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Factors contributing to the upsurge of water-pipe tobacco smoking among Saudi females in selected Jeddah cafés and restaurants: A mixed method study

Ola A. Abdulrashid, Omar Balbaid[1], Adel Ibrahim[2], Hassan B. U. Shah[2]

Abstract:

BACKGROUND: Despite clear evidence indicating the health hazards of water tobacco smoking (WTS), there is a remarkable increase in the frequency of WTS in the Middle East and the Gulf region, particularly among young girls and women. The objective of this survey was to examine the prevalence of and the reasons for addiction to WTS and study in depth the factors contributing to the increased frequency of WTS among Saudi females.

MATERIALS AND METHODS: This study was conducted in different cafés and restaurants in Jeddah using a mixed method approach. A quantitative approach was carried out by a cross-sectional design, in which adult WTS Saudi females (n = 332) were selected from ten cafés. In addition, a qualitative approach was pursued involving five focus group discussions and three in-depth interviews of heavy smokers. Frequencies and percentages were calculated for the categorical variables, and Chi-square test and regression analysis were performed to establish association. Key themes were identified and built upon for the qualitative part.

RESULTS: The mean age of female water-pipe (WP) smokers was 32.5 ± 11.9 years. Addicted to WTS were 39.6% of the women. Significant predictors of smokers' addiction to WTS according to regression analysis ($p < 0.05$) were increased frequency of WTS, perception that it improved mood, and insistence on carrying one's own WP to restaurants and cafés. Smoking frequency increased in pleasant weather ($p = 0.025$) and better mood ($p = 0.033$). This study showed that students and working women were more addicted to WTS ($p < 0.001$). Those who smoked daily preferred to smoke at home especially when alone ($p < 0.001$), while the preferred place for those who smoked weekly was restaurants in the company of their friends ($p < 0.001$). Most of the participants in this study believed that WTS was less harmful and less addictive than cigarette smoking. The only driving force to quit WTS was the effects on their beauty/skin.

CONCLUSION: WTS is a public health problem, especially among young girls. Peer pressure, view that it is a fashion symbol, carrying one's own WP and wrong belief that WP was less harmful, improved mood, and effect of the weather are main factors leading to unintentional dependency on WTS. The only driving force to stop WTS is the effect it has on beauty/skin. It is important to understand the reasons behind the upsurge of WTS in this group for appropriate policy for intervention for its prevention and cessation.

Keywords:

Female smokers, hokkah, hooking, mo'assel, water tobacco smoking

Head of Training Center, Postgraduate Studies and Research Department, Directorate of Health Affairs for Public Health Division, [1]Trainer at Joint Program of Family and Community Medicine, [2]Research Department, Directorate of Health Affairs for Public Health Division, Jeddah, Saudi Arabia

Address for correspondence:
Dr. Ola Abdulrashid, Head of Training Center, Postgraduate Studies and Research Department, Directorate of Health Affairs for Public Health Division, P.O. Box Alsharafiah 1126, Jeddah 21431, Saudi Arabia.
E-mail: dr-olahashim@outlook.com

Introduction

Tobacco-related diseases are leading causes of preventable global deaths, the reason behind the death of one in ten adults worldwide.[1] Alarmingly, tobacco use is increasing among women and young people in several regions of the world.[2]

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The preferred method of tobacco use in this group is the water-pipe (WP) tobacco smoking water tobacco smoking (WTS) locally called as mo'assel/shisha. The habit once considered that of old men of low socioeconomic level is now gaining popularity among women and young people mostly of high socioeconomic level.[3,4] Compared to cigarette smoking, WTS is not considered a social taboo in Arab culture anymore, resulting in the smoking of WP by Arab females in the open without embarrassment or shame.[5] It is widely accepted and many restaurants and cafés in the Eastern Mediterranean Region (EMR) serve it.[5,6] The reasons for preferring this method include peer pressure, pleasant smell of the smoke, ambience in the café, and especially the perception that it is less harmful.[6,7]

Realizing the harmful health effects of smoking, the Saudi Government launched an anti-smoking campaign for the first time in 2003.[5] With the growing phenomenon of WTS in public areas, particularly in enclosed places, the Saudi Government issued the smoke-free law in 2012 that applied to indoor restaurants, coffee shops, supermarkets, and shopping malls.[5,7]

Previous studies indicated that the prevalence of WTS among Saudi females ranged from 18%–37% and highlighted it as a public health concern that required immediate attention to limit a further increase of this phenomenon.[8] The main reasons indicated for the increase WTS use in these studies were peer pressure and psychosocial factors.[8,9] The use of a mixed method study (combined quantitative and qualitative methods) will give a complete understanding of the problem and develop a complete picture,[10] important for the development of properly structured prevention and policy interventions as recommended by several health organizations.[11,12] Together with the quantitative analysis, there is a need for qualitative research to highlight the factors contributing to the increase in frequency of WTS among females, types of tobacco used, and depth and frequency of inhalation. The objective of this survey was to examine the prevalence and analyze in-depth the factors and reasons for Saudi females' addiction to WTS. It would help explain its impact on health and provide a sound basis for policy makers and programmers.

Materials and Methods

This study was conducted in Jeddah city, considered a hub for cafés and restaurants serving the WP. The participants were adult Saudi females WTS, aged 15 years and above (The selection of this age group, willing to complete the interview, was done in accordance with the WHO report on global tobacco epidemic, 2011).[1] The study adopted a mixed method design, constituting quantitative cross-sectional study to determine the factors potentiating WTS, followed by focus group discussions (FGDs) and in-depth interviews (qualitative design). The total duration of the study was 5 months, from June 1, 2014, to November 1, 2014. The sample size was calculated using Epi Info version 6.4 statistical package (Centers for Disease Control and Prevention, Atlanta, Georgia, USA). The expected proportion (*P*) was substituted by 0.22 according to the findings of Bassiony (smoking in Saudi Arabia).[8] The worst expected frequency was set at ±0.05, confidence interval of 95%, and power of (80%), and the sample size accounted for a minimum of 264 individuals. Interviews in the qualitative method stopped on reaching "stage of saturation" (when no new or relevant information emerged).

There was no clear distinction of the cafés assigned only for families; therefore, the researcher had to pursue a convenient sampling for cafés for families and restaurants that served WP. Around 14 restaurants were chosen, permission from the restaurants' management, approval from Institutional Review Board/Ethics Committee of Ministry of Health Jeddah secured, and oral consent from the participants were obtained. Four restaurants refused us permission to interview their customers.

The Arabic version of the questionnaire with slight modification was adopted from literature review (Bassiony and Lebanon WP) having internal consistency (Cronbach's alpha coefficients equal to 0.83).[8,13] As the participants were females, the researcher added questions on smoking WP during pregnancy, marital status, and permission for their children to smoke.

In the qualitative method, the participants were recruited from the WP cafés and restaurants in Jeddah through the Snowball Technique. To enroll the participants, the researcher visited the selected restaurants, approached the females smoking WP, and after explaining the purpose of study, requested them to invite their friends to the same place for FGDs. The researcher obtained oral consent from each participant and assured them of the confidentiality of data. Some of the participants refused to have a voice recording, so notes were taken instead. Each FGD involved 5–6 participants, usually friends of the same age group. The aim of this was to allow the females to freely discuss their attitudes and perception of WTS without any embarrassment. FGD was organized as a semi-structured interview with a set of predetermined open-ended questions, encouraging new themes that would emerge from the dialog between the researcher and the participants. Each session took 60–90 min, stopped when saturation was reached, i.e., no new themes were being generated from the discussions. In-depth interviews were conducted with heavy WP smokers (daily smokers), mainly aimed at delving deeply

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to understand their WTS experiences. Each session of the in-depth interview took 30–40 min and stopped when saturation was reached.

Data entry and statistical analyses were done using SPSS (version 16.0, SPSS for Windows, Chicago, USA). Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables while mean and standard deviation were used for quantitative variables after ensuring normality of the distribution. Chi-square test was used to establish the association for categorical variables. Binary logistic regression was used to find out factors predicting binomial outcome, namely tendency to be addicted to WTS. Since the WP is not as portable and accessible as cigarettes, its users may engage in more intensive behavioral adaptations to ensure access, such as relating it to mood and weather, carrying one's own WP to places, and selecting cafés based on the availability of WP. Similarly, smokers' perception of smoking more than before and being addicted to it (categorized as daily, weekly, and monthly smoker) was considered as a factor related to dependence on WP.[6,7]

Key themes were identified and built upon for the qualitative part. It is a process of coding qualitative data using a list of themes or patterns found in the transcripts, ranging from a simple description of observation to an interpretation of the phenomenon.

Results

A total of 332 adult WTS Saudi females, with a mean age of 32.5 ± 11.9 years, visiting Jeddah restaurants and cafés completed the questionnaire. Most (57%) were highly educated, slightly <one-half (42.1%) were employed, and around one-quarter (24.3%) were students [Table 1]. The mean age at which they started smoking WP was 24.8 ± 8.2 years. The majority of the study participants were either single (36%) or married (44%). Around 39.6% of the women were addicted to WTS [Table 1].

The results demonstrate that an overwhelming majority n = 309 (93%) used mo'assel and almost two-thirds n = 196 (59.0%) consumed one head per session. Of the total, only 17.1% (n = 57) were concurrently cigarette smokers. It was noted that the older women were more likely to smoke daily [Figure 1]; the frequency ranged from 12.5% of the women aged 16–20 years to about two-thirds of the smokers aged 41 + years. This increase was statistically significant, $p < 0.05$ (Chi-square). The frequency of daily smoking was found to be significantly higher among married and widowed than with single and divorced women. Furthermore, the students were the least to smoke daily [Figure 2].

Table 1: Demographic characteristics of the study participants (n=332)

Demographic characteristics	*N* (%)
Age groups (years)	
16-20	58 (17.6)
21-25	61 (17.7)
26-30	43 (13.4)
31-35	40 (11.9)
36-40	33 (9.8)
41-45	40 (11.9)
46-50	16 (4.8)
>50	41 (12.8)
Range	16-63
Mean±SD	32.5±11.9
Educational level	
Primary	8 (2.4)
Middle school	21 (6.3)
High school	115 (34.6)
University	188 (56.6)
Marital status	
Single	121 (36.4)
Married	146 (44.1)
Divorced	43 (12.9)
Widowed	22 (6.6)
Occupation	
Student	81 (24.3)
Employee	139 (41.8)
Homemaker	89 (26.8)
Unemployed or retired	23 (6.9)

SD=Standard deviation

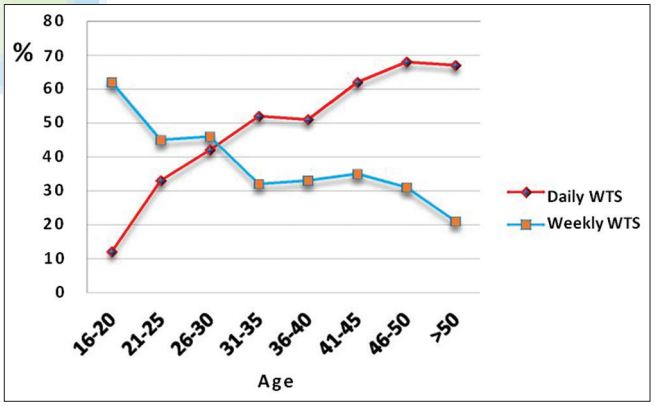


Figure 1: Frequency distribution of Water tobacco smoking by age

Those who smoked daily used significantly more heads per session ($P < 0.001$); the frequency of their smoking increased when the weather was pleasant, which related to their mood and WTS [Table 2]. This study showed that students and working women were more addicted to WTS ($p < 0.001$). Those who smoked daily preferred to smoke at home especially when they were alone ($p < 0.001$) while the preferred place for those who smoked weekly was restaurants in the company of friends ($p < 0.001$).

Table 3 demonstrates the model of the regression analysis for the factors that predict addiction of smokers to WTS.

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The results showed that increased frequency (sessions) of WTS, perception that WTS improved mood, and insistence on taking one's own WP to restaurants and cafés were the most significant predictors addiction to WTS, $p < 0.05$. It was evident that those who smoked daily were almost three times (odds ratio; 2.8) as likely to be addicted than those who smoked weekly.

Table 2: Factors related to addiction to water tobacco smoking

	Daily *N* (%)	Weekly *N* (%)	Monthly *N* (%)	*p*-Value
WTS increased with pleasant weather				
Yes	137 (92.6)	128 (94.1)	40 (83.3)	<0.025
No	11 (7.4)	8 (5.8)	8 (16.6)	
WTS affected by mood				
Yes	84 (56.7)	72 (52.9)	18 (37.5)	<0.033
No	29 (19.6)	23 (16.9)	18 (37.5)	
Sometime	35 (23.6)	41 (30.1)	12 (25.0)	
WTS improves mood				
Yes	73 (49.3)	56 (41.1)	16 (33.3)	<0.006
No	28 (18.9)	22 (16.1)	19 (39.6)	
Sometime	47 (31.7)	58 (42.6)	13 (27.0)	
Choosing café depends on WTS				
Yes	115 (77.7)	111 (81.6)	28 (58.3)	<0.003
No	33 (22.3)	25 (18.3)	20 (41.6)	
Carry WTS along				
Yes	86 (58.1)	34 (25.0)	7 (14.6)	<0.001
No	62 (41.9)	102 (75.0)	41 (85.4)	
Smoking now more than before				
Yes	137 (92.6)	108 (79.4)	30 (62.5)	<0.001
No	11 (7.4)	28 (20.5)	18 (37.5)	
Addicted to WTS				
Yes	87 (58.8)	41 (30.1)	4 (8.3)	<0.001
No	61 (41.2)	95 (69.8)	44 (91.6)	

WTS=Water tobacco smoking

A total of 32 participants in the FGD and in-depth interviews were recruited by the snowball method. The participants of the in-depth interview were the regular (daily) and heavy (more than three WP per day) smokers.

The main categories and themes identified in the FDGs and interviews are given in Table 4 and details are provided in the following text.

Factors influencing/contributing to water tobacco smoking use

Motivations for water tobacco smoking

The reasons identified for the increase in WTS use include entertainment, having a good time with peers, especially in pleasant weather and different festive occasions. The main reason for starting WTS included peer company and imitation of friends and celebrities (66.7%). One participant commented:

"… I started WTS as result of my friends; all of them smoke when we get together. After smoking a few times, I got into the habit."

Mood is another trigger for the women to crave WTS. The misconception that it could counter stress and provide a

Table 3: Factors predicting addiction to water tobacco smoking

Factors	*B*	SE	Wald	df	*p*-Value	OR (95% CI)
WTS frequency	1.047	0.215	23.622	1	<0.001	2.848 (1.08-5.60)
WTS improves mood	0.451	0.168	7.213	1	0.007	1.57 (0.49-0.87)
Carry WP along	1.129	0.275	16.904	1	<0.001	3.092 (1.69-8.64)
Constant	−5.193	0.705	54.217	1	<0.001	0.006

SE=Standard error, OR=Odds ratio, CI=Confidence interval, WTS=Water tobacco smoking, WP=Water pipe

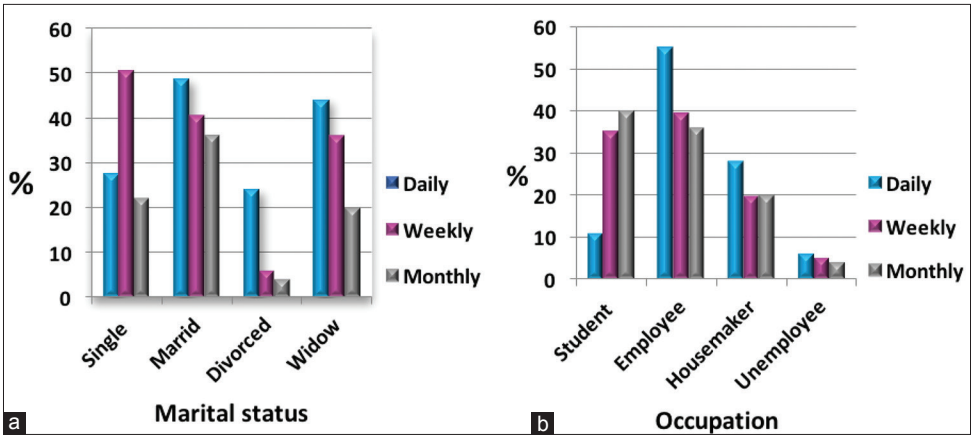


Figure 2: Water tobacco smoking (a) frequency and marital status (b) frequency and occupation

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Table 4: Categories and key themes of qualitative analysis

Category 1: Factors influencing/contributing in WTS use
Key themes
Motivation
Sensory characters
Socio-cultural norms
Parents and other family members
Frequency and availability
Category 2: Health beliefs about WTS
Key themes
Health effects of WTS
Advantages and disadvantages of WTS
Beauty concerns

WTS=Water tobacco smoking

false sense of feeling relaxed increases WTS use as one respondent said:

"… Smoking WP gives a great feeling, relieves my tensions and helps me to relax. I just want to smoke in a quiet environment and enjoy my WTS session."

Sensory characteristics of water-pipe

Around (100%) participants were attracted to the smell and taste of the fruity mo'assel, which is available in different attractive flavors such as cappuccino, bubble gum, cheesecake, and many more.

"… I tried many flavors of mo'assel. it's nice to try different flavors every time."

Most of the participants agreed that the smell of smoke pleased and relaxed them. The more smoke they exhaled, the happier they felt (91.7%).

"… I get annoyed if the smoke is little. I want it to be dense, so I like more coal at the head of the WP".

Sociocultural norms

Smoking WT by a woman, especially in the restaurants, was not acceptable in this reserved culture a few years ago. However, of late, the stigmatization relating to WTS has disappeared and Saudi females now smoke freely without any feeling of shame. Most of the participants were of the opinion that WTS was not forbidden by religion, so they had no guilt smoking WP (79.2%).

Parents and other family members

Many young participants go to cafés and restaurants to smoke WP without their parents' knowledge and permission as one participant told us:

"… My parents don't know that I smoke; I usually go with my friends to cafés after sneaking away from college."

Even though stigmatization of WTS has minimized as a whole in our culture, parents fear that if their daughters use WTS, getting a good spouse for them would be difficult.

With regard to married women, it is necessary to get the permission of their spouses for them smoke WP. Smoking without a spouse's knowledge is sometimes the reason for marital problems. As one participant stated:

"My husband doesn't allow me to smoke WP although he himself is a smoker. Actually, he doesn't like the image of women smoking WP."

The image of females smoking cigarettes and young girls smoking WP is not acceptable even among the women who use WT.

Frequency and availability

Most of the participants in the FGD and interviews were students and women in employment. The preferred time for the working women to smoke WP was early in the morning before work and late at night after completing their daily chores.

"… I prepare my WP at night, so that after Al-Fajr prayers I have time to smoke one head of mo'assel." "After I return from my work my maid would have already prepared my WP, so I smoke before I have a nap."

"… My friends and I schedule our lectures at the beginning of the study semester, so they fit in with the time when restaurants serve WP in the morning."

The frequency of WTS varies among the participants, but the daily (heavy) smokers can use as many as seven or eight heads per day. The participants showed that they were so obsessed with WTS that they could go without food, abandon their work, or even social gathering just to smoke WP.

Health believes about water tobacco smoking

Health effects of water tobacco smoking

Even though most participants of the FGD and in-depth interviews knew that WTS was harmful and could cause fatal diseases, they still indulged in it.

"… My mother died from smoking-related disease. She was a heavy smoker, but it doesn't matter; as I enjoy WTS."

Advantages and disadvantages of water tobacco smoking

From the perspective of the participants, WTS helps one to relax, increases concentration, and decreases appetite. WT smokers have the misconception that it is better and less harmful than cigarette smoking. They think

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that it is hygienic as it does not cause bad mouth odor and does not leave a smell on the hands and clothes. Moreover, since it is not easily accessible at all times such as in the car or when walking, it is less used. Another misperception is that the water in bowl filters the nicotine making it less harmful than cigarettes.

Beauty concerns

The only thing which some of the participants were concerned about was the effect of smoking on their beauty. They were afraid of an increase in wrinkles on the face, especially around the mouth, and the effect on the color of their teeth.

"… I am a heavy WP smoker, I smoke 5–8 heads per day, but of late I have been trying to reduce WTS because of the discoloration of my teeth and some shortness of breath."

Discussion

Worldwide, WTS by women has become a public health issue. In this study, we used the mixed method technique to better understand increased WTS trends. Quantitative methods were used to determine the factors behind it, and the qualitative approach to give more in-depth understanding of this social phenomenon.

The influence of religion and the conservative society should have made the prevalence of WTS lower in EMR than other countries. However, reports indicate an increase in WTS consumption.[14,15] Quantitative part of the current study highlights an increase in the WTS use when the weather is good. The women are in a good mood and want to enjoy the company of their friends. Similar findings have been recorded in Lebanese and other Arab populations.[13,14] Choosing cafés that serve WP or bringing their own WP increase the likelihood of WTS consumption. This was also seen in the population of studies conducted by Dar-Odeh *et al*.[14] and Khalil *et al*.[16]

The qualitative part highlighting factors that increase WP use includes encouragement by seeing successful and highly educated females use it, perception of smoking in public as a status or a fashion symbol, enjoyment of the weather and company, enjoyment of the different flavors, means of entertainment/enjoyment, and smoking as a means of rebelling against parent's opposition. Similar findings were highlighted in studies conducted by Khalil *et al*.[16] Nakkash *et al*.[17] and Mandil *et al*.[18] However, the most important reason was peer pressure, which was also seen in different studies conducted in Egypt, Sharjah, and India.[11,19-22]

Parents who themselves smoke were not in favor of their children indulging in this habit.[16,17,23] As explained by the outcome of the FGDs, parents often oppose and discourage the use of WTS, especially in unmarried girls, believing that it may ruin their reputation and decrease their marriage prospects.

The misconception of WTS being less harmful and better than cigarettes because of the fallacy that water filters nicotine and other toxins is unintentionally increasing its dependency. This point was raised and discussed in our FGDs. In contrast to studies conducted in Egypt[24] and USA,[25] where around 74% thought cigarette to be more dangerous, most of our participants knew that WTS is as harmful as cigarette to health but was not strong enough reason to stop it.

Feeling of pleasure and being relaxed with the all tension released are other contributory factors that lead to dependency. Studies conducted in Lebanon, Saudi Arabia, and Syria have also recognized the dependency of WP smokers.[5,13,17,23] The present study also shows trends of increased dependency on WTS. Studies show that the important steps toward dependence include choosing restaurants and cafés that provide WP, taking one's own WP when going out, desire to smoke as soon as they wake up and high frequency (number of heads) per day.[25,26] Age is also a factor of dependency. The students were mostly occasional smokers (weekly and monthly) while the older women were generally regular (daily) smokers.[27,28]

What can encourage them to quit WTS are either the deleterious effect of the smoke on their skin and face and the discoloration of their teeth or the hazard it poses to their children. That is why they usually discourage their children from smoking. Similar findings were seen in a study conducted in Dammam.[27] Some Lebanese women consider WTS to be attractive and that it attracts men's attention.[13] The participants of our study had contrary views on this. They did not think that smoking attracted men, but that women tended to lose their femininity with smoking.

One limitation of our study was the sampling in the quantitative method, which provided a convenience sample because of the unavailability of the list of WTS restaurants and cafés from Jeddah Municipality.

Conclusion

WTS among Saudi young girls/women is spreading fast threatening the health of this group, making it a public health concern. Peer pressure, perception of it as a fashion symbol, carrying one's own WP, and the wrong belief that WP was less harmful, improved mood, and effect of the weather are main factors that lead to unintentional dependency/addiction to WTS.

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Understanding these factors behind the upsurge of WTS can encourage appropriate prevention/cessation programs. In this way, we can protect our new generation from the dangers of WTS. Health education through multisectorial institutions (e.g., Ministry of Health, Ministry of Education, Jeddah Municipal) can improve knowledge, change attitudes, and correct the misconceptions on the habit of WTS, especially in vulnerable groups.

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Conflicts of interest
There are no conflicts of interest.

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