

Multiple tobacco use among young adult waterpipe smokers in Egypt

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Abstract

Background: The use of multiple tobacco products is an emerging trend. Studies on multiple use among waterpipe smokers are limited.

Objectives: We aimed to estimate the proportion of other tobacco products used by current adult waterpipe smokers in Egypt and identify the determinants of multiple tobacco product use.

Methods: Population-based surveys were conducted using interview questionnaires during 2015–2017 in urban Cairo and rural Menoufia. Participants aged 18 years and older were selected using purposive quota non-random sampling. The total sample included 2 014 participants. We analysed the data on 1 490 current waterpipe smokers. Variables recorded included: tobacco use, health beliefs, waterpipe smoking behaviour, sociodemographic characteristics, and perceived effectiveness of pictorial health warnings on waterpipe tobacco packs. Current waterpipe smokers were classified as waterpipe-only users and multiple tobacco product users.

Results: Almost half (47.9%) of the current waterpipe smokers used multiple tobacco products; 93.4% were dual users and 6.6% poly-users. The other tobacco products used were cigarettes (86.4%), electronic nicotine delivery systems (ENDS) (7.0%) or both (6.6%). Multiple users were more likely to be younger than waterpipe-only users. Young adult female waterpipe smokers used ENDS 12 times more than young adult males (48.8% versus 4.1% respectively). Non-daily waterpipe smoking, usually smoking at cafes, higher education and knowledge of pictorial health warnings were independent predictors of multiple tobacco product use.

Conclusion: Multiple tobacco product use was common among current waterpipe smokers in our study. Interventions to tackle non-cigarette and multiple tobacco use, especially in young adults, are urgently needed.

Keywords: waterpipe;tobacco; multiple use; young adults; e-cigarettes/ electronic nicotine delivery systems

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Introduction

Tobacco use is a risk factor of the main noncommunicable diseases that cause 80% of premature global mortality (1,2). Most of the world's smokers live in low- and middle-income countries, and 80% of the projected 8 million annual tobacco-related deaths by 2030 will occur in these countries (3). Therefore, tobacco control is one of the sustainable development goals for prevention and control of the noncommunicable diseases (4).

In the past few years, a trend in multiple or concurrent use of tobacco products has emerged (5–13). Growing evidence on the health hazards of the use of non-cigarette or other tobacco products has been reported (14–16). In Egypt, treatment of tobacco-related diseases costs US\$ 616 million annually, while 170 000 deaths attributable to tobacco occur each year (17). The use of multiple tobacco products may increase this health and economic burden, and prevent the achievement of the global target of a 30% relative reduction in tobacco use by 2025 (2).

The reported rates of multiple tobacco product use are high. A large national study in the United States of

America (USA) found that 40% of both adult and youth tobacco users used multiple tobacco products, mostly combining cigarettes and e-cigarettes (10). However, cigarette smoking is not always included in multiple tobacco use combinations (12). Waterpipe tobacco smoking, smokeless tobacco and electronic nicotine delivery systems (ENDS) are increasingly used worldwide (5,7,8,12,13,18,19), and have been promoted as less harmful alternatives to cigarettes (20,21). Young people who use multiple tobacco products are more prone to nicotine dependence and to continue using tobacco as adults (22). In the USA, about half of young current tobacco product users used 2 or more tobacco products (23). In the Eastern Mediterranean region, adolescents used other tobacco products (mainly waterpipe) more frequently than cigarettes (24). However, other tobacco products are not all regulated by national tobacco control laws (25).

Egypt has one of the highest rates of tobacco use in the Eastern Mediterranean region (26). Nearly half of Egyptian men currently smoke cigarettes or other tobacco products – most of them smoke daily – compared with 0.2% of women (27). Young adult males use tobacco in

similarly high proportion (40.5%) (27). Tobacco smoking is projected to increase to 62.9% among men in Egypt by 2025 (28). Also, young women in Egypt are using tobacco more, particularly non-cigarette tobacco products (29). In the 2005 and 2009 Global Youth and Global Adult Tobacco Surveys, Egyptian adolescent girls were 11 times more likely to smoke waterpipe tobacco than adult women and reported a higher prevalence of overall use of any tobacco product (3.8%) than older females (0.3%) (29). Studies determining the magnitude of multiple use of tobacco products among waterpipe smokers are limited. The aim of our study therefore was to estimate the proportion of other tobacco use among adult waterpipe smokers in Egypt, and to identify the factors associated with the use of multiple tobacco products.

Methods

Data for this study were collected as part of a larger study on the effectiveness of pictorial health warnings on waterpipe tobacco packs in encouraging cessation and preventing initiation of waterpipe tobacco smoking in Egypt.

Study design and sample

The larger study consisted of 2 cross-sectional, population-based surveys conducted in July–November 2015 and September 2016–January 2017. The target sample included 1 025 individuals in each survey period and consisted of male and female waterpipe smokers and nonsmokers aged 18 years and older from urban Cairo and a rural village in Menoufia governorate. Participants were selected using a purposive quota non-random sampling scheme. Trained field interviewers approached individuals at cafes, homes, workplaces and universities. Researches explained the purpose of the study before they screened individuals for age eligibility. Individuals who agreed to participate in the study provided their voluntary informed verbal consent to respond to a 25-minute face-to-face interview questionnaire. Participants were assigned an identification number for anonymity and to ensure confidentiality of their data. The total targeted sample in the 2 surveys of the parent study was 2 050 and the final sample included 2 014 participants (response rate 98.2%); of these, 1 490 (73.9%) were current waterpipe smokers.

Data collected

In this study, we analysed a subset of data from the larger study that focused on the current waterpipe smokers. Data included were respondents': tobacco use, sociodemographic characteristics, exposure to household second-hand smoke, health beliefs about waterpipe tobacco smoking, waterpipe smoking behaviour, and perceived effectiveness of pictorial health warnings on waterpipe tobacco packs.

For tobacco use, we considered 3 types of tobacco products: waterpipe, cigarettes, and electronic nicotine delivery systems (ENDS) – e-shisha or e-cigarettes. Respondents were defined as current smokers if they had

used any of the 3 tobacco products in the past 30 days (30); otherwise they were considered a nonsmoker (Figure 1). The main outcome studied was the sole use of waterpipe tobacco or the use of waterpipe tobacco in combination with other tobacco products. We defined a waterpipe-only user as a participant who currently smoked waterpipe tobacco only and did not concurrently use any other tobacco product. A multiple user was defined as a participant who currently smoked waterpipe tobacco as well as one or more other tobacco product – cigarettes or ENDS (dual user), or both (poly-user). The frequency of waterpipe tobacco smoking was measured as daily, weekly or monthly; cigarette smoking as daily or non-daily; and ENDS smoking as any use. Data on duration of use were available only for waterpipe tobacco smoking.

Sociodemographic data collected were: age, gender, residence (urban/rural), marital status, educational attainment and occupation. Data were also collected on participants' household exposure to second-hand smoke from cigarettes or waterpipe or both, and their beliefs about the effect of waterpipe tobacco smoking on health – whether they considered waterpipe smoking and the nicotine content of waterpipe tobacco were less, more, or equally hazardous compared with cigarette smoking and cigarette tobacco. To assess the waterpipe smoking behaviour of the participants, data were collected on: age at starting smoking waterpipes, preferred type of waterpipe tobacco (plain, flavoured), usual place to smoke waterpipes, average daily spending on waterpipe smoking, and previous attempts to stop smoking waterpipes. To evaluate the effectiveness of pictorial health warnings on waterpipe tobacco packs, data were collected on knowledge of pictorial health warnings on waterpipe tobacco packs, discussion of pictorial health warnings with others, and change induced in waterpipe smoking behaviour – e.g. smoked fewer *hagar* (portion of tobacco), had foregone a smoke, was more likely to consider quitting waterpipe smoking.

Statistical analysis

We described the sociodemographic characteristics of the participants and the proportions of tobacco users in the total sample ($n = 2\ 014$) and in the subset of 1 490 current waterpipe smokers. We categorized current waterpipe smokers into waterpipe-only users and multiple users and compared them according to sociodemographic characteristics using the chi-squared test for categorical variables. A P -value < 0.05 was considered statistically significant. The frequency of both waterpipe and cigarette smoking was further analysed as daily and non-daily use. Data on the frequency of ENDS use were insufficient; therefore the amount consumed was reported only for multiple users who were using both waterpipes and cigarettes.

Univariate analysis was used to identify variables associated with multiple tobacco product use among current waterpipe smokers. Variables that were statistically significantly associated with multiple use in the univariate analysis were included in a multivariable

logistic regression analysis. Adjusted odds ratios (OR_a) and 95% confidence intervals (CI) are reported. Variables included were gender, age, educational attainment, marital status, household exposure to second-hand smoke, frequency of waterpipe smoking, age at starting waterpipe smoking, place to smoke waterpipes, beliefs about the health effects of waterpipe smoking, knowledge of pictorial health warnings on waterpipe tobacco packs, discussion of pictorial health warnings with others, and effect of pictorial health warnings on participants' waterpipe smoking behaviour.

Data were analysed using the SPSS, version 22.

Ethical considerations

The study was approved by the Ethical Review Board of the Faculty of Medicine, Ain Shams University, Cairo, Egypt.

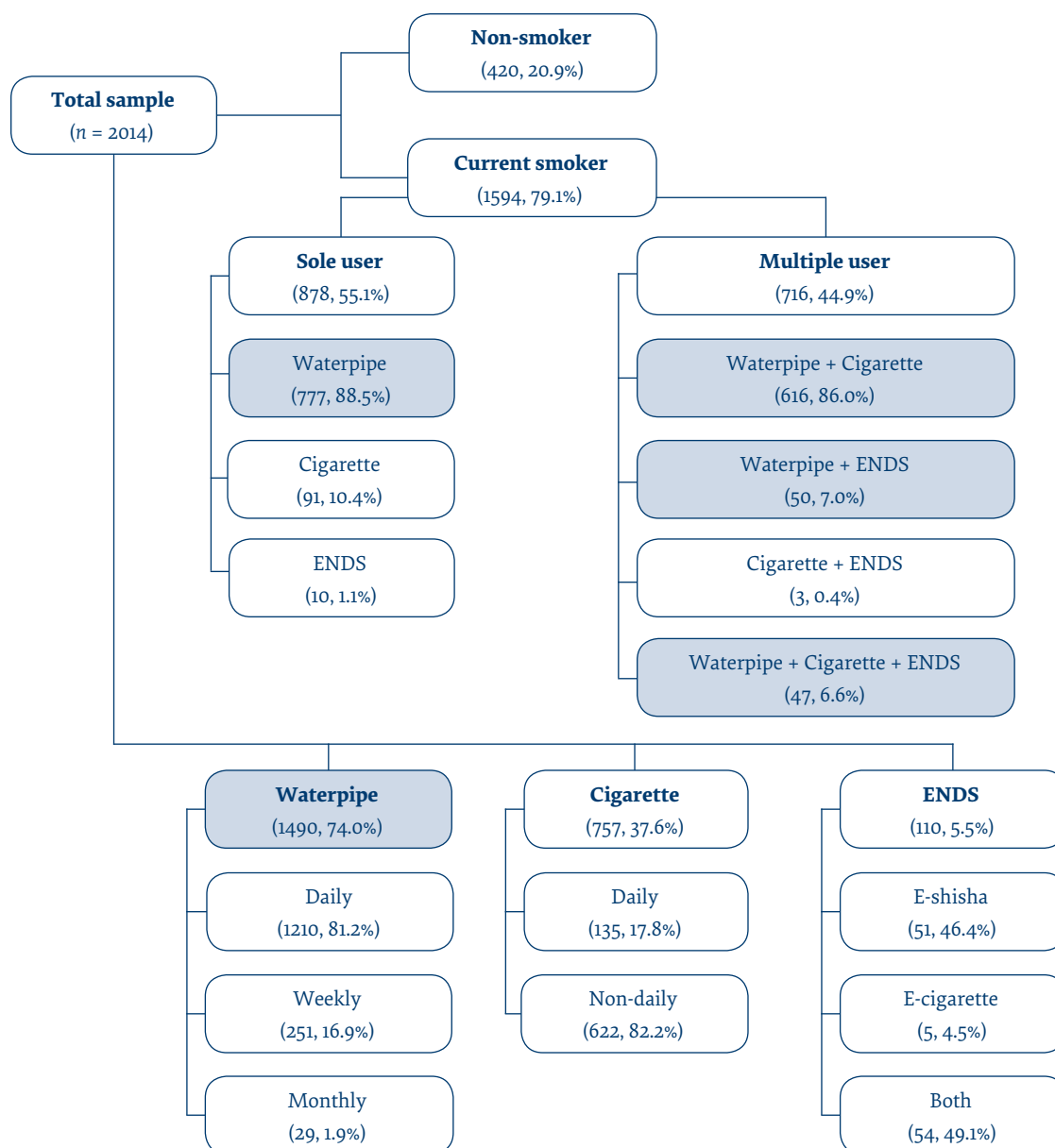
Results

Tobacco use in the total sample

More than three-quarters (79.1%) of our total sample ($n = 2\ 014$) currently used a tobacco product; waterpipe tobacco (74.0%), cigarettes (37.6%) or ENDS (5.5%) – as sole use (55.1%) or in combination with other tobacco products (44.9%) (Figure 1). As we intended to recruit an equal number of waterpipe smokers by age group, gender, and rural/urban residence, the distribution of waterpipe smokers in the total sample did not vary significantly between these demographic groups.

Cigarettes were significantly more likely to be used by younger adults (43.6% versus 34.1% by older adults, $P < 0.001$), males (38.5% versus 29.4% by females, $P = 0.013$), and those living in rural areas (43.1% versus 29.5% in urban areas, $P < 0.001$). Of the total smokers, female participants

Figure 1 Current tobacco use among study participants showing total, sole and multiple tobacco product use – waterpipes, cigarettes and electronic nicotine delivery systems (ENDS)



reported using ENDS 9 times more than males (27.8% versus 3.1% respectively, $P < 0.001$). Of the waterpipe smokers, females reported using ENDS 12 times more than males (40.3% versus 3.3% respectively, $P < 0.001$).

Tobacco use among current waterpipe smokers (n = 1 490)

Almost half ($n = 713$, 47.9%) of the 1 490 current waterpipe smokers were multiple tobacco product users. Of the multiple users, 666 (93.4%) were dual users; only 47 (6.6%) were poly-users. Cigarettes were the main tobacco product of the other tobacco products used by multiple users (616, 86.4%) while the rest of the multiple users smoked ENDS (50, 7.0%) or both cigarettes and ENDS (47, 6.6%) (Figure 1, blue shaded boxes).

Multiple users were significantly more likely to be younger than waterpipe-only users ($P < 0.001$). Among females, the use of multiple tobacco products was significantly more common than waterpipe-only use (60.4% versus 39.5% respectively) ($P = 0.003$) (Figure 2). Moreover, just over half of the younger adult females who smoked waterpipes reported using ENDS as the other tobacco product (51.2%), compared with 36.0% in the older female age group, and 4.1% and 2.9% respectively in their male counterparts.

Table 1 shows the demographic characteristics and household exposure to smoking of the total sample ($n = 2\ 014$) and current waterpipe smokers ($n = 1\ 490$) categorized as users of the waterpipe only and users of multiple tobacco products. Significantly more multiple users had secondary or higher education than waterpipe-only users, and were unmarried ($P < 0.001$). No statistically significant differences were found between waterpipe-only users and multiple users for occupation or rural/urban residence. More than two thirds (1 009/1 490, 67.7%) of all waterpipe smokers reported exposure to second-hand smoke at home. This exposure was significantly higher among multiple users than waterpipe-only users (71.2% versus 64.5% respectively, $P = 0.006$).

Waterpipe tobacco smoking behaviour and health beliefs

Table 2 shows the behaviour and health beliefs of waterpipe-only users compared with multiple tobacco product users. Significantly more waterpipe-only smokers were daily smokers, while more multiple users were non-daily waterpipe smokers ($P < 0.001$). Among multiple users, significantly more females were non-daily waterpipe smokers (70.5% versus 29.5% daily smokers) than males (19.5% versus 80.5% daily smokers) ($P < 0.001$).

Figure 2 Sole use of waterpipe tobacco and type of other tobacco product used among waterpipe smokers by gender and age-group (WTS: waterpipe tobacco smoking; ENDS: electronic nicotine delivery systems)

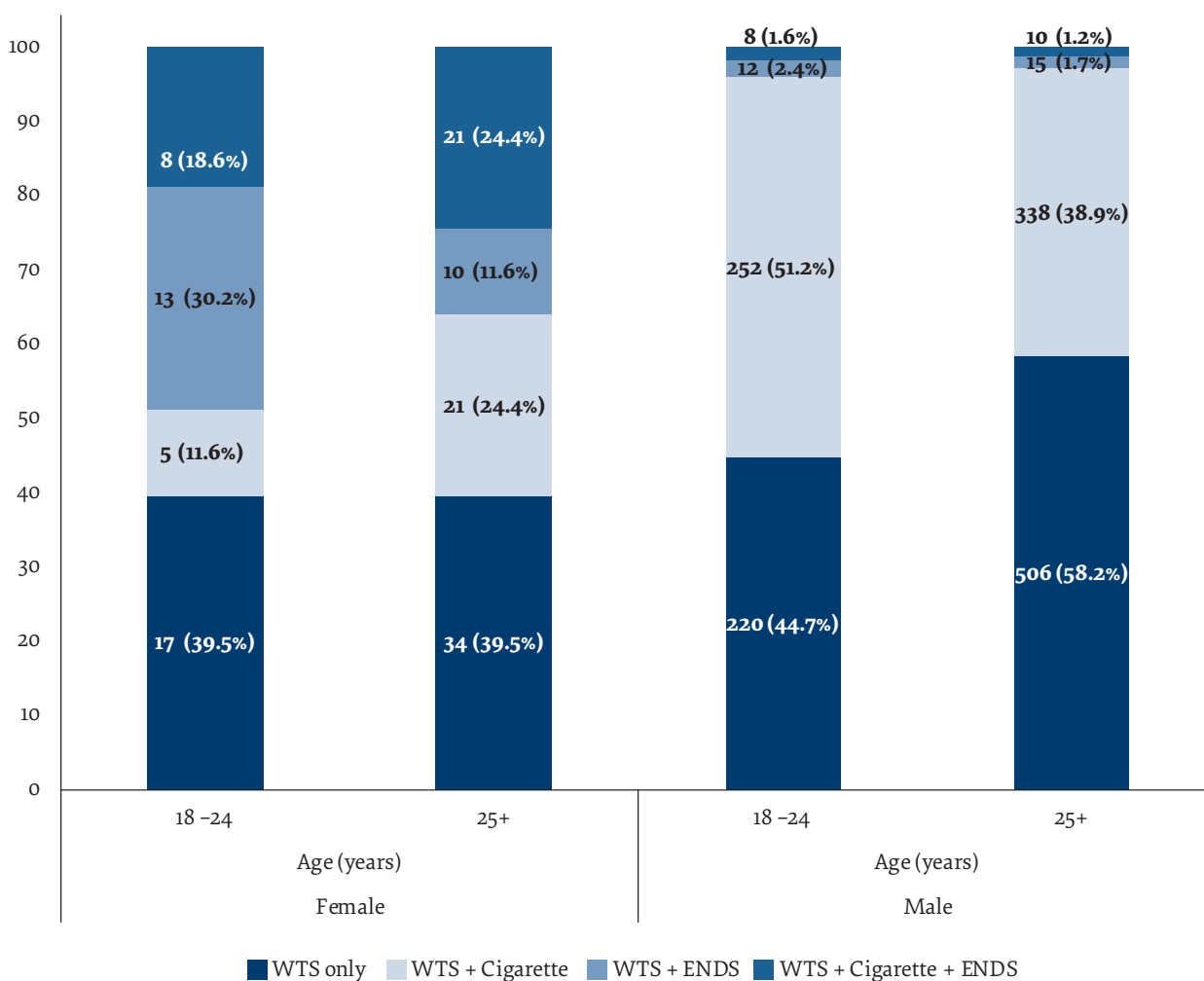


Table 1 Demographic characteristics and household exposure to smoking of the total sample (n = 2 014) and current waterpipe smokers (n = 1 490) with comparison between users of the waterpipe only and users of multiple tobacco products, Egypt, 2015–2017

Characteristic	Total sample (n = 2 014)	Current waterpipe smokers		P-value ^a
		Waterpipe-only user (n = 777)	Multiple tobacco product user (n = 713)	
	No. (%)	No. (%)	No. (%)	
Age group (years)				
18–24	743 (36.9)	237 (30.5)	298 (41.8)	< 0.001
25+	1271 (63.1)	540 (69.5)	415 (58.2)	
Gender				
Male	1820 (90.4)	726 (93.4)	635 (89.1)	0.003
Female	194 (9.6)	51 (6.6)	78 (10.9)	
Residence				
Rural	1194 (59.3)	442 (56.9)	441 (61.9)	0.051
Urban	820 (40.7)	335 (43.1)	272 (38.1)	
Education				
No schooling	90 (4.5)	53 (6.8)	22 (3.1)	< 0.001
Primary	139 (6.9)	82 (10.6)	36 (5.0)	
Preparatory	163 (8.1)	91 (11.7)	48 (6.7)	
Secondary	679 (33.7)	248 (31.9)	306 (42.9)	
Vocational/university	943 (46.8)	303 (39.0)	301 (42.2)	
Occupation^b				
Professional	314 (15.6)	95 (12.2)	94 (13.2)	0.928
Technicians and associate professionals	203 (10.1)	69 (8.9)	65 (9.1)	
Skilled	838 (41.6)	371 (47.7)	328 (46.0)	
Elementary occupations (e.g. porters, door keepers)	189 (9.4)	84 (10.8)	73 (10.2)	
Student/unemployed	470 (23.3)	158 (20.3)	153 (21.5)	
Marital status				
Unmarried	743 (36.9)	233 (30.0)	294 (41.2)	< 0.001
Married	1271 (63.1)	544 (70.0)	419 (58.8)	
Someone at home smokes				
Yes	1272 (63.2)	501 (64.5)	508 (71.2)	0.006
Waterpipe	212 (16.7)	92 (18.4)	68 (13.4)	0.151
Cigarettes	344 (27.0)	96 (19.1)	127 (25.0)	0.004
Both	716 (56.3)	313 (62.5)	313 (61.6)	0.172

^aComparison between users of the waterpipe only and users of multiple tobacco products.

^bAdapted from the International Standard Classification of Occupations (<http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm>)

More multiple users started smoking waterpipes at an older age than waterpipe-only users ($P < 0.001$). More females started smoking waterpipes at 18 years or older compared with males (88.5% versus 53.5% respectively) ($P < 0.001$). Significantly more multiple users, especially young adults ($P = 0.018$) and females ($P < 0.001$), smoked waterpipes at cafes, while waterpipe-only users smoked at home and in cafes alike (Table 2). Females spent 4 times as much on waterpipe tobacco smoking than males – median daily spending = 16 EGP (interquartile range 10–30 EGP) for females compared with 4 EGP for males (interquartile range 3–10 EGP). Young adult females were significantly more likely to smoke flavoured waterpipe tobacco (76.7%) than older females (65.1%) and their male counterparts (12.4%) ($P < 0.001$ for both).

The majority of waterpipe-only and multiple users (60.4% and 65.1% respectively) believed that waterpipe smoking was bad for health but only about one-fifth of both waterpipe-only users (20.1%) and multiple users (19.1%) ever tried to quit (Table 2). These beliefs were significantly higher among young adult male waterpipe smokers ($P < 0.001$).

Significantly more multiple users were aware of the pictorial health warnings on waterpipe tobacco packs than waterpipe-only users ($P < 0.001$). This was highest among young adult males (80.4%). Among females, older adult waterpipe-only users were more aware of pictorial health warnings (35.3%) than younger females (29.4%) ($P = 0.019$). Of those who knew about pictorial warnings, more multiple users discussed them often compared with

waterpipe-only users ($P < 0.001$) (Table 2), especially older males. Among females, only older adult waterpipe-only users reported that they often discussed pictorial health warnings.

Among those who knew of the pictorial health warnings, multiple users were significantly more

likely than waterpipe-only users to have changed their waterpipe tobacco smoking habit (reduced the number of *hagar* smoked, $P = 0.025$; foregone a smoke, $P < 0.001$; and considered quitting waterpipe smoking, $P = 0.006$) because of the warnings (Table 2). This change was more common in males (48.5% versus 10.1% of females,

Table 2 Behaviour and health beliefs of waterpipe-only users compared with multiple tobacco product users, Egypt, 2015–2017

Variable	Waterpipe-only user (n = 777)	Multiple tobacco product user (n = 713)	P-value
	No. (%)	No. (%)	
Smokes waterpipe			
Monthly	16 (2.1)	13 (1.8)	
Weekly	85 (10.9)	166 (23.3)	< 0.001
Daily	676 (87.0)	534 (74.9)	
Age when started waterpipe smoking (years)			
11–17	419 (53.9)	304 (42.6)	< 0.001
18+	358 (46.1)	409 (57.4)	
Place where usually smoke waterpipe			
Cafe/restaurant	309 (39.8)	384 (53.9)	
Home	319 (41.1)	155 (21.7)	< 0.001
Other	149 (19.2)	174 (24.4)	
Type of waterpipe tobacco smoked			
Plain	622 (80.1)	555 (77.8)	
Flavoured	135 (17.4)	126 (17.7)	0.125
Both	20 (2.6)	32 (4.5)	
Believes effects of smoking waterpipe tobacco on health are:			
Good	124 (16.0)	53 (7.4)	
Neither good nor bad	146 (18.8)	165 (23.1)	< 0.001
Bad	469 (60.4)	464 (65.1)	
Don't know	38 (4.9)	31 (4.3)	
Believes the harmful effects of smoking waterpipe tobacco compared to smoking cigarettes are:			
Fewer	128 (16.5)	115 (16.1)	
The same	184 (23.7)	145 (20.3)	0.021
More	403 (51.9)	417 (58.5)	
Don't know	62 (8.0)	36 (5.0)	
Believes the nicotine content of waterpipe tobacco compared to cigarette tobacco is:			
Lower	135 (17.4)	99 (13.9)	
The same	122 (15.7)	123 (17.3)	< 0.001
Higher	273 (35.1)	342 (48.0)	
Don't know	247 (31.8)	149 (20.9)	
Ever tried to quit, yes	156 (20.1)	134 (18.9)	0.551
Aware of pictorial health warnings on waterpipe tobacco packs, yes	471 (60.6)	503 (70.5)	< 0.001
Discussed pictorial health warnings on waterpipe tobacco packs with others, often^a	130/459 (28.3)	189/492 (38.4)	0.001
Pictorial health warnings on waterpipe tobacco packs changed waterpipe smoking habit^a	(n = 459)	(n = 492)	
Reduced <i>hagar</i>	276 (60.1)	337 (68.5)	0.025
Forgone a smoke	164 (35.7)	237 (48.2)	< 0.001
More likely to consider quitting	244 (53.2)	312 (63.4)	0.006

^aThese questions were answered only by those who responded "yes" to "Aware of pictorial health warnings on waterpipe tobacco packs"; a few responses were missing.

$P < 0.001$) and young adults (51.4% versus 41.7% of older adults, $P < 0.001$).

Predictors of multiple tobacco product use

The results of the univariate and multiple logistic regression analyses are shown in Table 3. Of the variables found significantly associated with multiple use among current waterpipe smokers in the univariate analysis, the following remained statistically significant in the logistic regression analysis: non-daily waterpipe smoking ($OR_a = 1.5$, 95% CI: 1.09–2.07), cafes being the usual place of smoking ($OR_a = 1.87$, 95% CI: 1.43–2.44), higher educational attainment (high school/university education) ($OR_a = 1.81$, 95% CI: 1.34–2.43), and knowledge of pictorial health warnings on waterpipe tobacco packs ($OR_a = 2.29$, 95% CI: 1.65–3.17).

Often discussing pictorial health warnings on waterpipe tobacco packs with others and considering changing waterpipe smoking habit because of the pictorial health warnings were highly correlated with knowledge of pictorial health warnings and so were removed from the analysis. A confounding effect of age and gender in relation to age at starting waterpipe smoking, marital status and educational level was observed; there were more females than males in the categories higher educational attainment, unmarried and late start of waterpipe smoking.

Discussion

Multiple tobacco product use was common among current waterpipe smokers in our participants. Almost half of them were either dual users or poly-users. These findings concur with the recent evidence from both high- and low/middle-income countries (5,6,13) that multiple tobacco product use is increasing, reaching up to 40% or

more among both adult and youth current tobacco users (8–11,23).

However, the estimates reported for multiple use among current tobacco users vary widely (0.5%–66.2%) depending on the type of tobacco (smoked or smokeless) studied (5,7,12,19). The term “multiple tobacco product use” has only recently been used in the literature and has appeared mainly in studies done in the USA (6,9,11,31). “Poly-use”, “dual use”, “other tobacco products”, “non-cigarette tobacco” and “alternative tobacco products” are terms that have been more often reported to indicate the use of more than one tobacco product. However, these terms have different definitions (32).

Notably, we found that young adult females used multiple tobacco products more often than males, which differs from the reported gender profile of multiple users from other countries (9,11). However, results from previous studies indicate a change in social and cultural smoking norms among women in Egypt, as use of both cigarettes and other tobacco products is increasing, especially among adolescents (29). Not only is the difference in smoking between youth and adult females closing (29), but the gender gap for waterpipe tobacco smoking is also narrowing, a finding reported in other countries in the region as well (33). Consistent with previous reports, the other tobacco product used by current waterpipe smokers in our study was mostly cigarettes (10,19). ENDS use was more common among young adult female waterpipe smokers in our study. Similarly, e-cigarettes were commonly used by multiple users in other studies (6,8,12,13). The use of non-cigarette products among cigarette smokers is thought to be an attempt to quit (20–22) but there are concerns that they may serve as an entry to cigarette use in young people (34). However, we did not examine the order in which

Table 3 Univariate and multivariable logistic regression analyses of factors associated with multiple tobacco product use among waterpipe smokers in Egypt, 2015–2017

Variable	Univariate analysis		Multivariable logistic regression analysis			
	OR (95% CI)	P-value	β	SE	OR_a (95% CI)	P-value
Female gender	1.75 (1.21–2.53)	0.003	0.383	0.230	1.47 (0.94–2.3)	0.095
Younger age	1.64 (1.32–2.03)	< 0.001	0.317	0.169	1.37 (0.99–1.91)	0.061
Higher education attainment	2.35 (1.82–3.04)	< 0.001	0.592	0.151	1.81 (1.34–2.43)	< 0.001
Unmarried	1.64 (1.32–2.03)	< 0.001	–0.113	0.174	0.89 (0.64–1.26)	0.518
Exposed to second-hand smoke at home	1.37 (1.09–1.69)	0.005	0.082	0.139	1.09 (0.83–1.43)	0.554
Non-daily waterpipe smoker	2.24 (1.71–2.94)	< 0.001	0.408	0.163	1.5 (1.09–2.07)	0.012
Older age at starting to smoke waterpipes	1.58 (1.28–1.93)	< 0.001	0.220	0.117	1.25 (0.99–1.57)	0.060
Usually smokes waterpipes in cafes	1.77 (1.44–2.17)	< 0.001	0.626	0.136	1.87 (1.43–2.44)	< 0.001
Believes waterpipe smoking is more harmful than cigarette smoking	1.31 (1.07–1.61)	0.010	0.030	0.144	1.03 (0.78–1.37)	0.833
Knows of health warning on waterpipe tobacco packs	1.57 (1.25–1.93)	< 0.001	0.827	0.167	2.29 (1.65–3.17)	< 0.001

OR = odds ratio; CI = confidence interval; SE = standard error; OR_a = adjusted odds ratio.

tobacco type was started. Other combinations of multiple use have been observed in the Eastern Mediterranean region (e.g. waterpipe and smokeless) (16) but we did not ask about smokeless use in our study as rates in Egypt for adult smokeless use are low, around 1% (26,35).

Unique to our study, we asked participants about their awareness of the existing waterpipe tobacco health warnings. Interestingly, we found that knowledge of waterpipe tobacco health warnings was a significant independent predictor of multiple use, and highly correlated with a positive change in the waterpipe smoking habits of participants (reduction in the number of *hagar* smoked, foregoing a smoke, being more likely to consider quitting). Multiple users in this case may have shifted to other tobacco products in an attempt to quit or because they were under the impression that they were smoking a “lighter” form of tobacco (20–22). We also found that the use of flavoured tobacco did not predict multiple use, as also reported in a US study (11).

Higher educational attainment was also a significant determinant of multiple use in our study. This could be partly explained by the large number of women in the higher educational categories in our participants, thus the link with increased rates of multiple use in this group. This finding is consistent with a previous study in Egypt that found a higher level of cigarette smoking among female participants with a university or higher educational level (29). The authors attributed this to targeted marketing strategies that aim to associate smoking with a liberated identity among female consumers in this group (29).

Another determinant of multiple use was smoking usually at cafes, which was also observed in another study that reported multiple tobacco use in 40% of bar patrons (9). Multiple users may not be as addicted to waterpipe tobacco smoke as waterpipe-only users, who have a device at home and smoked equally at home or at a cafe. Nonetheless, non-daily waterpipe smoking in our study was a predictor of multiple use, which concurs with a previous study that reported that dual waterpipe and cigarette smokers had fewer waterpipe sessions per week (19).

To maintain a continuous demand for their products, the tobacco industry targets potential new users and vulnerable groups, such as youth and women, with constantly evolving tobacco forms (26). The industry persuades smokers who intend to quit to select products

promoted as being of lower risk (20–22) and possible to use in smoke-free environments (11,26). These illusions encourage the use of multiple tobacco products and ignore the evidence of the associated risks (22,30). Wide-ranging tobacco-free strategies are needed to counter these tactics of the tobacco industry.

Our study had some limitations. It was based on a non-random sample which focused on waterpipe smokers, therefore the proportions for multiple tobacco product use in this subset may not represent the Egyptian population of smokers. Tobacco use was based on self-reporting and we did not ask respondents on the frequency or time of starting to use other tobacco products. In addition, because of the cross-sectional nature of the study design, we could not determine whether multiple tobacco product use among our participants was an attempt to quit or identify if there was a shift from one product to another.

Conclusions

Almost half of the current waterpipe smoker participants used multiple tobacco products. Multiple users were more likely to be younger than waterpipe-only users. Young adult female waterpipe smokers used ENDS significantly more than males. Non-daily waterpipe tobacco smoking, cafes being the usual place of smoking, higher educational attainment and knowledge of the pictorial health warnings on waterpipe tobacco packs were independent predictors of multiple tobacco product use. Our findings are exploratory and may be a basis for future investigations into the rate and frequency of this emerging behaviour. Studies that include possible tobacco product combinations are warranted to guide the expansion of policies to regulate non-cigarette products. Novel warnings and tailored interventions for young adults, especially females, are necessary to curb the simultaneous use of different tobacco products.

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Competing interests: None declared.

Consommation de différents produits du tabac chez les jeunes adultes fumeurs de pipe à eau en Égypte

Résumé

Contexte : La consommation de différents produits du tabac constitue une tendance émergente. Les études sur la consommation de différents produits du tabac parmi les fumeurs de pipe à eau sont en nombre limité.

Objectifs : La présente étude avait pour objectif d'évaluer la proportion des autres produits du tabac utilisés par les fumeurs adultes de pipe à eau en Égypte, ainsi que d'identifier les déterminants de la consommation de différents produits du tabac.

Méthodes : Des études populationnelles ont été conduites à l'aide de questionnaires d'entretien entre 2015 et 2017 dans le Caire urbain et dans la zone rurale de Menoufia. Les participants âgés de 18 ans ou plus étaient sélectionnés sur la base d'un échantillonnage dirigé non aléatoire par quotas. L'échantillon total incluait 2014 participants. Nous avons analysé les données de 1490 fumeurs de pipe à eau. Les variables enregistrées étaient le tabagisme, les croyances en matière de santé, les comportements en matière de consommation de tabac par pipe à eau, les caractéristiques socio-démographiques, et l'efficacité perçue des mises en garde sanitaires illustrées sur les paquets de tabac pour pipe à eau. Les fumeurs de pipe à eau ont été classés en deux catégories : les fumeurs de pipe à eau exclusifs et les fumeurs consommant différents produits du tabac.

Résultats : Près de la moitié (44,9 %) des fumeurs de pipe à eau consommaient différents produits du tabac ; 93,4 % étaient des consommateurs doubles et 6,6 % des polyconsommateurs. Les autres produits du tabac utilisés étaient les cigarettes (86,4 %), les inhalateurs électroniques de nicotine (7,0 %) ou les deux ensemble (6,6 %). Les consommateurs de différents produits du tabac étaient davantage susceptibles d'être plus jeunes que les consommateurs de pipe à eau exclusifs. Les jeunes femmes adultes consommatrices de tabac par pipe à eau utilisaient 12 fois plus les inhalateurs électroniques de nicotine que les jeunes hommes adultes (48,8 % contre 4,1% respectivement). La consommation non quotidienne de tabac par pipe à eau, ayant lieu le plus souvent dans des cafés, un niveau d'éducation supérieur et la connaissance des mises en garde sanitaires illustrées constituaient des facteurs prédictifs indépendants de la consommation de différents produits du tabac.

Conclusion : Selon notre étude, la consommation de différents produits du tabac était courante parmi les fumeurs de tabac par pipe à eau. Des interventions visant à s'attaquer au problème de la consommation de tabac autre que les cigarettes et de la consommation de différents produits du tabac, notamment chez les jeunes adultes, sont requises de toute urgence.

تعاطي منتجات متعددة من التبغ في صفوف مدخني الشيشة الشباب في مصر

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الخلاصة

الخلفية: ثمة اتجاه متزايد لتعاطي منتجات متعددة من التبغ. ولا يوجد سوى عدد محدود من الدراسات المتعلقة بتعاطي منتجات متعددة في صفوف مدخني الشيشة.

الأهداف: هدفنا في هذه الدراسة إلى تقييم نسبة منتجات التبغ الأخرى التي يتعاطاها مدخنو الشيشة البالغون الحاليون في مصر والوقوف على محددات تعاطي منتجات متعددة من التبغ.

طرق البحث: تم إجراء مسح سكانية باستخدام استبيانات قائمة على مقابلات خلال الفترة ٢٠١٥-٢٠١٧ في مدينة القاهرة وريف محافظة المنوفية. وتم اختيار المشاركين في الفئة العمرية أو ١٨ عاماً وأكثر باستخدام أسلوب العينات غير العشوائية الحصصية العمدية. وبلغ مجموع المشاركين في العينة ٢٠١٤ مشاركاً. وعمدنا إلى تحليل بيانات عن ١٤٩٠ مدخناً من المدخنين الحاليين للشيشة. وتضمنت المتغيرات المسجلة ما يلي: تعاطي التبغ، والمعتقدات الصحية، وسلوك تدخين الشيشة، والسمات الاجتماعية-السكانية، والفعالية المتصورة للتحذيرات الصحية المصوّرة على علب معسل الشيشة. وتم تصنيف مدخني الشيشة الحاليين إلى مدخني شيشة فقط ومدخني منتجات تبغ متعددة.

النتائج: تبين أن نحو نصف المدخنين الحاليين للشيشة (٩, ٤٧٪) يتعاطون منتجات تبغ متعددة؛ حيث يتعاطى ٤, ٩٣٪ منهم منتجاً اثنين ويتعاطى ٦, ٦٪ منتجات متعددة. وتضمنت منتجات التبغ الأخرى السجائر (٤, ٨٦٪) وأنظمة النيكوتين الإلكترونية (٧٪) أو كليهما (٦, ٦٪). وتبين أن تعاطي منتجات التبغ المتعددة هم على الأرجح أصغر سناً من مدخني الشيشة فقط. كما تبين أن مدخّنات الشيشة الشباب تستخدم أنظمة النيكوتين الإلكترونية أكثر من نظرائهن الشبان بواقع ١٢ مرة (٨, ٤٨٪ مقابل ١, ٤٪ على التوالي). وعُدّ تدخين الشيشة على أساس غير يومي - في المقاهي عادةً - وارتفاع مستوى التعليم، والمعرفة بالتحذيرات الصحية المصوّرة، مُنبئات مستقلة لتعاطي منتجات تبغ متعددة.

الاستنتاج: توصلت الدراسة إلى أن تعاطي منتجات التبغ المتعددة منتشر في صفوف مدخني الشيشة الحاليين المدرجين في دراستنا. وثمة حاجة ملحة لإجراء تدخلات بهدف التصدي لتعاطي منتجات التبغ من غير السجائر ومنتجات التبغ المتعددة، لا سيما في صفوف الشباب.

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