobacco.

The use of Waterpipe Tobacco Smoking (WTS) is a public health concern worldwide (Patel et al., 2019; Waziry et al., 2017).

The WTS clearly poses a severe inhalational hazard to users since they are vulnerable to inhaling toxicants transferred from the tobacco, as well as combustion-generated toxicants from the heated charcoal (Aljadani et al., 2020; Kienhuis & Talhout, 2020; Pratiti & Mukherjee, 2019; Shihadeh et al., 2015). A comprehensive systematic review revealed that 206 chemical compounds were identified in the WTS smoke (Aljadani et al., 2020). Then, the use of WTS has been associated with systemic conditions commonly related to smoking; reviews and other studies have been showing a positive association between the use of WTS and health conditions

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such as obstructive lung disease, lung cancer, malignancies of the head and neck, cardiovascular diseases, low birth weight, among others (Alves et al., 2021; Patel et al., 2019; Pratiti & Mukherjee, 2019; Waziry et al., 2017).

The fact that the users may share the apparatus also increases the risk of microbial contamination (Aljadani et al., 2020). In another systematic review of the literature, Kienhuis and Talhout (2020) suggested that this shared practice of WTS is associated with the transmission of infectious diseases, which may also develop due to poor sanitation and inadequate cleaning of hookah devices in public settings.

The increased frequency of WTS use is also associated with mental health conditions (Waziry et al., 2017). In this regard, it can serve as a gateway to cigarette use. A systematic review of the effects of WTS smoking on health suggested that among current non-cigarette smokers, WTS increases the odds of initiating cigarette smoking (Pratiti & Mukherjee, 2019). For instance, in a longitudinal study, Case et al. (2018) demonstrated that the use of WTS is a significant risk factor for the subsequent initiation of other combustible tobacco products (conventional cigarettes and cigar products) or electronic cigarettes. Thus, there is a particular concern about the possibility of progression from WTS to regular smoking and, consequently, the development of nicotine dependence, as suggested by Pratiti and Mukherjee (2019).

Despite that, it is common for most young adults to consider that WTS is less harmful and addictive than combustible cigarette smoking, with some even believing that certain additives impart health benefits (Jafaralilou et al., 2021; Karaman et al., 2022; Kuk et al., 2022; Patel et al., 2019). In a qualitative study, Griffiths and Ford (2014) revealed that WTS users perceived a low vulnerability to infection or other health problems or conditions associated with WTS. Noonan and Patrick (2013) observed that 30% of their sample considered WTS to be less harmful than cigarette use, while 60% of the sample considered hookah to have less addictive inducing power than cigarettes. However, until now, the literature does not necessarily bring about a consensus on the user's perception of the health harms related to WTS use, pointing out that WTS use is alarming, especially in the context of minimal available data about WTS demographics and health effects. In this regard, in Brazil, little is known about the use of WTS and its users, nor the reasons that lead them to continue using WTS despite its potential health consequences. Also, many Brazilian studies on its use have focused on students, disregarding the participation of young people from the general population. Thus, we intended to evaluate, using qualitative research methodology, what young WTS users from the general population know about the health effects of WTS usage and the motivation to go on this consumption. We intended to evaluate if WTS users spontaneously report information about WTS effects on mental health, especially on alcohol, tobacco and other drug use. We also measured the risk of developing alcohol, tobacco, and other drug dependence among WTS users to compare these outcomes to the perception users had about the effects of WTS use on health.

Methods

The assumptions and techniques of the qualitative research methodology were used to conduct this study. This methodology is the best alternative when a partially known (or unknown) social phenomenon is portrayed, allowing the survey of information, formulation, and proof of new hypotheses. The qualitative research methodology seeks to evaluate, interpret, understand, and describe the senses and meanings of a social phenomenon from the values, beliefs, representations, habits, attitudes, and opinions of the individual or group that holds them (Yin, 2016). In this study,

we adopted the ethnographic approach, a qualitative design aimed to describes and interprets the shared and learned patterns of values, behaviors and beliefs of a culture-sharing group; the culture-sharing group under analysis in this study was the WTS users.

Participants

The qualitative methodology uses an intentional selection of the sample, choosing subjects that have experienced the social phenomenon, whom we call "information-rich cases", instead of opting for a probabilistic sample (Víctora et al., 2000). The intentional sample is selected by criteria, which are submitted to factors that characterize the social actors of the phenomenon in question. As the present research aimed to investigate the recreational use of WTS, users of both genders, aged 18 years or older, who did not make this use a cultural custom were selected as part of the sample. The users were defined as subjects who had used hookah at least 25 times during their lives and who were active in its use in the six months before the interview, avoiding the selection of experimental or novice users who still did not have a "history" with WTS, which would generate insufficient information and beginner's bias. The first step in the sample selection was to contact key informants and gatekeepers, people who control information, physical access, and other important relations within the social phenomenon under study (Creswell & Poth, 2018). Four people were selected as key informants: three were health professionals (two doctors – a specialist in psychiatry and a specialist in pediatrics/hebiatrics – and a psychology professional), and one was a non-experimental WTS user. The participation of these people was important for the researchers to know the research field and to help develop the interview script (Creswell & Poth, 2018). The second step for the sample selection was the use of the snowball technique, in which the researcher was inserted into a network of interviewees through successive indications of the participants themselves (Vinuto, 2014); that is, a research participant identified potential participants in their social networks, who in turn, identified other people, and so on. From then on, chains of interviewees from different regions of the city of São Paulo and the ABC region of São Paulo were made, enabling the inclusion of varied profiles of interviewees, increasing the diversity of cases, and improving the understanding of the nuances of the social phenomenon. The research participants were continuously selected until the point when the theoretical saturation of the sample was reached, that is, the moment when the information became repeated, redundant, or recurrent (Víctora et al., 2000). This study reached this point with 29 participants, divided into ten chains of interviewees.

Instruments

The interviews were used as a research tool, enabling the recording of participants' verbal and nonverbal behavior (Yin, 2016). We used a semi-structured interview directed by a script of open questions, which was applied to all members of the sample; this allowed a systematization of data collection as well as the fact that the interviewees were compared among themselves regarding the answers, identifying variations in this regard (Víctora et al., 2000). The interviews were carried out face-to-face by two interviewers who are used to this type of procedure. The interviews were carried out during daytime, in places where they were used to use WTS, ranging from their own homes to public places such as bars and tobacco shops. Once the participants consented to participate, the interview was carried out. The interviews were guided by a script of open questions that allowed the researchers to describe the profile of the interviewees (gender, age, education, marital status, work situation, socioeconomic status, religion, among others) and topics related to (a) description

of WTS (age at onset of use; description of a typical WTS session; psychological effects resulting from hookah use; pattern of use of hookah; among others); (b) use of alcohol, cigarettes and other drugs; (c) user's perception of WTS, and (e) reasons for continuing to use WTS. In this manuscript, we focused the analysis on the interviewees' perception of the use of WTS.

Data Analysis

As for the form of analysis of the interviews, first, each one was assigned an alphanumeric code to safeguard the confidentiality of the participant's information, which was, in this order: (a) the initial of the name; (b) age; and (c) initial of the sex (F or M). Thus, the code A20F would mean a WTS user who is female (F), 20 years old (20), and whose name begins with the letter A. Then, each of the interviews was transcribed and printed. The information was analyzed in thematic cores through the content analysis method of Bardin, a classification and quantification screening method according to the frequency of items of meaning in statements, then allowing the classification of information into categories (Bardin, 2016). This analysis was performed according to the following stages (Franco, 2018): (a) skimming the text: it can be defined as reading the text quickly to find out what it is about and how it is organized, establishing contact with the documents to be analyzed, and getting to know the text; (b) definition of provisional hypotheses: the floating reading allowed the construction of hypotheses about the object under study; (c) determination of the Context Units (CU) and Recording Units (RU) of the text to then apply quantification rules. The CUs are fragments of the text of each interview within a given thematic core, which are individually analyzed. The CUs were abbreviated into units of shorter length, the RUs. At this stage of the analysis, the interpretation of the information was not considered. It is important to mention that, for this study, a total of 160 CUs and 215 RUs were generated; (d) categorical analysis of the text: the RUs were grouped into categories and subcategories according to their semantic meaning, in such a way as to explain the phenomenon studied empirically; (e) interpretation/presentation of the results: the researchers evaluated the frequency of occurrence of each of the categories and subcategories listed for the explanation of a given thematic core, presenting them in tables. It is important to note that every category, regardless of its frequency in a thematic core, is important for explaining the phenomenon, even if it appears in only one person's statement. Data were represented in an essentially descriptive way and illustrated with fragments of the interviewee's speeches, enhancing its richness.

Further, the respondents were invited to answer the "Alcohol, Smoking and Substance Involvement Screening Test" (ASSIST-WHO) that obtains information concerning tobacco and other drug use (marijuana, cocaine, crack-cocaine, inhalants, amphetamines, ecstasy, hallucinogens, opioids, among others) across the lifetime and over the last 3 months, and obtains information concerning drug-related problems over the last 3 months. Furthermore, the ASSIST-WHO indicates the level of risk associated with a respondent's substance use and whether their use is hazardous and likely to cause harm. The scale score for tobacco and other drugs varies as follows: (a) low-risk use (≤ 3 points), moderate-risk use (4-26) and high-risk use (≥ 27). Respondents who scored ≥ 4 were at risk of abusing tobacco and other drugs. The Alcohol Use Disorders Identification Test (AUDIT) was used to evaluate the risky use of alcohol. The scale score for alcohol varies as follows: (a) low-risk consumption (LRC) (≤ 7 points), (b) risk use (RU) (8-15), (c) harmful use (HU) (16-19) and (d) probable dependence (PD) (≥ 20). This research was approved by the Research Ethics Committee of the Centro Universitario Faculdade de Medicina do ABC (FMABC) through Process nº 3,660,548.

Results

The interviewees were young (average age = 24.6 years; range: 18-37), male (*n* = 18), single (*n* = 25), and had completed High School education (*n* = 26). Most of them had a formal employment tie (*n* = 22) and some religion at the time of the interview (*n* = 16). On the perception of health risks related to the use of WTS, the category on the recognition of the occurrence of some disease and/or health problem due to WTS was the most reported.

> (...) it certainly does not do a good thing (...) I see when the water is getting dark (...) it (the smoke) is going inside me (...) it is certainly not good, it is dense, and there are things mixed in the air (G22F).
>
> I think so because of the smoke you inhale, the carbon dioxide, and many things. It is the nicotine, the essence, and the toxic substances it has. So, I think it isn't good for you (C22M).

Among the interviewees who recognized the occurrence of some disease/health problem, the categories about the supposed event of respiratory tract diseases, infectious/contagious were the most often reported. They also reported the supposed occurrence of inflammatory diseases and nonspecific symptoms such as dizziness, headache, and increased blood pressure, among others. On the other hand, there were only a few statements relating the use of WTS to the development of mental health issues; the development of abuse/dependence on tobacco was the only category reported about the supposed mental health issues related due to WTS.

> (...) I think it can cause lung cancer depending on how much the person smokes (...), and it is also very dangerous for people with asthma (...). It can worsen these respiratory problems. Even for people who already have low blood pressure, it can lower it further. Plus, physical problems because of the smoke (G22F).
>
> (Sharing a hose) can transmit hepatitis, thrush, herpes, everything. That's where people's common sense comes in (J20F).
>
> I know people who didn't use it, and today they do it all the time. Every time I say it's like this, I'm watching a movie or a soap opera, and the hookah lights up. So I believe that there is this risk that it is addictive (L26F).
>
> (...) I don't know how to explain it; I think I got used to it (...) Nowadays, I'm going to smoke anytime; it's an addiction that I can't stand anymore. But it's not high (...), but it's a habit, addiction, all that (T20F).
>
> (...) no, there's no high, I've never felt anything myself (...) it's like playing soccer, practically the same thing, there's no high, I don't feel anything (V30M).

The participants' reports also showed that the required sharing of the hookah apparatus's hose could transmit some infectious/contagious diseases by indirect contact between the mouths. Thus, when requested to answer about the use of some preventive method to avoid this, the participants were split equally into two categories: (a) Yes and (b) No. Among those who responded yes, using a mouthpiece (a plastic piece positioned at the tip of the hose to avoid contact between mouths) was the most reported preventive method. A few respondents reported the use of a disposable hose or cleaning the hose with the hand after use by a colleague, or having their own hookah. Whatever the person's technique of choice, we noticed its use may be inconsistent since some statements showed that they do not use it with family members, friends, or others, only with strangers.

> When we go to a lounge or tobacconist, we rent them; there are disposable hoses for single use. And there is also the mouthpiece, a little thing you put on the tip (of the hose). It is plastic and disposable (E18M).

> Theoretically, it (the hose) should be individual, but when you're in a group of friends, it's kind of embarrassing, you know? It's awkward to tell your friend; it will look like you're disgusted. And even though you are really disgusted, you are ashamed to expose this to him (J20F).
>
> (...) sharing a hose is the same thing as sharing a cup. I always share glasses with my friends because I know they do not have diseases in the mouth to transmit. I just think you must share with people you know, not get in a place full of strangers and start smoking with them (E18M).

Most of the statements pointed out that the knowledge of these diseases and/or problems did happen as an assumption based on the observation of an external source (by social media, the internet, and TV, among others), not as through personal experience. But then, external information can also come from observing events that occurred with people from their immediate social environment, such as family, friends, and colleagues, among others.

> (...) the media started to show that hookah could even be more harmful than cigarettes (...). They started reporting oral problems and ulcers (...), and some even reported pulmonary problems resulting from hookah use. I did not investigate in depth (D35M).
>
> (...) when I'm walking uphill, being late and having to go fast, I feel tired (...) I am 20 years old; this should not be happening. But I cannot stop smoking; I'm already in a terrible addiction (T20F).

We asked why, even with the knowledge of health risks, the interviewees continued to use hookah. The perception of control over the use, the reinforcing effects, and the absence of negative health experiences in their lives were the important motivators for its continued use even under these conditions. Recreational reasons (making rings with the smoke), the lack of a controlling authority, and the use seen as a social norm were motivators that were less frequently mentioned among the statements.

> It can even be bad to me, but I don't see the weight of this harm. For me, it does not weigh as much as the moment of leisure. I do not see the need to give it up because it is not hindering me from doing anything in my life, in my training, in my health, in my friends (G22F).
>
> (...) ah, because it's something I like a lot. If you stop doing everything that brings you risk, you will not live, right? I think being independent is something that I like, and that does me good (R21F).
>
> (...) yes, there is no prohibition, no law (...) so, when my parents did not let me smoke, then I smoked away from them, at school, something like that. But now that my parents know and there is no law against it, I smoke until I say it's enough (J20F).
>
> Everyone knows, I know, I'm tired of researching; TV says you look for articles, you look for news. So, I'm fully aware that I'm doing much harm to myself, fully aware, but I'm accepting it because I really like hookah. But I chose this for myself; I know it's bad and all, so I'm very conscious (P34M).

Also, it is important to note that some participants showed ignorance or denial about the consequences of using WTS on health, what was reported by only a few statements.

> (...) but there are reports of people who have smoked hookah for 20, 30 years and go for an X-ray, and they have the lung of a person who never smoked in his life. So, I don't know (E18M).
>
> So, with people close to me and me, nothing has ever happened. I don't know if there are risks or everything because nothing like that ever happened to us (D26M).

Finally, on the outcomes of the ASSIST-WHO measure of tobacco use, 21 respondents reported they were not involved with cigarette smoking (5 had never tried, and 16 had only tried cigarettes in their lifetime, reporting disliking its taste or smell); only 8 respondents reported some involvement with cigarettes smoking (one occasional smoker; five regular smokers and 2 former users) (Table 1).

Table 1

Lifetime tobacco use in manufactured cigarettes and results of the ASSIST scale for risk of tobacco abuse and AUDIT scale for risk of alcohol dependence. São Paulo and ABC, 2019-2020 (n = 29)

Code	Tobacco use	ASSIST	AUDIT	Category AUDIT
P18MU	Just tried	(+)	–	–
P21MU	Regular use	(+)	(+)	27 (PD)
G21MU	Never tried	(+)	(+)	20 (PD)
V30MU	Just tried	(+)	(+)	8 (RU)
T20FU	Just tried	(+)	(+)	11 (RU)
R21FU	Just tried	(+)	(-)	4
E23MU	Just tried	(+)	(+)	24 (PD)
G22FU	Just tried	(-)	(+)	16 (HU)
E18MU	Never tried	(+)	(-)	1
Y26MU	Occasional use of cigarettes	(+)	(+)	10 (RU)
J20FU	Just tried	(+)	(+)	10 (RU)
D25FU	Just tried	(+)	(-)	3
F23MU	Just tried	(+)	(+)	10 (RU)
H18MU	Just tried	(+)	(+)	14 (RU)
R23MU	Regular ex-user	(+)	(+)	18 (RU)
C22MU	Just tried	(+)	(+)	11 (RU)
C27FU	Regular use	(+)	(+)	13 (RU)
L26FU	Never tried	(+)	(-)	2
L24FU	Just tried	(+)	(-)	5
A22FU	Never tried	(+)	(-)	5
A31FE	Just tried	(-)	(+)	17 (HU)
D26MU	Regular use	(+)	(-)	4
G22MU	Just tried	(-)	(+)	10 (RU)
L21MU	Regular use	(+)	(-)	0
P34MU	Just tried	(+)	(+)	13 (RU)
R24MU	Never tried	(-)	(-)	4
D35ME	Regular ex-user	(-)	(+)	8 (RU)
J37FE	Regular use	(+)	(-)	4
P32ME	Just tried	(-)	(-)	5

Note: (1) ASSIST: Screening test for involvement with cigarettes and other substances: the scale score for tobacco varies as follows: (a) low-risk use (≤ 3 points), moderate-risk use (4-26) and high-risk use for tobacco abuse (≥ 27); respondents who scored ≥ 4 were considered positive, that is, participants who had at least moderate risk for developing tobacco abuse; (2) AUDIT: Test to identify problems related to alcohol use, which: (a) low-risk consumption (LRC) (≤ 7 points), (b) risk use (RU) (8-15), (c) harmful use (HU) (16-19) and (d) probable dependence (PD) (≥ 20).

Among all participants, 23 respondents were already developing an abusive use of tobacco products (Table 1) (ASSIST-WHO >= 4) at the time of the interview. This means that these participants already had some issues related to tobacco use and needed some intervention. We speculate it may mainly be due to WTS use since most interviewees reported no involvement with cigarette smoking. Seventeen of the interviewees were at least abusing alcohol at the time of the interview accordingly to AUDIT criteria: (a) risky use (n = 12), (b) harmful use (n = 2) and (c) probable alcohol dependence (n= 3). Besides, five of the respondents were abusing marijuana, accordingly, to ASSIST-WHO criteria. Yet, one respondent was abusing inhalants, and a single respondent was abusing four substances (alcohol, tobacco, marijuana and inhalants) (data not shown in table).

Discussion

In this work, we identified that the profile of WTS users selected from the general population of the Metropolitan Region of São Paulo and ABC is consistent with the ones previously described, characterizing them as being male, young, highly educated, with formal employment ties, and living

predominantly in urban areas, suggesting that this profile crosses cultural and linguistic barriers (Pratiti & Mukherjee, 2019).

About the central theme of this study, our participants recognized the existence of diseases and/or health issues related to the use of WTS, having mentioned, among them, the occurrence of infectious/contagious, pulmonary, and inflammatory diseases, as well as the occurrence of nonspecific symptoms such as dizziness, and headache, increased blood pressure, among others. We also identified that the knowledge of the occurrence of diseases and/or health problems by the user of WTS was not commonly acquired through personal use or experience but through external sources conveyed by the media, among others.

In this regard, it is concerning to note that the users are aware of the health risks of using WTS. For instance, Salloum et al. (2019) pointed out that many of their participants recognized the negative health consequences of using WTS and expressed concern about sharing hoses. But other previous studies suggested that even knowing about the health risks, WTS users prefer to continue using it (Kotecha et al., 2016). Previous qualitative research revealed that young people are generally aware of the health consequences of smoking, regardless of its initiation route, but prefer to take the risk (Antin et al., 2020). It appears that no matter how much they knew about the harmful effects of hookah, it seems insufficient to prevent its use (Martins et al., 2014). Thus, this contradicts previous studies that suggested that the false impression of safety attributed to WTS is due to a lack of appropriate information about its use (Daniels & Roman, 2013); or that many young people are unaware of or have misconceptions about aspects of tobacco use in hookah recognizing the dangers associated with smoking but rarely associating them with the use of hookah (Griffiths & Ford, 2014).

On the other hand, the effects of WTS on mental health were rarely reported by our participants. Only a few users reported a supposed tobacco abuse due to WTS. In this regard, the most worrisome issue was to identify that almost all the interviewees were making risky use of tobacco products, and most were engaging in the dangerous use of alcohol at the time of the interview. Risky use of marijuana or inhalants was also identified.

So, the question is: why do WTS users deny that knowledge and continue using WTS despite its consequences on health? Kienhuis and Talhout (2020) suggested that the continued use of WTS may be a matter of hookah-related attractiveness. These authors reported that flavor is the main reason for deciding the use of WTS, besides nicotine content, price, and its socializing aspect. Also, in a study designed to evaluate the preferences of young adults concerning potential individual-level determinants of WTS, Salloum et al. (2019) pointed out that flavor accounted for 81.4% of waterpipe smoking decisions. Participating in games was also an important reason for going on WTS use, according to Salles et al. (2021). Besides WTS characteristics, we believe the decision to continue its use may be due to individual issues. In this regard, Dadipoor et al. (2019) suggested that personal issues such as having a positive attitude on WTS toward social-psychological needs and low perceived risk are among the reasons given for consuming WTS. We identified some of these reasons in our study. The lack of personal experience with health issues due to WTS seems to be an important motivator for the user to minimize the risks associated with its use, strengthening positive attitudes toward it. The issue of putting pleasure before the dangers of use, the perception of knowing how to control its use and/or its consequences, and the inconsistent use of preventive strategies to reduce the risk of infectious/contagious diseases' transmission (despite knowing that) portray altogether the low perceived risk of harm on health by smoking tobacco in a hookah. Also, most of the participants having a risky use of tobacco and/or alcohol and/or other drug use suggest that they are unaware of the harmful effects of WTS use.

Then, education campaigns about WTS hookah are always necessary, especially to increase awareness about the harmfulness of WTS on mental health. Still, the way out seems to be the change in users' behavior. Environmental changes are necessary for controlling users' attitudes and behaviors. Dadipoor et al. (2019) suggested that the ease of access and the lack of laws influence decisions to smoke a hookah. The insufficient regulations for lounges and WTS labelling and no policy for regularizing flavoring agents and charcoal used in hookahs also seem to be reasons to encourage hookah use (Pratiti & Mukherjee, 2019). In this regard, Jeihooni et al. (2018) recommended that experts and officials focus on changing attitudes towards WTS, strengthening control behaviors, enhancing efficacy in preventing WTS, and coping with temptation. Dadipoor et al. (2019) recommended that specific policies should be formulated against WTS, such as forbidding WTS in closed spaces, increasing prices, and restricting direct and indirect advertisements by mass media, the display of warnings on hookahs like those on cigarettes, among others. Kienhuis and Talhout (2020) advised including nontobacco products with or without nicotine in tobacco product regulations and smoking bans, banning the use of flavorings at any level in tobacco molasses, prescribing testing to regulate contents of waterpipe products and heating sources, encouraging research on emissions of waterpipes, prescribing warnings placed on the waterpipe device, on the menu, or the entrance of the WPS lounge, among others. Salloum et al. (2019) also suggested that limiting the use of WTS by higher pricing may effectively curb the demand for WTS among young adults. It seems that changing the environmental factors through policy changes would have the most benefit with little individual differences. In Brazil, it is worth mentioning that the measures taken to reduce smoking conventional cigarettes over the years can serve as an example of reducing or controlling WTS use. The Instituto Nacional de Câncer José Alencar Gomes da Silva pointed out that the prevalence of smoking among adults aged 18 years or older was reduced from 34.8% to 18.2% from 1986 to 2008, reaching 12.8% in 2019 (Ministério da Saúde, 2012). This policy to control cigarette use includes a ban on other smoking products, but it is unclear to what extent the legislation directly references WTS. Added to that, there is a possible poor inspection of the points of sale and consumption of WTS, which gives the impression of the absence of a control policy, as pointed out by Pratiti and Mukherjee (2019).

Conclusion

We understand that our results cannot be generalized to the entire population of WTS users. In conclusion, we believe that they can be a guide for the development of prevention strategies for young people who use (or do not yet use) WTS. Also, the results may assist in implementing policies already adopted for cigarette use. Finally, we hope that the results of our study will foster the development of new research.

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T. V. SALLES and L. G. OLIVEIRA was responsible for the project design and conceptualization, data formal analysis and data interpretation; data discussion; review and editing. A. G. ANDRADE was responsible for the data interpretation; data discussion; review and editing.