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Eastern Mediterranean Health Journal

المجلة الصحية لشرق المتوسط

La Revue de Santé de la Méditerranée orientale

Every year 8 million people die from tobacco

Cigarettes | Waterpipe | e-Cigarettes | Smokeless tobacco | Other tobacco products

Special issue on tobacco use in the Eastern Mediterranean Region

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المجلة الصحية لشرق المتوسط

هى المجلة الرسمية التى تصدر عن المكتب الإقليمى لشرق المتوسط بمنظمة الصحة العالمية. وهى منبر لتقديم السياسات والمبادرات الجديدة في الصحة العامة والخدمات الصحية والترويج لها، ولتبادل الآراء والمفاهيم والمعطيات الوبائية ونتائج الأبحاث وغير ذلك من المعلومات، وخاصة ما يتعلق منها بإقليم شرق المتوسط. وهى موجهة إلى كل أعضاء المهن الصحية، والكليات الطبية وسائر المعاهد التعليمية، وكذا المنظمات غير الحكومية المعنية، والمراكز المتعاونة مع منظمة الصحة العالمية والأفراد المهتمين بالصحة فى الإقليم وخارجه.

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Full implementation of the WHO Framework Convention on Tobacco Control in the Eastern Mediterranean Region is the responsibility of all

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Although the World Health Organization Framework Convention on Tobacco Control (FCTC) came into force in 2005, the tobacco control challenge continues to escalate. Despite the fact that tobacco use is finally projected to decrease in the Eastern Mediterranean Region (EMR), as indicated in the WHO Global Report on Trends in the Prevalence of Tobacco Use (*1*), the tobacco epidemic is still far from over.

The challenges facing the Region do not have a single source; the tobacco epidemic started as a multi-faceted problem and remains so today. The emergency situation in several EMR countries is pushing tobacco control down the list of priorities for decision-makers, whether directly or indirectly affected by regional conflict. The existence of unregulated and novel tobacco products, such as e-cigarettes, in many EMR countries complicates the situation further. Such products allow affordable access to tobacco products for young people, which consequently increases nicotine dependence and thus worsens the tobacco epidemic (*2*).

The apparent hesitation demonstrated by some Member States in taking action to implement WHO FCTC measures continues to be a significant issue. This is often due to worries regarding trade agreements and the threat of litigation, following case examples witnessed in Australia, Uruguay and other countries (*3–5*). Moreover, the influence of the tobacco industry and its continued interference in tobacco control policy-making remains a complicating factor (*6*).

As a consequence of this situation, the prevalence of young people using tobacco products is increasing in many countries, reaching as high as 40% among males aged 13–15 years in a number of countries in the Region. Furthermore, while in the past there was a generally low prevalence of females using tobacco products compared to males, a sharp increase in the prevalence of tobacco use among young females is being witnessed, especially in the use of waterpipe and smokeless tobacco (*7*).

Despite the many challenges in the Region, commitment to improving tobacco control measures does exist. Member States are confident of the value of reducing tobacco use, as is evident in the work led by ministries of health in coordination and collaboration with key partners, including legislators and parliamentarians. In 2018, during the 65th Session of the WHO Regional Committee for the Eastern Mediterranean, Member States adopted both the Regional Strategy and Action Plan for Tobacco Control (*8*) in addition to the Regional Framework for Tobacco Control (*9*)[1]. Results from the 2019 WHO Report on the Global Tobacco Epidemic indicate that about 70% of people in the Region are covered by at least two MPOWER measures at the highest level of achievement (*10*)[2]. Still, only 25% of people in the Region are covered by four MPOWER measures at the highest level (*10*). Efforts should not be limited to increasing political commitment among governments but should extend to stronger national action at the technical and policy fronts.

Full implementation of the WHO FCTC is needed to end the tobacco epidemic (*11–13*). Despite many countries globally having already achieved significant reductions in the prevalence of tobacco use (*14*), research shows that fully implementing the measures of the WHO FCTC and the MPOWER package could further reduce prevalence in countries of the Region by as much as 40% in 5 years (*15*).

This is an achievable goal, but cannot be attained by the efforts of one party alone. It requires collaboration by Member States, United Nations agencies, nongovernmental organizations, donors and other

[1] This Framework is included in this special supplement of the EMHJ.

[2] The WHO MPOWER package was introduced in 2008 as a tool to help countries implement demand-reduction measures of the WHO FCTC. It consists of the following six measures, of which the latter five are direct demand-reduction measures: Monitor tobacco use and prevention policies, Protect people from tobacco smoke, Offer help to quit tobacco use, Warn about the dangers of tobacco, Enforce comprehensive bans on tobacco advertising, promotion and sponsorship, and Raise taxes on tobacco. The coverage figures given here include just the direct demand-reduction measures (i.e. do not include the monitoring component).

stakeholders, who together stand firm in recognizing tobacco control as a public health priority. It is only through such prioritization and collaboration that by the next WHO FCTC anniversary one could expect to reach the WHO noncommunicable diseases voluntary target of a 30% reduction in tobacco use by 2025 (*16*). The Vision 2023 for the Eastern Mediterranean Region provides a concrete platform for collaboration and the reinforcement of strong partnerships with all stakeholders (*17*), underlining the fact that tobacco control is a fight in which every assistance counts and every action matters.

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Tobacco control in the Eastern Mediterranean Region: the urgent requirement for action

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The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) was developed in response to the globalization of the tobacco epidemic, and contains measures to reduce the demand for tobacco as well as reducing its production, distribution, availability and supply. Currently, 19 of the 22 Eastern Mediterranean Region (EMR) countries are parties to the WHO FCTC (*1*).

In line with the WHO FCTC, the World Health Organization (WHO) introduced a set of six cost-effective and high-impact measures that help countries to reduce demand for tobacco. Known as MPOWER, these measures include: *M*onitoring tobacco use and prevention policies, *P*rotecting people from tobacco smoke, *O*ffering help to quit tobacco use, *W*arning people about the dangers of tobacco, *E*nforcing bans on tobacco advertising, promotion and sponsorship, and *R*aising taxes on all tobacco products.

The WHO FCTC came into force in 2005, and 15 years later it is both important and opportune to take stock of the progress, review the practices, and highlight the gaps and the challenges facing tobacco control in the EMR. This is especially important given that, in the WHO's 2018 Global Report on Trends in Prevalence of Tobacco Smoking, the EMR was projected to be the only WHO Region (from a total of six WHO Regions worldwide) to see an increase in the prevalence of tobacco use among males (*2*). In addition, there is particular concern about a future rise in female prevalence, as indicated in the Global Youth Tobacco Surveys, which show a narrowing gender gap between rates of tobacco use in a number of countries in the Region (*3*).

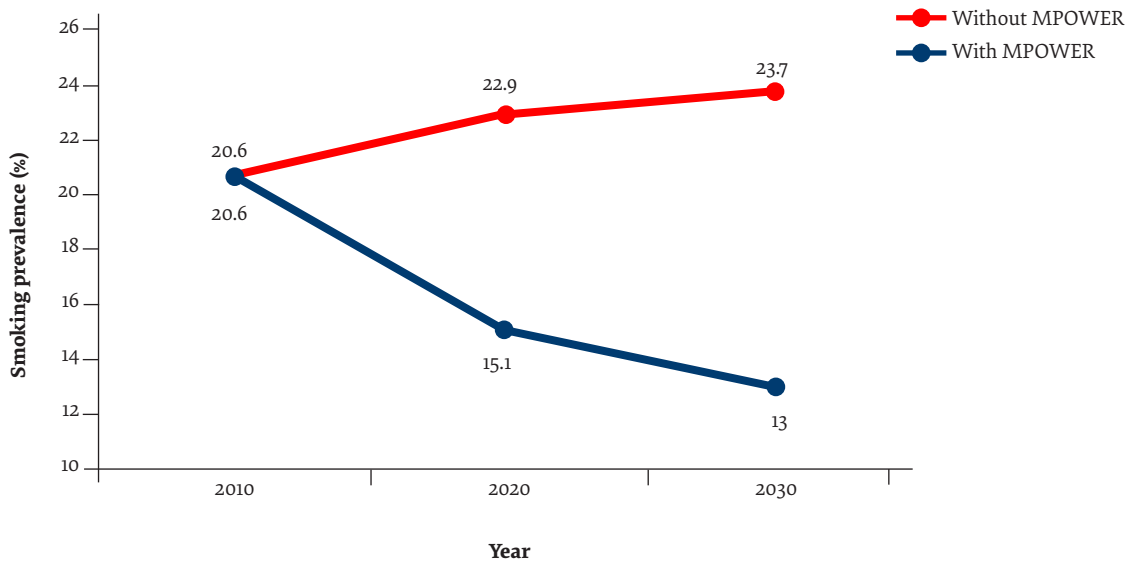
To date there have been some notable highlights throughout the Region following the adoption of noncommunicable disease voluntary targets. So far, 13 countries have adopted the global target of a 30% relative reduction in the prevalence of current tobacco use in persons aged over 15 years by 2025 (*4*). Monitoring of the tobacco epidemic through recent and representative surveys for both adults and young people has been attained by 12 EMR countries (*5*), with 63% of the population now being 100% protected from second-hand smoke in indoor public places by national legislations (*6*). A comprehensive ban on tobacco advertising, promotion and sponsorship has been implemented in 10 countries in the Region (*5*). An observatory has been established in Egypt to monitor and track tobacco advertising, promotion and sponsorship in Arabic language drama, and another two are currently under consideration (*7*). Medium to large pictorial cigarette packet warnings have been in implemented in 15 countries, with Saudi Arabia being the first country in the Middle East and Asia to require plain packing for all tobacco products. Over 91% of EMR countries offer some sort of support services for tobacco use cessation (*5*).

However, the EMR falls behind all other WHO regions in having the lowest average prices of tobacco products – an important factor when considering that decreasing affordability is the best-known measure to reduce uptake of smoking by young people (*5,8*). In addition, there is an immediate and future concern about the growing popularity of waterpipe use in the EMR and the emerging epidemic of electronic nicotine delivery systems and heated tobacco products. The latter are becoming an increasing challenge globally and in the EMR countries, although a growing number of countries are banning e-cigarettes and similar vaping products over increasing public health concerns (*9*).

Despite relatively good progress in the Region on tobacco control, no EMR country has fully implemented either the key WHO FCTC articles or the six crucial MPOWER measures. Only six EMR countries (Egypt, Islamic Republic of Iran, Kuwait, Pakistan, Qatar and Saudi Arabia) have implemented at least three MPOWER measures at the highest level as defined by WHO (*10*). With the prevalence of tobacco use predicted to rise in the coming years (*2*), it is vital that much stronger action be undertaken now, or the tobacco epidemic will have immense negative health and economic consequences for EMR countries. If fully implemented and enforced, the MPOWER measures could significantly reduce smoking prevalence in the EMR (Figure 1), falling from 20.6% of the population in 2010 to a predicted 13% by 2030 (*11*).

By 2023, in keeping with the goals of the WHO Regional Strategy and Action Plan for Tobacco Control, all EMR countries are expected to have ratified the WHO FCTC and developed comprehensive, multisectoral national tobacco control strategies, plans, programmes and infrastructure for WHO FCTC implementation

Figure 1 Reduction in smoking prevalence in the EMR if WHO FCTC measures represented by MPOWER are fully implemented and enforced



(*12*). However, this requires political commitment at the highest level of government throughout the Region. Furthermore, in accordance with the relevant articles of the WHO FCTC, it requires no less than immediate policy formulation and implementation of tax increases, creation of smoke-free areas in all indoor public places, schools and workplaces, and for a full ban on tobacco advertising, promotion and sponsorship.

It is also crucial to remember that WHO FCTC Article 5.3 precludes any involvement of the tobacco industry in formulating government policy for tobacco control (*13*). This applies to all branches of government, including the judiciary, the civil service and elected and appointed politicians. Many civil servants either simply fail to understand their obligations in this regard or choose to ignore this crucial undertaking. Successful and optimal implementation of Article 5.3 to eliminate the tactics of the tobacco industry in obstructing and undermining national and global tobacco control policies requires a multisectoral approach and deliberate collaboration among various stakeholder groups (e.g. government, civil society, and private sector). Since the WHO FCTC was signed by heads of states, it becomes the responsibility of the whole of government, not just the health ministry in each country, for its effective implementation. Failure to take the necessary measures will have repercussions on the health and economy of the populace of the EMR countries for decades to come. The task ahead for all EMR governments and civil society is certainly substantial, but not impossible to attain.

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Quantitative comparison of WHO tobacco control measures: lessons from the Eastern Mediterranean Region

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Abstract

Background: In 2008, the World Health Organization (WHO) introduced a package of measures including 6 main policies (MPOWER) to control tobacco use.

Aims: This study aimed to perform a quantitative analysis of MPOWER in the WHO regions.

Methods: This cross-sectional study collected information in summer 2018 using pages 136–149 of the 2017 MPOWER report and a validated check list with 10 criteria, with a possible maximum score of 37. The scores were summed and presented in descending order for the 6 WHO regions.

Results: The highest mean score was recorded by the European Region (26.41), followed by: South-East Asia Region (25), Western Pacific Region (24.88), Region of the Americas (22.05), Eastern Mediterranean Region (21.40) and African Region (17.40). There were significant differences ($P < 0.05$) in the means.

Conclusions: Although many efforts have been made in the Eastern Mediterranean Region, many challenges to policy implementation and enforcement remain compared with other regions, and require urgent action by governments in the Region.

Keywords: Eastern Mediterranean Region, MPOWER, policies, tobacco control, tobacco use

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Introduction

The hazards of smoking make the need for implementation of tobacco control programmes undeniable (*1*). Tobacco use remains the leading preventable cause of morbidity and mortality worldwide, and the rates of morbidity and mortality due to smoking-related diseases are rising. The prevalence of smoking has shifted from developed to developing countries during the last few decades and is increasing (*2*, *3*). The first and the most important strategy to confront this situation is the comprehensive implementation of tobacco control programmes (*4*,*5*). In this regard, the World Health Organization (WHO) negotiated the Framework Convention on Tobacco Control (FCTC) treaty in 2003, and so far, 181 countries have ratified it (*6*). In 2008, a package of measures was proposed for implementation, which included 6 main components: monitoring tobacco use and prevention policies; protection of people from tobacco smoke; offer of help to quit tobacco use; warning people about the dangers of tobacco; enforcing bans on tobacco advertising, promotion and sponsorship; and increasing taxes on tobacco (*7*). Global experiences have revealed that implementation of the above-mentioned strategies can effectively decrease the rate of consumption and consequences and complications of tobacco use (*8*–*11*). Some studies have shown that this type of analysis may pose a challenge to countries to improve their tobacco control status (*12*,*13*). A study in 2015 revealed the 15 countries with the highest scores for tobacco control worldwide (*14*).

Lessons can be learned from 10 years of implementing WHO FCTC and the demonstrated benefit in combating tobacco use (*15*,*16*). Cairney and Mamudu (*17*) reported that the best approach to tobacco control requires specific policy processes, namely: the department of health takes the policy lead; tobacco is framed as a public health problem; public health groups are consulted at the expense of tobacco control interests; socioeconomic conditions are conducive to policy change; and the scientific evidence is "set in stone" within governments. No country can meet all these requirements in a short period, and there is a wide gap between the expectations of implementing such programmes and the actual situation in many countries, particularly in the WHO Eastern Mediterranean Region. In 2016 and 2017, 2 studies showed that WHO FCTC implementation in the Region had not improved greatly over the past 6 years (*18*, *19*); countries had failed to adopt stronger and more effective policies and reinforce the existing laws.

In the present study, we performed a quantitative analysis of the above-mentioned report (*11*) and tracked the status of tobacco control programmes in the 6 WHO regions to create a challenge between countries to increase their performance.

Methods

This cross-sectional study in summer 2018 collected information regarding the status of tobacco control programmes implemented in different countries worldwide using pages 136–149 of the 2017 MPOWER report (*11*). Two tobacco control experts designed a checklist and 5 experts in the field approved the scoring system of the checklist (*12–14*). The checklist and the scoring system used are presented in Table 1. For assessment of the 10 criteria (6 policies plus 1, 2 compliance and 1 prevalence) included in the report of each country, a 0–4 point scale was used for scoring the 5-item criteria, and a 0–3 point scale was used for scoring the 4-item criteria. The maximum score was 37. The scores were entered independently in the data collection sheet by 2 individuals and a third party compared the values and confirmed their accuracy. The scores were summed and presented in descending order.

Differences in mean scores were analysed by *t* test and analysis of variance. $P < 0.05$ was considered statistically significant.

Results

The highest mean score was recorded by the European Region (26.41), followed by: South-East Asia Region (25), Western Pacific Region (24.88), Region of the Americas (22.05), Eastern Mediterranean Region (21.40) and African Region (17.40) (Table 2). There were significant differences ($P < 0.05$) between the means.

The top 23 countries for tobacco control, which had at least 85% of the total score (i.e., 32 out of 37) are shown in Table 3. African Region: Seychelles and Mauritius 33, 2 of 47 countries, 4.2% of region. Region of the Americas: Costa Rica 36, Brazil and Panama 35, Surinam and Colombia 34, Canada, Uruguay and Argentina 33, 8 of 35 countries, 22.8% of region. European Region: United Kingdom of Great Britain and Northern Ireland (UK) and Turkey 36, Portugal, Russia and Ireland 33, Romania, Estonia, Denmark, Spain and Norway 32, 10 of 53 countries, 18.8% of region. Eastern Mediterranean Region: Islamic Republic of Iran 34, 1 of 22 countries, 4.5% of region. South-East Asia Region: none. Western Pacific Region: Australia 35, New Zealand 34, 2 of 27 countries, 7.4% of region. Most of these countries (43%) were from the European Region.

The scores for the Eastern Mediterranean Region countries are presented in Table 4. Between 2015 and 2017, the total score increased by 43 points. The trends in MPOWER scores from 2011 to 2019 in Eastern Mediterranean Region countries are shown in Table 5. Tables for the other regions are in the Supplementary File.

Discussion

The Eastern Mediterranean Region has not done well in implementing tobacco control programmes compared to other regions, and was only better than the African Region. This issue should be addressed by health policy-makers in the countries of the Eastern Mediterranean Region and they should adopt more thorough and far-reaching plans. There was a direct association between higher scores and a reduction in tobacco use, which reflects the fact that implementation of tobacco control programmes in the community, has an impact on the general public and results in a reduction in tobacco use. Taxation, because of its low ranking, should be given more attention in the Eastern Mediterranean Region. Between 2011 and 2019, implementation of the MPOWER package in the Region was considered important by governments and some achievements were made (score increased from 416 to 509) but many challenges remain for tobacco control programmes to reach the maximum score of 814 (37 ´22).

The Islamic Republic of Iran and Egypt maintained their status, and Saudi Arabia, Pakistan, United Arab Emirates (UAE) and Qatar improved theirs. Many others tried to maintain their status and Somalia had no improvement. More tobacco control programmes have been recently introduced in the Region but they need more time to realize their effectiveness. There was insufficient increase in smoke-free policy compliance and insufficient decrease in smoking prevalence; therefore, it seems that tobacco control has not been effective in decreasing tobacco consumption in the Region and protecting people from second-hand smoke.

All countries need to increase taxation rates to improve the overall effectiveness of tobacco control measures. For example, Egypt had a high overall score in 2017 but did not score well in smoke-free policies; consequently, more effective reinforcement measures need to be taken. The 2017 data show some challenges in implementing MPOWER policies in certain countries; for example, in Kuwait and Saudi Arabia there was a decrease in compliance with smoke-free policies. At the same time, other policies remained unchanged in the countries, such as the inclusion of graphic health warnings on cigarette packets. There has also been little steady progress in implementation of other policies, for example, raising taxation (*20*).

None of the countries scored full points in the tobacco control programmes; however, 23 countries (Seychelles, Mauritius, Costa Rica, Brazil, Panama, Surinam, Colombia, Canada, Uruguay, Argentina, UK, Turkey, Portugal, Russia, Ireland, Romania, Estonia, Denmark, Spain, Norway, Islamic Republic of Iran, Australia and New Zealand) had a superior status according to the 2017 MPOWER report. These 23 countries may act as a best model for others to implement and enforce tobacco control programmes. Comparison of scores of different countries can be beneficial since it creates a challenge for the health policy-makers to find weaknesses in their tobacco control programmes and improve them. In 2015, 15 countries acquired the highest scores included Panama and Turkey with 35 points, Brazil and Uruguay with 34, Ireland, UK, Iran, Brunei, Argentina and Costa Rica with 33, and Australia, Nepal, Thailand, Canada and Mauritius with 32 (*14*). Comparison between that study and the present study shows that 4 countries (Brunei,

Table 1 WHO MPOWER score on tobacco control check list based on WHO report 2017

Adult daily smoking prevalence	4
Estimates not available	0
≥30	1
20–29%	2
15–19%	3
< 15%	4
Monitoring: prevalence data	3
No known data or no recent data or data that are not both recent and representative	0
Recent and representative data for either adults or youth	1
Recent and representative data for both adults and youth	2
Recent, representative and periodic data for both adults and youth	3
Smoke-free policies	4
Data not reported	0
Up to 2 public places completely smoke free	1
3–5 public places completely smoke free	2
6 or 7 public places completely smoke free	3
All public places completely smoke free	4
Cessation programme	4
Data not reported	0
None	1
NRT and/or some cessation services (neither cost covered)	2
NRT and/or some cessation services (at least one of which is cost covered)	3
National quit line, and both NRT and some cessation services cost covered	4
Health warning on cigarette packages	4
Data not reported	0
No warnings or small warnings	1
Medium-size warnings missing some appropriate characteristics	2
Medium-size warnings with all appropriate characteristics	3
Large warnings with all appropriate characteristics	4
Anti-tobacco mass media campaigns	4
Data not reported	0
No campaign conducted	1
Campaign conducted with 1–4 appropriate characteristics	2
Campaign conducted with 5 or 6 appropriate characteristics	3
Campaign conducted with all appropriate characteristics	4
Advertising bans	4
Data not reported	0
Complete absence or ban in print media	1
Ban on national television, radio and print media only	2
Ban on national television, radio and print media and some other media	3
Ban on all forms of direct and indirect advertising	4
Taxation	4
Data not reported	0
≤ 25% of retail price is tax	1
26–50% of retail price is tax	2
51–75% of retail price is tax	3
≥75 of retail price is tax	4
Compliance with bans on advertising	3
Complete compliance (8/10 to 10/10)	3
Moderate compliance (3/10 to 7/10)	2
Minimal compliance (0/10 to 2/10)	1
Not report	0
Compliance with smoke-free policy	3
Complete compliance (8/10 to 10/10)	3
Moderate compliance (3/10 to 7/10)	2
Minimal compliance (0/10 to 2/10)	1
Not reported	0
Total	37

NRT = nicotine replacement therapy; WHO = World Health Organization.

Table 2 Comparison of 6[a] WHO regions by total MPOWER WHO score[b] on tobacco control in 2017

Regions	Smoking prevalence	Monitoring	Smoke-free policies	Smoke-free policy compliance	Cessation programmes	Health warning on cigarette packages	Mass media campaigns	Advertising bans	Advertising bans compliance	Taxation	Total	Mean Scores 2017c
EURO	108	191	114	94	164	172	103	151	131	172	1400	26.41 ± 1.2 SD
SEARO	23	32	31	20	30	33	30	31	19	26	275	25 ± 1.1 SD
WPRO	63	84	66	39	78	80	66	75	62	68	672	24.88 ± 1.4 SD
AMRO	73	97	94	60	103	93	53	68	54	82	772	22.05 ± 1.6 SD
EMRO	42	51	51	15	60	53	38	73	41	47	471	21.04 ± 1.3 SD
AFRO	119	87	84	21	106	96	51	120	50	83	818	17.40 ± 1.5 SD

[a] *The full table of each region is in the Supplementary File.*
[b] *These are total scores for each of 10 indicators.*
[c] *The mean scores are total divided by number of countries in each region.*
AFRO = African Region; AMRO = Region of the Americas; EMRO = Eastern Mediterranean Region; EURO = European Region; SEARO = South-East Asia Region; WPRO = Western Pacific Region; WHO = World Health Organization.

Nepal, Thailand and Mauritius) left and 12 new countries were added to this group. This may challenge countries to have more focus on tobacco control.

Since the scores were close and most countries had a 1-point difference, more precise implementation of each strategy and publishing a more thorough report may change the scores and consequently the ranking of countries in this respect. In 2017, all the regions had higher total scores compared with 2015: African Region +52, Region of the Americas +59, South-East Asia Region +35, European Region +109, Eastern Mediterranean Region +43 and Western Pacific Region +43. The highest mean score of 3.18 was for the South-East Asia Region followed by 2.05 for the European Region. It is notable that the South-East Asia Region had no country in the top 23 but it had the best improvement regionally. The largest improvement was in Timor Leste +13, Cambodia +12, El Salvador and Romania +9, and Uganda, Rwanda and Syrian Arab Republic +8, and largest reduction was in Cameron -7, Luxemburg -6, San Marino, Libya and Swaziland -5.

To catch up with the progress of other WHO regions, in the Eastern Mediterranean Region, stronger measures need to be implemented and reinforced as part of comprehensive national plans that take into consideration all social and economic variables. A better outcome can be achieved by greater coordination and cooperation between the countries of the Region to draw up common control strategies. This has already been done successfully in other WHO regions in their fight against the global tobacco epidemic, as for example, in the European Region (21). The leading position of European countries in this regard was also found in a study by Joossens and Raw (22). No such study has been done in any other region of the world except in the Eastern Mediterranean Region (18); thus, this may be an important research topic for further studies and the results can be used to create a challenge and competition between countries in an effort to achieve better ranking.

The present study had some limitations. The MPOWER reports do not refer specifically to waterpipe and other forms of tobacco smoking. Political, social and economic variables that support or act as barriers to tobacco control were not investigated in this study. These factors should be investigated in future studies. The interference of the tobacco industry with the implementation of the control programmes is not well reflected in such surveys. It is well known that the tobacco industry typically uses its large profits to expand its production, distribution and sale of its products as well to influence policy-makers in order to impede tobacco control programmes.

Conclusion

Although many efforts have been made in the Eastern Mediterranean Region, compared with other regions, many challenges to policy implementation and enforcement remain and require urgent action by governments. Comparison of scores of different countries in this respect can be beneficial since it creates a challenge for

Table 3 **MPOWER WHO score on tobacco control for top 23 countries in 2017**

Country	Smoking prevalence	Monitoring	Smoke-free policies	Smoke-free policy compliance	Cessation programmes	Health warning on cigarette packages	Mass media campaigns	Advertising bans	Advertising bans compliance	Taxation	Score	Difference from 2015[a]
Costa Rica	4	4	4	3	3	4	4	3	3	3	36	+3
UK	3	4	4	3	4	4	4	3	3	4	36	+3
Turkey	2	4	4	3	4	4	4	4	3	4	36	+1
New Zealand	3	4	4	3	4	4	4	3	3	3	35	+7
Brazil	4	4	4	3	4	4	2	4	3	3	35	+1
Panama	4	4	4	3	4	4	2	4	3	3	35	–
Suriname	3	3	4	3	3	4	4	4	3	3	34	+4
Colombia	4	4	4	3	3	3	4	4	3	2	34	+3
Australia	4	4	4	0	4	4	4	3	4	3	34	+2
Islamic Republic of Iran	4	4	4	3	4	4	3	4	3	1	34	+1
Seychelles	3	3	4	3	3	4	4	3	3	3	33	+5
Portugal	3	4	3	3	3	4	4	3	3	3	33	+5
Russian Federation	2	4	4	3	3	4	3	4	3	3	33	+3
Canada	4	4	4	3	4	4	1	3	3	3	33	+1
Mauritius	3	3	3	3	3	4	4	4	3	3	33	+1
Uruguay	4	4	4	3	3	4	1	4	3	3	33	-
Argentina	3	4	4	3	3	4	3	3	3	4	33	–
Ireland	3	4	4	0	4	4	4	3	3	4	33	–
Romania	2	4	4	3	3	4	3	3	3	3	32	+9
Estonia	2	4	1	3	4	4	4	3	3	4	32	+7
Denmark	3	4	1	3	4	4	4	3	3	3	32	+5
Spain	3	4	4	3	3	3	1	4	3	4	32	+2
Norway	3	4	4	3	3	3	4	3	3	3	32	+1

[a]*Difference between total score from 2015 and 2017.*

UK = United Kingdom of Great Britain and Northern Ireland; WHO = World Health Organization.

Table 4 Eastern Mediterranean Region countries ranked by total WHO MPOWER score on tobacco control in 2017

Country	Smoking prevalence	Monitoring	Smoke-free policies	Smoke-free policy compliance	Cessation programmes	Health warning on cigarette packages	Mass media campaigns	Advertising bans	Advertising bans compliance	Taxation	Total scores 2017	Difference from 2015
Islamic Republic of Iran	4	4	4	3	4	4	3	4	3	1	34	+1
Pakistan	3	4	4	1	3	3	4	3	3	3	31	+4
Yemen	4	3	3	1	2	3	1	4	3	3	27	+5
Saudi Arabia	4	3	2	1	3	3	2	3	3	2	26	+3
Egypt	2	4	2	0	3	4	1	3	3	3	25	-
Lebanon	2	4	4	1	3	2	1	3	2	2	24	0
Jordan	0	2	2	1	3	2	4	3	2	4	23	+4
Morocco	3	2	2	1	2	1	4	3	1	3	22	+1
Djibouti	4	3	3	0	2	4	0	4	0	2	22	+2
Qatar	3	4	1	0	3	3	0	4	3	1	22	+4
Kuwait	3	4	2	0	4	3	1	4	0	1	22	-
Bahrain	2	2	0	0	3	3	2	4	3	2	21	+6
West bank and Gaza Strip	0	2	4	1	2	1	1	3	2	4	20	-
Oman	4	1	1	0	3	3	1	3	3	1	20	+5
Syrian Arab Republic	0	1	3	2	3	1	1	3	3	3	20	+8
United Arab Emirates	2	2	0	0	4	3	3	4	0	1	19	+3
Afghanistan	0	0	4	2	2	3	1	4	3	0	19	+7
Iraq	0	2	2	1	3	2	2	3	1	3	19	+4
Tunisia	2	1	1	0	3	2	3	3	0	3	18	-
Libya	0	1	4	0	3	1	1	4	3	1	18	-
Sudan	0	1	2	0	1	1	1	3	0	3	12	-
Somalia	0	1	1	0	1	1	1	1	0	1	7	+3
Total	42	51	51	15	60	53	38	73	41	47	471	+43

Mean score of the Region = 21.40.

WHO = World Health Organization.

Table 5 Trend in MPOWER scores on tobacco control by 5 WHO reports in Eastern Mediterranean Region, ranked based on 2019

Country	Total scores 2019	Total scores 2017	Total scores 2015	Total scores 2013	Total scores 2011
Islamic Republic of Iran	32	34	33	31	29
Pakistan	32	31	27	21	20
Saudi Arabia	32	26	23	23	19
Egypt	29	25	29	28	28
Qatar	28	22	21	21	18
United Arab Emirates	28	19	16	17	24
Yemen	27	27	22	17	17
Lebanon	25	24	24	26	17
Morocco	24	22	22	17	17
Bahrain	24	19	15	22	21
Iraq	24	18	15	18	15
Jordan	23	23	23	22	21
Kuwait	22	22	23	28	21
West Bank and Gaza Strip	22	20	21	25	20
Oman	22	20	15	21	14
Tunisia	22	18	20	21	17
Libya	19	18	23	22	21
Syrian Arab Republic	18	20	12	17	18
Afghanistan	17	19	12	13	9
Sudan	17	12	16	13	19
Djibouti	15	22	21	25	20
Somalia	7	7	4	6	7
Total (Region)	509	471	428	453	416

WHO = World Health Organization.

the countries to achieve a higher rank. The Region has to work more on full implementation of FCTC to reach a score of 814. Smoke-free policy compliance is the most challenging indicator for the Region. Somalia and Sudan must consider tobacco control as a top priority in their health programme. Some countries such as the Islamic Republic of Iran, Kuwait, Iraq and Libya must work more on tobacco taxation. For some countries such as Egypt, UAE, Oman, Kuwait, Libya, Afghanistan and Djibouti, mass media campaigns are important. Health warnings on cigarette packages must change in Morocco, Gaza and Syrian Arab Republic.

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Comparaison quantitative des mesures de lutte antitabac de l'OMS : enseignements tirés pour la Région de la Méditerranée orientale

Résumé

Contexte : En 2018, l'Organisation mondiale de la Santé (OMS) a présenté un ensemble de mesures comprenant six politiques principales (MPOWER) en matière de lutte antitabac.

Objectifs : la présente étude avait pour objectif de réaliser une analyse quantitative du programme MPOWER dans les Régions de l'OMS.

Méthodes : La présente étude transversale a permis de recueillir des informations au cours de l'été 2018 en utilisant les pages 136 à 149 du rapport MPOWER 2017 et une liste de contrôle validée de 10 critères. Le score maximum possible était de 37. Ces scores ont été additionnés et présentés par ordre décroissant pour les six Régions de l'OMS.

Résultats : Le score moyen le plus élevé a été obtenu par la Région de l'Europe (26,41), suivie par la Région de l'Asie du Sud-Est (25), la Région du Pacifique occidental (24,88), la Région des Amériques (22,05), la Région de la Méditerranée orientale (21,40) et la Région de l'Afrique (17,40). On a observé une différence significative ($p < 0,05$) en termes de moyennes.

Conclusions : Bien que des progrès notables aient été réalisés dans la Région de la Méditerranée orientale, de nombreux défis entravant la mise en œuvre et l'application des politiques, par rapport aux autres régions, persistent et requièrent une intervention de toute urgence de la part des gouvernements de la Région.

مقارنة كمية لإجراءات مكافحة التبغ في منظمة الصحة العالمية: دروس مستفادة من إقليم شرق المتوسط

غلام رضا حيدري

الخلاصة

الخلفية: طرحت منظمة الصحة العالمية في سنة ٢٠٠٨ مجموعة من تدابير مكافحة تعاطي التبغ تضمنت ست سياسات رئيسية مجموعة (MPOWER) لمواجهة تعاطي التبغ.

الأهداف: هدفت هذه الدراسة إلى إجراء تحليل كمي لمجموعة السياسات الست في البلدان وفي أقاليم منظمة الصحة العالمية.

طرق البحث: جُمعت المعلومات في هذه الدراسة الشاملة لعدة قطاعات من الصفحات ١٣٦ إلى ١٤٩ من تقرير «مجموعة السياسات الست» لعام ٢٠١٧ باستخدام قائمة مرجعية مصدق عليها تحمل ١٠ معايير، وحصيلة نقاط قصوى محتملة بقيمة ٣٧. وجُمعت النقاط وعُرضت بترتيب تنازلي حسب أقاليم منظمة الصحة العالمية الستة.

النتائج: سجل المكتب الإقليمي لأوروبا أعلى متوسط نقاط (٤١ , ٢٦)، وتلاه إقليم جنوب شرق آسيا (٠٩ , ٢٥)، ثم إقليم غرب المحيط الهادئ (٨٨ , ٢٤)، ثم إقليم الأمريكتين (٠٥ , ٢٢)، ثم إقليم شرق المتوسط (٤٠ , ٢١)، ثم الإقليم الأفريقي (٤٠ , ١٧). وكان الاختلاف بين متوسط النقاط شاسعاً في هذا الصدد (القيمة الاحتمالية < ٠٥ , ٠).

الاستنتاج: على الرغم من الإنجازات المهمة التي تحقّقت في إقليم شرق المتوسط، لا يزال هناك الكثير من التحديات أمام تنفيذ السياسات، وهو ما يتطلب اتخاذ إجراءات عاجلة من جانب الدول الأعضاء.

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Self-reported addiction to and perceived behavioural control of waterpipe tobacco smoking and its patterns in Egypt: policy implications

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Abstract

Background: Studies on waterpipe tobacco dependency are currently limited.

Aims: This study assessed self-reported addiction to waterpipe tobacco smoking among Egyptian waterpipe smokers and identified the associated sociodemographic factors, perceived behavioural control and patterns of waterpipe tobacco smoking.

Methods: Cross-sectional surveys were conducted on Egyptian adults in 2015 and 2017. Data on 1490 current waterpipe smokers were analysed including: sociodemographic characteristics, waterpipe tobacco smoking behaviour (age at starting, frequency, amount, company and place of smoking, and expenditure), perceived harm of waterpipe tobacco smoking, and self-reported addiction to and perceived behavioural control of waterpipe smoking (ability to quit, difficulty in quitting, quit attempts and intention to quit).

Results: A quarter (25.8%) of the participants self-reported addiction to waterpipe tobacco smoking (males 27.1%, females 11.6%). Participants who considered themselves addicted reported less confidence in their ability to quit, fewer quit attempts, less intention to quit and less perceived harm of waterpipe smoking than those not addicted ($P < 0.001$). Variables associated with self-reported addiction were: younger age at starting waterpipe tobacco smoking (ORa = 2.2, 95% CI: 1.7–2.9), daily waterpipe tobacco smoking (ORa = 2.0, 95% CI: 1.1–3.5), smoking alone (ORa = 2.0, 95% CI: 1.4–2.8), being married (ORa = 1.8, 95% CI: 1.2–2.9), and monthly spending on waterpipe smoking of ≥ 150 Egyptian pounds (US$ 8.6) (ORa = 4.1, 95% CI: 2.9–5.6).

Conclusions: Comprehensive waterpipe-specific policies are needed including education on waterpipe tobacco smoking dependency, increased taxation to decrease affordability of waterpipe tobacco and cessation programmes addressing perceived self-efficacy and addiction to waterpipe tobacco smoking.

Keywords: waterpipe tobacco smoking, behaviour, dependence, policy, Egypt

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Introduction

Waterpipe tobacco smoking is a growing global public health concern because of its associated disability, disease and compulsive use in some smokers (*1,2*). Countries of the World Health Organization's (WHO) Eastern Mediterranean Region are at the centre of this epidemic (*3*). Member States, including Egypt, have agreed on a global target to achieve a 30% relative reduction in tobacco use by 2025 (*4*); however, the overall tobacco smoking rates in Egypt are projected to increase by at least 20% among males by this time (*5*). In Egypt, recent national estimates of the prevalence of current waterpipe tobacco smoking were 8.7% and 0.1% in males and females aged 15–69 years old, respectively (*6*). Trends suggest this gender gap is closing. Young females are increasingly using non-cigarette tobacco products, including waterpipe tobacco, more than young males and older females (*7,8*).

Despite this growing prevalence and documented harm, waterpipe tobacco smoking has been inadequately addressed by national tobacco control policies. The behaviour of waterpipe tobacco smokers has not been fully characterized and waterpipe tobacco is often mislabelled as an occasional method of tobacco use (compared with cigarette smoking). However, in recent population-based surveys, 50–80% of Egyptian waterpipe smokers reported daily use of waterpipe tobacco (*6,9*). In addition, doubts have been raised about whether waterpipe tobacco smoking leads to dependence (*10*). The limited amount of relevant research may have contributed to this uncertainty (*1*).

Research investigating factors associated with waterpipe tobacco dependence are limited. In particular, little is known about whether waterpipe smokers consider themselves addicted to waterpipe tobacco smoking. This self-identification is crucial in order to progress along the stages of behavioural change from precontemplation,

where the smoker is in denial of their addictive smoking behaviour, towards contemplation, where the smoker starts considering smoking cessation (*11*). It is at this later stage that the smoker can get most benefit from cessation interventions.

It is important to characterize the context in which waterpipe smokers consider quitting because dependence is a multidimensional matter. It would help us understand this context if information were available on frequency and intensity (amount of waterpipe tobacco smoked) of waterpipe tobacco smoking (as proxy measures of dependence); price of and expenditure on waterpipe tobacco (as measures of affordability); place where waterpipe tobacco smoking takes place and is obtained (as measures for accessibility); whether waterpipe tobacco smoking is done in company or alone and type of tobacco smoked (as measures of social desirability); and perceived harm and behavioural control of waterpipe smoking (as measures of self-efficacy) (*1*). Few data are available on how the sociodemographic characteristics of waterpipe smokers and the patterns of waterpipe tobacco use could influence smokers' perceived behavioural control, and hence their self-identification as being dependent on waterpipe tobacco.

Examining these variables is important in order to develop and tailor evidence-based interventions to reduce waterpipe tobacco smoking. Relevant evidence may better inform comprehensive policy interventions that tackle both supply and demand measures for effective tobacco control, as recommended by the WHO Framework Convention on Tobacco Control, such as cessation, taxation and education interventions *(12)*. The aim of this study therefore was to assess self-reported addiction to waterpipe tobacco smoking in adult Egyptian waterpipe smokers and identify the associated sociodemographic factors, waterpipe tobacco smoking behaviour, perception of harm and behavioural control of waterpipe tobacco smoking.

Methods

Specifics of the study design, sample, survey tool and procedures have been detailed previously *(8,9)*. Briefly, data included in this study are part of a study that consisted of two identical cross-sectional surveys done in July to November 2015 and September 2016 to January 2017. Participants were recruited from a purposive quota sample of 2014 waterpipe smokers and non-smokers living in Cairo and a village in the Nile Delta. Male and female participants were invited to take part in a face-to-face interview survey if they were 18 years or older. For this study, data were analysed on current waterpipe smokers only (n = 1490, 74.0% of the total sample) including participants' sociodemographic characteristics, tobacco use, exposure to household second-hand smoke, waterpipe tobacco smoking behaviour, perceived harm of waterpipe tobacco smoking, self-reported addiction to waterpipe tobacco smoking and perceived behavioural control of waterpipe tobacco smoking .

Participant characteristics

Participants' sociodemographic characteristics included: age, gender, residence, educational level, occupation, marital status and crowding index. The study also assessed whether waterpipe smokers had smoked cigarettes in the 30 days before the survey and their household exposure to second-hand smoke from cigarette smoking or waterpipe tobacco smoking.

Waterpipe tobacco smoking behaviour

Age at starting to smoke waterpipe tobacco was recorded. Current use was defined as any waterpipe tobacco smoking in the 30 days before the survey *(13)*. Current waterpipe smokers described their usual frequency of waterpipe tobacco smoking as: monthly (at least once a month, but not weekly), weekly (at least once a week, but not daily) or daily (at least once a day or on most days of the month). The time of the last waterpipe session was also assessed (today, a couple of days ago, last week, last month). Participants reported the intensity of waterpipe tobacco smoking as number of waterpipe tobacco portions (*hagar*) smoked a day and in the past 30 days. The usual place where participants smoke the waterpipe (café/restaurant, at home, workplace, at a friend's place) was assessed as were their average frequency of waterpipe tobacco smoking at cafés in the past 30 days, whether they usually smoked the waterpipe alone (always, most of the time, sometimes, never) or in the company of others, and the waterpipe tobacco type they usually smoked (flavoured or unflavoured). Participants were asked about where they usually purchased waterpipe tobacco (market, street vendor, smoke shop, café or restaurant, friend or relative, Internet, other). Participants were also asked about their average daily spending on waterpipe tobacco smoking – prices are reported in Egyptian pounds and converted to American dollars (US $) *(14)* – and the percentage of their monthly income they spent on waterpipe tobacco smoking (≤ 1%, 2–10%, 11–50%, > 50%).

Perceived harm of waterpipe tobacco smoking

Participants were asked how often they thought about the cost of waterpipe tobacco smoking (never, sometimes, often); what effect they thought waterpipe tobacco smoking had on health in general (good, bad, neither good nor bad, don't know); how often they worried about the health hazards of waterpipe tobacco smoking (never, sometimes, often); how harmful they thought waterpipe tobacco smoking was compared with cigarettes (less harmful, about the same, more harmful, don't know); and how much nicotine was in waterpipe tobacco smoking compared with cigarettes (less nicotine, about the same, more nicotine, don't know).

Self-reported addiction to and perceived behavioural control of waterpipe tobacco smoking

To assess how current waterpipe smokers perceived their dependence on waterpipe tobacco smoking, participants were asked if they considered themselves addicted to

waterpipe tobacco smoking (yes, no, don't know); if they were confident in their ability to quit waterpipe tobacco smoking (perceived self-efficacy) any time they wanted (yes, no); how easy they thought it would be to permanently quit waterpipe tobacco smoking (easy, difficult, don't know); whether they had any intention to quit waterpipe tobacco smoking (not at all, in the next month, in the next 6 months, in the future) and whether they had ever attempted to quit waterpipe tobacco smoking (yes, no).

Statistical analysis

For the descriptive analysis, means, standard deviations (SD), medians and interquartile ranges (IQR) were calculated for continuous variables and proportions were calculated for categorical variables. No statistically significant differences were found in the background characteristics of current waterpipe smokers in the two surveys. Therefore, data from both rounds of the survey were combined for all current waterpipe smokers (n = 1490). Univariate analysis was done using the chi-squared test for categorical variables and the independent samples t-test for continuous variables to identify statistically significant associations between participants' self-reported addiction (dependent variable) and their characteristics (sociodemographic, exposure to household second-hand smoke, use of cigarettes in the past 30 days), waterpipe tobacco smoking behaviour, perceived harm of waterpipe tobacco smoking and perceived behavioural control of waterpipe tobacco smoking.

For self-reported addiction to waterpipe tobacco smoking, "don't know" answers" were considered as "no". Multivariable logistic regression analyses were done to identify independent factors associated with self-reported addiction to waterpipe tobacco smoking. The following variables were tested as independent determinants of self-reported addiction to waterpipe tobacco smoking: male gender, older age, higher educational level, employed, married, no history of cigarette smoking in the past 30 days, daily waterpipe tobacco smoking, younger age at starting waterpipe tobacco smoking, usually smoking the waterpipe at home, smoking the waterpipe alone, using unflavoured waterpipe tobacco, self-purchase of waterpipe tobacco (from a market/street vendor/smoke shop/internet) and spending 150 Egyptian pounds (US$ 8.6) or more a month on waterpipe tobacco smoking.

All variables that were statistically significant in the univariate analysis at $P \leq 0.05$ were entered into the multivariable regression model. Adjusted odds ratios (ORa) and 95% confidence intervals (CI) are reported. The significance level was set as 0.05. SPSS, version 25 was used for all analyses.

Ethical considerations

The study was approved by the Ethical Review Board of the Faculty of Medicine, Ain Shams University, Cairo, Egypt. Verbal informed consent to take part in the surveys was obtained from all the participants.

Results

Participant characteristics and self-reported addiction to waterpipe tobacco smoking

A quarter (384, 25.8%) of current waterpipe smokers self-reported addiction to waterpipe tobacco smoking (Table 1). Participants' sociodemographic characteristics are shown in Table 1. More than two thirds (1009, 67.7%) of the participants were exposed to second-hand smoke at home, and almost half of the participants (663, 44.5%) reported smoking cigarettes in the 30 days before the survey. The crowding index was average (2 to 3) (Table 1). Significantly more of the participants who self-reported addiction to waterpipe tobacco smoking than those who did not were male, older, had a lower educational level, were employed, married, and had not smoked cigarettes in the 30 days before the survey (Table 1).

Waterpipe tobacco smoking behaviour and self-reported addiction

The mean age at starting to smoke waterpipe tobacco in current waterpipe smokers was 18.3 (SD 3.5) years. Most of the respondents (1210, 81.2%) smoked daily, smoked on average 5.8 (SD 3.5) waterpipe hagar a day, and smoked at least 25 hagar in the 30 days before the survey. Almost half of the participants (719, 48.2%) reported usually smoking the waterpipe at home/work, although participants reported an average 8.5 (SD 9.1) café visits for waterpipe tobacco smoking in the 30 days before the survey. Most participants usually smoked on their own (1041, 69.9%), smoked unflavoured tobacco (1229, 82.5%) and purchased their waterpipe tobacco themselves from markets or smoke shops (797, 53.5%). Mean daily spending on waterpipe tobacco smoking was 12.0 Egyptian pounds (US$ 0.7) and 1213 (81.4%) participants spent 2–10% of their monthly income on waterpipe tobacco smoking (Table 2).

Significantly more participants who self-reported addiction to waterpipe tobacco smoking than those who did not started waterpipe tobacco smoking at a younger age, were daily smokers, smoked on average more hagar a day and in the 30 days before the survey, usually smoked at home or at work, smoked alone, smoked unflavoured tobacco and purchased their waterpipe tobacco from markets or smoke shops. However, their mean daily spending on waterpipe tobacco smoking and per cent of their monthly income spent on waterpipe tobacco smoking did not differ much from those who did not self-report addiction to waterpipe tobacco smoking (Table 2).

Perceived harm of waterpipe tobacco smoking and self-reported addiction

Only 491 (33.0%) of current waterpipe smokers thought about how much this habit cost them. Two thirds of them (933, 62.6%) thought waterpipe tobacco smoking was bad for health; however, only 446 (29.9%) often worried about the health hazards of waterpipe tobacco smoking. Compared with cigarettes, 820 (55.0%) of current waterpipe smokers thought waterpipe tobacco smoking was more harmful and 615 (41.3%) thought waterpipe tobacco con-

Table 1 Characteristics of current waterpipe tobacco smokers who self-reported addiction to waterpipe tobacco smoking compared to those who did not

Characteristic	Total (*n* = 1490)	Self-reported addiction to waterpipe tobacco smoking		*P*-value [a]
		No (*n* = 1106)	Yes (*n* = 384)	
Age (years)				
Mean (SD)	35.5 (13.5)	33.3 (13.7)	41.8 (14.1)	< 0.001
Min–max, median (IQR)	18–87, 35 (23–46)	18–75, 31.5 (22–43)	18–87, 42.0 (31–54)	
	No. (%)	**No. (%)**	**No. (%)**	**P-value [b]**
Age group (years)				
18–24	535 (35.9)	447 (40.4)	88 (22.9)	< 0.001
≥ 25	955 (64.1)	659 (59.6)	296 (77.1)	
Gender				
Male	1361 (91.3)	992 (89.7)	369 (96.1)	< 0.001
Female	129 (8.7)	114 (10.3)	15 (3.9)	
Residence				
Rural	883 (59.3)	650 (58.8)	233 (60.7)	0.547
Urban	607 (40.7)	456 (41.2)	151 (39.3)	
Educational level				
No schooling/primary/ middle/secondary	604 (40.5)	492 (44.5)	112 (29.2)	< 0.001
Vocational/university	886 (59.5)	614 (55.5)	272 (70.8)	
Occupation				
Unskilled or manual worker/ student/unemployed[c]	468 (31.4)	385 (34.8)	83 (21.6)	< 0.001
Professional/technical/ skilled	1022 (68.6)	721 (65.2)	301 (78.4)	
Marital status				
Unmarried	527 (35.4)	458 (41.4)	69 (18.0)	< 0.001
Married	963 (64.6)	648 (58.6)	315 (82.0)	
Exposure to second-hand smoke at home (cigarettes or waterpipe tobacco smoke)				
No	481 (32.3)	351 (31.7)	130 (33.9)	0.448
Yes	1009 (67.7)	755 (68.3)	254 (66.1)	
Crowding index (persons per room)				0.003
< 2	585 (39.3)	407 (36.8)	178 (46.4)	
2–3	885 (59.4)	682 (61.7)	203 (52.9)	
> 3	20 (1.3)	17 (1.5)	3 (0.8)	
Smoked cigarettes in the past 30 days				
No	827 (55.5)	581 (52.5)	246 (64.1)	< 0.001
Yes	663 (44.5)	525 (47.5)	138 (35.9)	

[a] *Independent samples t-test.*

[b] *Chi-squared test.*

[c] *Unemployed includes retired.*

P-values < 0.05 indicate statistically significant differences between current waterpipe smokers who self-reported addiction to waterpipe tobacco smoking and those who did not.

tained more nicotine. Significantly fewer participants who self-reported addiction to waterpipe tobacco smoking than those who did not perceive the harms of waterpipe tobacco smoking (Table 3).

Perceived behavioural control of waterpipe tobacco smoking and self-reported addiction

Of the current waterpipe smokers, 678 (45.5%) were confident in their ability to quit waterpipe tobacco smoking any time they decided to, although 663 (44.5%) thought quitting waterpipe tobacco smoking permanently would be difficult. Only 290 (19.5%) participants had previously attempted to quit waterpipe tobacco smoking but 953 (64.0%) intended to quit, although 872 (58.5%) of them had not set a quit date (Table 3).

Significantly fewer participants who self-reported addiction to waterpipe tobacco smoking than those who did not were confident that they could quit waterpipe

Table 2 Waterpipe tobacco smoking behaviour of current waterpipe smokers who self-reported addiction to waterpipe tobacco smoking compared with those who did not

Waterpipe Tobacco Smoking behaviour	Total (*n* = 1490)	Self-reported addiction to waterpipe tobacco smoking		*P*-value
		No (*n* = 1106)	Yes (*n* = 384)	
Age at starting waterpipe tobacco smoking (years)				
Mean (SD)	18.3 (3.5)	18.6 (3.6)	17.6 (3.1)	0.002[a]
Min–max, median (IQR)	11–40, 18 (16–19)	11–40, 18 (17–20)	11–35, 17 (16–18)	
Self-reported usual frequency of waterpipe tobacco smoking, No. (%)[b]				< 0.001[c]
Monthly	29 (1.9)	25 (2.3)	4 (1.0)	
Weekly	251 (16.8)	239 (21.6)	12 (3.1)	
Daily	1210 (81.2)	842 (76.1)	368 (95.8)	
No. of hagar smoked a day[d]				
Mean (SD)	5.8 (3.5)	5.2 (3.1)	7.4 (4.1)	< 0.001[a]
Min–max, median (IQR)	1–30, 6 (2–8)	1–20, 5 (2–8)	1–30, 8 (4–10)	
No. of hagar smoked in the past 30 days, no. (%)[d]				< 0.001[c]
< 4	24 (1.6)	21 (1.9)	3 (0.8)	
4–9	122 (8.2)	117 (10.6)	5 (1.3)	
10–14	21 (1.4)	19 (1.7)	2 (0.5)	
15–19	38 (2.6)	36 (3.3)	2 (0.5)	
20–24	68 (4.6)	65 (5.9)	3 (0.8)	
≥ 25	1217 (81.7)	848 (76.7)	369 (96.1)	
Usual place to smoke the waterpipe tobacco, no. (%)[b]				< 0.001[c]
Café/restaurant	693 (46.5)	554 (50.1)	139 (36.2)	
At home	474 (31.8)	313 (28.3)	161 (41.9)	
Workplace	245 (16.4)	164 (14.8)	81 (21.1)	
At a friend's place	78 (5.2)	75 (6.8)	3 (0.8)	
No. of times smoked a waterpipe at a café in the past 30 days				
Mean (SD)	8.5 (9.1)	8.6 (8.7)	8.1 (10.0)	< 0.001[a]
Min–max, median (IQR)	0–30, 5 (0–13)	0–30, 6 (0–12)	0–30, 3 (0–15)	
Usually smokes waterpipe alone, No. (%)[b]				< 0.001[c]
No	449 (30.1)	378 (34.2)	71 (18.5)	
Yes	1041 (69.9)	728 (65.8)	313 (81.5)	
Type of waterpipe tobacco usually smoked, No. (%)[b]				0.002[c]
Flavoured	261 (17.5)	213 (19.3)	48 (12.5)	
Unflavoured	1229 (82.5)	893 (80.7)	336 (87.5)	
Usual source of waterpipe tobacco, No. (%)[b]				0.001[c]
Market/street vendor/smoke shop	797 (53.5)	561 (50.7)	236 (61.5)	
Café/restaurant	662 (44.4)	524 (47.4)	138 (35.9)	
Friend or relative	11 (0.7)	9 (0.8)	2 (0.5)	
Internet/other	20 (1.3)	12 (1.1)	8 (2.1)	
Amount spent a day on waterpipe tobacco smoking (Egyptian pounds)[e]				
Mean (SD)	12.0 (17.8)	11.9 (17.3)	12.5 (19.0)	0.421[a]
Min–max, median (IQR)	1–100, 5 (3–10)	1–100, 4 (3–12)	1–100, 4 (1–5)	
Percentage of monthly income spent on waterpipe tobacco smoking, No. (%)[b]				0.037[c]
≤ 1	194 (13.0)	147 (13.3)	47 (12.2)	
2–10	1213 (81.4)	893 (80.7)	320 (83.3)	
11–50	81 (5.4)	66 (6.0)	15 (3.9)	
> 50	2 (0.1)	0 (0.0)	2 (0.5)	

[a] *Independent samples t-test.*

[b] *Percentages may not sum to 100% because of rounding.*

[c] *Chi-squared test.*

[d] *Waterpipe tobacco portion.*

[e] *US$ 1 = 17.545 Egyptian pounds (14).*

P-values < 0.05 indicate statistically significant differences between current waterpipe smokers who self-reported addiction to waterpipe tobacco smoking and those who did not.

Table 3 Perceived harm and perceived behavioural control of waterpipe tobacco smoking in current waterpipe smokers who self-reported addiction to waterpipe tobacco smoking compared with those who did not

Perceived harm and perceived behavioural control of waterpipe tobacco smoking	Total (*n* = 1490)	Self-reported addiction to waterpipe tobacco smoking		*P*-value[a]
		No (*n* = 1106)	Yes (*n* = 384)	
	No. (%)[b]	No. (%)[b]	No. (%)[b]	
Think about the cost of waterpipe tobacco smoking				< 0.001
Never	999 (67.0)	686 (62.0)	313 (81.5)	
Sometimes	431 (28.9)	369 (33.4)	62 (16.1)	
Often	60 (4.0)	51 (4.6)	9 (2.3)	
Worry about health hazards of waterpipe tobacco smoking				< 0.001
Never	394 (26.4)	211 (19.1)	183 (47.7)	
Sometimes	650 (43.6)	514 (46.5)	136 (35.4)	
Often	446 (29.9)	381 (34.4)	65 (16.9)	
In general, effect of waterpipe tobacco smoking on health is:				0.016
Good	177 (11.9)	125 (11.3)	52 (13.5)	
Neither good nor bad	311 (20.9)	239 (21.6)	72 (18.8)	
Bad	933 (62.6)	681 (61.6)	252 (65.6)	
Don't know	69 (4.6)	61 (5.5)	8 (2.1)	
Compared with cigarettes, waterpipe tobacco smoking is:				0.003
Less harmful	243 (16.3)	195 (17.6)	48 (12.5)	
About the same harm	329 (22.1)	221 (20.0)	108 (28.1)	
More harmful	820 (55.0)	614 (55.5)	206 (53.6)	
Don't know	98 (6.6)	76 (6.9)	22 (5.7)	
Compared with cigarettes, waterpipe tobacco contains:				< 0.001
Less nicotine	234 (15.7)	185 (16.7)	49 (12.8)	
About the same amount of nicotine	245 (16.4)	182 (16.5)	63 (16.4)	
More nicotine	615 (41.3)	493 (44.6)	122 (31.8)	
Don't know	396 (26.6)	246 (22.2)	150 (39.1)	
Am confident I can quit waterpipe tobacco smoking				< 0.001
No	812 (54.5)	477 (43.1)	335 (87.2)	
Yes	678 (45.5)	629 (56.9)	49 (12.8)	
Quitting waterpipe tobacco smoking is:				< 0.001
Easy	409 (27.4)	396 (35.8)	13 (3.4)	
Difficult	663 (44.5)	350 (31.6)	313 (81.5)	
Don't know	418 (28.1)	360 (32.5)	58 (15.1)	
Have tried to quit waterpipe tobacco smoking before[c]				< 0.001
No	1194 (80.5)	845 (76.7)	349 (91.4)	
Yes	290 (19.5)	257 (23.3)	33 (8.6)	
Intend to quit waterpipe tobacco smoking				< 0.001
Not at all	537 (36.0)	261 (23.6)	276 (71.9)	
In the next month	12 (0.8)	11 (1.0)	1 (0.3)	
In the next 6 months	69 (4.6)	57 (5.2)	12 (3.1)	
In the future	872 (58.5)	777 (70.3)	95 (24.7)	

[a] *Chi-squared test.*

[b] *Percentages may not sum to 100% because of rounding.*

[c] *Contains some missing values, n = 1484.*

P-values < 0.05 indicate statistically significant differences between current waterpipe smokers who self-reported addiction to waterpipe tobacco smoking and those who did not.

Table 4 Univariate and multivariable logistic regression analyses of factors associated with self-reported addiction to waterpipe tobacco smoking

Variable	Univariate analysis		Multivariable logistic regression analysis			
	OR (95% CI)	*P*–value	β	SE	*P*-value	ORa (95% CI)
Age group (≥ 25 years)	2.3 (1.8–3.0)	< 0.001	0.000	0.218	0.999	1.0 (0.7–1.5)
Gender (male)	2.8 (1.6–4.9)	< 0.001	0.098	0.329	0.766	1.1 (0.6–2.1)
Education (vocational/university)	2.0 (1.5–2.5)	< 0.001	0.16	0.179	0.370	1.2 (0.8–1.7)
Occupation (professional/technical/skilled)	1.9 (1.5–2.5)	< 0.001	0.166	0.167	0.321	1.2 (0.9–1.6)
Marital status (married)	3.2 (2.4–4.3)	< 0.001	0.600	0.23	0.009	1.8 (1.2–2.9)
Current cigarette smoking (no)	1.3 (1.3–2.1)	< 0.001	0.219	0.139	0.114	1.3 (0.9–1.6)
Age at starting waterpipe tobacco smoking (< 18 years)	2.5 (2.0–3.2)	< 0.001	0.796	0.141	< 0.001	2.2 (1.7–2.9)
Frequency of smoking the waterpipe tobacco (daily)	7.2 (4.3–12.1)	< 0.001	0.677	0.299	0.024	2.0 (1.1–3.5)
Place where waterpipe tobacco smoked (at home)	1.8 (1.4–2.3)	< 0.001	0.428	0.251	0.087	1.5 (0.9–2.5)
Company when smoking the waterpipe tobacco(none, smokes alone)	2.3 (1.7–3.1)	< 0.001	0.689	0.17	< 0.001	2.0 (1.4–2.8)
Type of waterpipe tobacco smoked (unflavoured)	1.7 (1.2–2.3)	< 0.001	0.476	0.244	0.051	1.6 (1.0–2.6)
Source of waterpipe tobacco (self-purchase)	1.6 (1.3–2.1)	< 0.001	0.139	0.255	0.585	1.2 (0.7–1.9)
Monthly amount spent on waterpipe tobacco smoking (≥ 150 Egyptian pounds, US$ 8.6)	3.4 (2.6–4.3)	< 0.001	1.397	0.162	< 0.001	4.1 (2.9–5.6)
Constant			−4.758	0.379	< 0.001	0.009

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

tobacco smoking (Table 3). In addition, significantly more participants who self-reported addiction to waterpipe tobacco smoking than those who did not thought quitting waterpipe tobacco smoking would be difficult, and significantly fewer participants who self-reported addiction to waterpipe tobacco smoking than those who did not had ever attempted to quit. Furthermore, significantly more participants who self-reported addiction to waterpipe tobacco smoking had no intention of quitting waterpipe tobacco smoking compared with those who did not self-report addiction (Table 3).

Determinants of self-reported addiction to waterpipe tobacco smoking

Table 4 shows results of the univariate and multivariable logistic regression analyses. Of the variables tested in the multivariable analysis for their association with self-reported addiction to waterpipe tobacco smoking, the following were statistically significant independent determinants of self-reported addiction: younger age at starting waterpipe tobacco smoking (ORa = 2.2, 95% CI: 1.7–2.9), daily use of waterpipe tobacco (ORa = 2.0, 95% CI: 1.1–3.5), usually smoking the waterpipe alone (ORa = 2.0, 95% CI: 1.4–2.8), being married (ORa = 1.8, 95% CI: 1.2–2.9), and monthly spending on waterpipe tobacco smoking of ≥ 150 Egyptian pounds (US$ 8.6) (ORa = 4.1, 95% CI: 2.9–5.6) (Table 4).

Discussion

This study is among the few that have assessed self-reported addiction to waterpipe tobacco smoking. A quarter (25.8%) of current waterpipe smokers in the study self-reported addiction to waterpipe tobacco smoking. Compared with waterpipe smokers who did not consider themselves addicted to waterpipe tobacco smoking, those who self-reported addiction started smoking the waterpipe tobacco at a younger age, smoked it more frequently and in greater amounts, and were more likely to smoke the waterpipe tobacco at home or at work and smoke alone. Participants who self-reported addiction to waterpipe tobacco smoking also reported more difficulty to quit, lower self-efficacy, fewer quit attempts, less intention to quit and less perceived harm of waterpipe tobacco smoking. In addition, being married, and monthly spending of ≥150 Egyptian pounds (US$8.6) on waterpipe tobacco smoking were independent determinants of self-reported addiction to waterpipe tobacco smoking. However, waterpipe tobacco smoking was generally affordable for all current waterpipe smokers.

Only a few studies have explored dependence on waterpipe tobacco smoking using a direct question about self-reported addiction *(15,16)*. In line with the findings of this study, studies from The Syrian Arab Republic and the United States of America (USA) reported that the subjective perception of smokers of being addicted was

associated with higher frequency of waterpipe tobacco smoking *(15,16)*. Evidence of this association from other low- and middle-income countries that are experiencing an increase in waterpipe tobacco smoking is needed. There are features unique to waterpipe tobacco smoking that influence the development and manifestations of tobacco dependence *(1)*. Waterpipe smokers may not be aware of these features *(1)*. For example, a considerable proportion (28.1%) of waterpipe smokers in the present study simply did not know whether they were addicted to waterpipe tobacco. This is an important finding that reflects a lack of knowledge about the harms of waterpipe tobacco smoking which leads to uncertainty about the dependence waterpipe tobacco smoking can cause. Future or potential perceived addiction to waterpipe tobacco has been investigated in recent studies in young people in the USA and Lebanon *(17–19)*. Participants reported low perceived addictiveness of waterpipe tobacco smoking and low perceived chances of becoming addicted *(17–19)*.

Younger age at starting waterpipe tobacco smoking, daily waterpipe tobacco smoking, and usually smoking the waterpipe tobacco alone were independent determinants of self-reported addiction to waterpipe tobacco smoking in the current study. These findings are in line with earlier studies *(15,16,20,21)*. Another important finding of the present study is that waterpipe tobacco smoking is not intermittent or occasional, which was also found in recent Egyptian national and population-based surveys *(6,9)*. Furthermore, the transition from social waterpipe tobacco use to an individual pattern of use has been considered an indicator of waterpipe tobacco dependence *(1)*. Although none of the sociodemographic characteristics examined in this study independently determined self-reported addiction to waterpipe tobacco smoking, except for being married, previous qualitative studies in Egypt suggest waterpipe tobacco smoking is more widely and intensively done in rural settings *(22,23)*. Further investigations are needed to confirm whether there are other sociodemographic differences associated with self-reported addiction to waterpipe tobacco smoking.

Waterpipe tobacco smoking was generally affordable for all participants who were current waterpipe smokers. A mean monthly spending of ≥ 150 Egyptian pounds (US$ 8.6) on waterpipe tobacco smoking was the strongest independent determinant of self-reported addiction to waterpipe tobacco smoking. This finding has policy implications if we consider that a previous study in 2003–2004 found that current waterpipe smokers spent on average 8 Egyptian pounds (US$ 1.30) a month on waterpipe tobacco smoking *(24)*. The six-fold increase in spending over these 15 years may be due to increase in consumption (even when considering inflation and other factors). On the other hand, the taxation policy for waterpipe tobacco has not been scaled up to face this change in waterpipe tobacco smoking behaviour. Egypt implements the highest taxation measures recommended by the WHO for cigarettes. However, unfortunately, this successful policy is not implemented on waterpipe tobacco. According to the WHO report on the global tobacco epidemic 2019, the total tax on cigarettes (pack of 20) is 77.1%, while the total tax on a pack of waterpipe tobacco (20 g) is only 39.4% *(25)*.

Participants in the present study who self-reported addiction to waterpipe tobacco smoking thought it more difficult to quit, had lower self-efficacy (were not confident in their ability to quit), made fewer attempts to quit, had less intention to quit, and perceived less harm from waterpipe tobacco smoking than those who did not think they were addicted. Similar evidence has been reported in previous studies; most motivated waterpipe smokers who wanted to quit were unable to do so or had attempted to quit but had been unsuccessful *(1)*. These waterpipe smokers may show an indicator of tobacco dependence, which is failed efforts to reduce or control substance use. There was also an inverse relationship between perceived self-efficacy and perceived addiction to waterpipe tobacco smoking, a finding also reported in an earlier study *(15)*.

Tobacco control efforts have long neglected waterpipe tobacco smoking. Therefore, tobacco users instinctively associate smoking or the harms of smoking with cigarette smoking but not waterpipe tobacco smoking *(1)*. This is because waterpipe tobacco smoking is not highlighted as much as cigarettes in national tobacco control policies, whether in smoke-free policies, tobacco taxation or education interventions. This may have indirectly contributed to the misbeliefs that waterpipe tobacco smoking is less harmful, addictive and deadly than cigarette smoking.

This study had limitations. First, the cross-sectional study design and the non-random sampling limits the generalizability of results and it is not possible to attribute causality for the observed associations. Second, the measures assessed relied on self-reporting, which may be subject to social desirability and recall bias due to the administration of the interview survey. However, self-reports of smoking status have been argued to be valid (*26*). More importantly, self-reporting of dependence is an essential milestone in the behavioural change stages and in assessing a smoker's readiness to change. Third, no formal dependence measures or laboratory tests were used in this study which could have more accurately determine nicotine dependence. This was not feasible in the study design, hence the patterns of waterpipe tobacco smoking behaviour that are known to be associated with dependence were examined. In addition, standardized measures of waterpipe-specific dependence are still being developed, refined and tested for potential use in different cultures (*1,20,27*). Finally, this study did not address the length of the waterpipe tobacco smoking session. The length of session has been reported to be associated with progressive nicotine dependence in waterpipe smokers (*28*). Nonetheless, the relatively large sample in the different subgroups provided enough observations for comparisons to be made and may have minimized potential biases in the results.

Conclusion

Surveillance efforts should estimate the national prevalence of dependence on waterpipe tobacco to provide clarity on waterpipe tobacco-induced dependence. Comprehensive waterpipe-specific interventions, including education, taxation and cessation, are urgently needed. The fact that a considerable proportion of waterpipe smokers were uncertain whether they were addicted to waterpipe tobacco smoking highlights the need to more effectively disseminate evidence-based waterpipe-specific health education messages and incorporate this information in ongoing public health campaigns. The affordability of waterpipe tobacco smoking indicates the need to reform waterpipe-specific tobacco taxation, particularly as despite a six-fold higher monthly expenditure on waterpipe tobacco smoking compared with earlier reports, waterpipe smokers who self-identified as addicted to waterpipe tobacco smoking continued to smoke waterpipe tobacco. Strengthening cessation-seeking behaviour and interventions focusing on the complexity of perceived self-efficacy and perceived addiction to waterpipe tobacco smoking in all levels of health care services is another important policy approach to control tobacco use.

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Dépendance auto-déclarée et contrôle perçu du tabagisme par pipe à eau et comportements associés en Égypte : implications au niveau des politiques

Résumé

Contexte : Les études sur la dépendance au tabagisme par pipe à eau sont limitées.

Objectifs : La présente étude visait à évaluer la dépendance auto-déclarée au tabagisme par pipe à eau chez les fumeurs égyptiens et à identifier les facteurs sociodémographiques, le contrôle perçu et les comportements tabagiques associés.

Méthodes : Des enquêtes transversales ont été menées auprès d'adultes égyptiens en 2015 et 2017. les données sur 1490 fumeurs de pipe à eau, au moment de l'étude, ont été analysées, y compris les caractéristiques démographiques, le comportement tabagique du tabagisme par pipe à eau (âge au début de l'habitude, fréquence, quantité, compagnie, lieu du tabagisme et dépenses), les préjudices perçus de cette consommation ainsi que la dépendance auto-déclarée au tabagisme par pipe à eau et le contrôle perçu de ce type de tabagisme (capacité d'arrêter, difficulté à arrêter, tentatives d'arrêter et intention d'arrêter).

Résultats : Un quart (25,8 %) des participants ont déclaré une dépendance au tabagisme par pipe à eau (hommes 27,1 %, femmes 11,6 %). Ces participants ont déclaré avoir moins de confiance en leur capacité à arrêter de fumer, moins de tentatives de sevrage, moins d'intention d'arrêter et moins de préjudices perçus de cette consommation que ceux qui n'en étaient pas dépendants (p < 0,001). Les variables associées à la dépendance auto-déclarée étaient les suivantes : âge plus jeune au début de l'habitude du tabagisme par pipe à eau (odds ratio ajusté (ORa) = 2,2, intervalle de confiance à 95 % (IC à 95 %) : 1,7-2,9), tabagisme quotidien par pipe à eau (ORa = 2,0, IC à 95 % : 1,1-3,5), le fait de fumer seul (ORa = 2,0, IC à 95 % : 1,4-2,8), le fait d'être marié (ORa = 1,8, IC à 95 % : 1,2-2,9) et des dépenses mensuelles pour fumer des pipes à eau supérieures ou égales à 150 livres égyptiennes (8,6 USD) (ORa = 4,1, IC à 95 % : 2,9-5,6).

Conclusions : Il est nécessaire de mettre en place des interventions politiques de grande envergure, notamment des programmes d'éducation sur la dépendance au tabagisme par pipe à eau, une taxation accrue pour réduire l'accessibilité financière du tabac pour pipe à eau et des programmes de sevrage tabagique traitant de l'auto-efficacité perçue et la dépendance au tabagisme par pipe à eau.

إدمان تدخين تبغ النرجيلة المُبلَغ عنه ذاتياً والعوامل ذات الصلة في صفوف مُدخِّني النرجيلة الحاليين في مصر

آية مصطفى

الخلاصة

الخلفية: الدراسات التي أُجريت بشأن إدمان تدخين تبغ النرجيلة محدودة.

الأهداف: هدفت هذه الدراسة إلى تقييم حالات إدمان تدخين تبغ النرجيلة المُبلَغ عنها ذاتياً في صفوف مُدخِّني النرجيلة المصريين البالغين، وتحديد العوامل الاجتماعية والسكانية ذات الصلة والسلوكيات والمعتقدات المتعلقة بالتدخين.

طرق البحث: أُجريت في عامي ٢٠١٥ و٢٠١٧ دراسات استقصائية شاملة لعدة قطاعات على مصريين بالغين. وجرى تحليل بيانات ١٤٩٠ شخصاً من مُدخِّني النرجيلة الحاليين، بما في ذلك: الخصائص الاجتماعية والسكانية، والتعرض لدخان التبغ في المنزل، وسلوكيات تدخين السجائر والنرجيلة (مثل السن في بداية التدخين، ومعدل التكرار، ومقدار التدخين ومكانه، والشركة والنفقات)، وإدراك الأضرار، ومكافحة تدخين النرجيلة (القدرة على الإقلاع عن التدخين، وصعوبة الإقلاع، ومحاولات الإقلاع السابقة، ونية الإقلاع). وأجري تحليل انحدار لوجستي متعدد المتغيرات، وأُبلغ عن نسب أرجحية مُصحَّحة وعن فترات ثقة قدرها ٩٥٪.

النتائج: أبلَغ ربعُ (٨ , ٢٥٪) مدخني النرجيلة الحاليين إبلاغاً ذاتياً عن إدمانهم تدخين تبغ النرجيلة (١ , ٢٧٪ من الرجال و٦ , ١١٪ من النساء). وفيما يلي المتغيرات التي كانت مرتبطة على نحو مستقل بما أُبلغ عنه ذاتياً من إدمان تدخين النرجيلة: بدء تدخين النرجيلة في سن صغيرة (نسبة الأرجحية المُصحَّحة = ٢ , ٢، فترة ثقة ٩٥٪: ٧ , ١–٩ , ٢)، وتدخين النرجيلة يومياً (نسبة الأرجحية المُصحَّحة = ٠ , ٢، فترة ثقة ٩٥٪: ١ , ١–٥ , ٣)، وتدخين النرجيلة وحدها في الغالب (نسبة الأرجحية المُصحَّحة = ٠ , ٢، فترة ثقة ٩٥٪: ٤ , ١–٨ , ٢)، والزواج (نسبة الأرجحية المُصحَّحة = ٨ , ١، فترة ثقة ٩٥٪: ٢ , ١–٩ , ٢)، وإنفاق ١٥٠ جنيهاً مصرياً (٦ , ٨ دولار أمريكي) أو أكثر على تدخين النرجيلة شهرياً (نسبة الأرجحية المُصحَّحة = ١ , ٤، فترة ثقة ٩٥٪: ٩ , ٢–٦ , ٥).

الاستنتاجات: نسبة كبيرة من مُدخِّني النرجيلة أبلغوا ذاتياً عن إدمانهم تدخين النرجيلة. وتدعو الحاجة إلى وجود تدخلات سياساتية واسعة النطاق خاصة بالنرجيلة، بما في ذلك تثقيف الناس بشأن إدمان تدخين النرجيلة، وزيادة الضرائب لتقليل القدرة على شراء تبغ النرجيلة، وبرامج الإقلاع عن التدخين.

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Socioeconomic inequality in smoking and its determinants in the Islamic Republic of Iran

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Abstract

Background: The role of socioeconomic inequality and related factors has not been well reported in tobacco consumption.

Aims: To investigate the socioeconomic inequality in smoking and its associated factors in the Islamic Republic of Iran.

Methods: Data were collected from surveillance for noncommunicable diseases in 2005, which included 89 404 people aged 15–65 years. Economic status was defined by principal component analysis on variables related to socioeconomic status. Concentration index and slope index of inequality were used to determine the inequality value. The gap between the high and low economic status groups was decomposed using the Oaxaca–Blinder decomposition method for explained and unexplained components.

Results: The total prevalence of smoking was 17.0%; 28.0% in males, and 5.8% in females, 15.8% in urban and 19.1% in rural areas. The concentration index was −0.032 in the whole of country; −0.098, in males, −0.246 in females, 0.014 in urban and −0.059 in rural areas and varied in different provinces of country. The smoking rate was 18.0% for the first quintile and 13.5% for the fifth quintile, a gap of 4.5%. The major part of this gap was related to differences in education level, sex, marital status and age in economic groups.

Conclusion: There was a pro-rich socioeconomic inequality in smoking, especially in females and in the southern provinces. Increase in education level and empowering females of low socioeconomic status are sound interventions for alleviating inequality and for tobacco control.

Keywords: smoking; health status disparities; inequality; Iran; socioeconomic factors

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Introduction

Tobacco consumption accounts for more than 7 million deaths annually. About 80% of smokers live in low- and middle-income countries (*1*). Previous studies have shown that the prevalence of smoking is higher among low-income and low-educated individuals (*2–6*). In 2008, the World Health Organization (WHO) categorized health disparities as a political agenda at local, regional, and national levels and made recommendations for this issue (*7*). In this report the accurate determination of the problem and the evaluation, monitoring and surveillance of inequality, both nationally and internationally, were emphasized (*7*); WHO even provided resources for examining national inequalities (*8*). However, in many low- and middle-income countries (and even in some high-income countries) there is no comprehensive national system for monitoring health inequalities (*9*). All societies today have socioeconomic inequalities and some degree of social gradient in health. This gradient should make us more aware of these inequities and of policy-making to address them; consider the determinants of inequality such as literacy (*10*); and even look politically at the inequalities (*11*).

Among people with low income or low literacy, smokers have a greater risk of death from chronic illness and tuberculosis (*12*). The relationship between tobacco control and equity is partly linked to the alleviation of poverty and the development of countries. In fact, many wealthy people in high-income societies have stopped smoking and do not socially accept this behaviour, while in low-income societies smoking is socially accepted and has a steady or growing status (*12*).

Previous studies in Thailand (*13*), India (*14*), Germany (in middle age) (*15*) and Indonesia (*16*) have shown that smoking is more frequent in low socioeconomic status or low-income groups. Even smoking cessation treatments were less used in groups with low socioeconomic status (*15,17,18*). World Health Survey data from 48 low- and middle-income countries demonstrated that, in many countries, smoking is more common in low-income groups among males. Among females, it was both pro-rich (in 20 countries) and pro-poor (in 9 countries) (*6*). A limited number of studies also determined the causes of inequality in smoking (*19–22*), mostly using the decomposition of concentration index. As far as we know, there has been no study or comparison of this issue in the

Islamic Republic of Iran across the different provinces. Our study reports on the factors relating to inequality in smoking employing a sample of adequate size in the Islamic Republic of Iran and its provinces.

Methods

The Ministry of Health and Medical Education established surveillance systems for noncommunicable diseases throughout the country in 2005. The first round of this surveillance was conducted in the same year with the participation of 89 404 people. The participants were selected from all provinces using a systematic approach and a multi-stage cluster sampling method (*23*). The questionnaire used in this project was designed according to the WHO STEPwise approach. In this questionnaire 8 questions measured the socioeconomic status of participants, including type of home ownership, number of rooms, car ownership, number of trips in the past year, marital status, education level and primary job. Principal component analysis was performed on these questions, including 29 dummy, continuous and ordinal variables. The factors with an eigenvalue > 1 (16 variables) covered 78.07% of variance. House ownership, occupation status, residence (urban/rural) and education level were the main significant variables with a high eigenvalue in the principal component analysis model. A new socioeconomic variable was constructed from the sum of the asset variables, weighted by the first eigenvector. The participants were then divided into 5 quintiles based on this new variable (*24*).

To estimate inequality, the prevalence of smoking was compared in socioeconomic quintiles and the concentration index and slope index for inequality (SII) were calculated. This method has already been used to examine socioeconomic inequality in hypertension (*25*) and obesity (*26*), and details of these methods are presented in those reports. People who currently smoke in any form (including cigarette, pipe, waterpipe) in any amount were considered smokers.

The gap between the 2 high and low socioeconomic status groups was divided into explained and unexplained components using the Oaxaca–Blinder decomposition method (*27,28*). The explained component defines the difference in the independent variables between the 2 groups and the unexplained component is related to the difference in the effect of these variables between these 2 groups.

In all tests, the significance level was 0.05, and the effect of cluster sampling was considered in calculating the confidence interval by using the "svy" command in Stata software (*29*). The distribution map of inequality was prepared using ArcGIS software (*30*).

Results

Of the 89 404 people in the study, the smoking history was available for 87 240, and analyses were carried out on these participants: 50.2% were males, 64.9% lived in urban areas, mean age was 39.3 years and the age range was 15–65 years. The mean age of smokers was 43.6 years and for non-smokers was 38.4 years. The difference was statistically significant ($P < 0.001$).

The prevalence of smoking was 17.0% overall, 28.0% in males and 5.8% in females. In urban areas prevalence was 15.8% and in rural areas 19.1%. The prevalence of smoking varied in different provinces: those recording the lowest prevalence were Ilam (10.0%), Yazd (10.6%) and Golestan (11.2%); those with the highest prevalence were the southern provinces of Bushehr (29.7%), Sistan and Baluchestan (24.4%), Kohgiluyeh and Boyer-Ahmad (21.9%), and Hormozgan (21.5%) (Table 1).

The status of socioeconomic inequality differed greatly between provinces. The concentration index was negative in Hormozgan (–0.209) and Bushehr (–0.201), indicating a significant inequality in favour of people with high socioeconomic status, and was close to zero in provinces such as Semnan (–0.001), Qom (0.005) and East Azarbaijan (0.006), indicating an absence of inequality, however, it was positive in Tehran (0.091) and Mazandaran (0.079), indicating a slight inequality in favour of individuals with low socioeconomic status (Figure 1).

These provincial differences caused the concentration index for the country as a whole to be non-significant (–0.032) (Table 1). The SII value also shows the same situation in absolute terms. In terms of this index, the least inequality was in East Azarbaijan province and the highest was in Bushehr province. The SII value was –0.72 for the whole country, which is not significant when considering the 95% confidence interval (–4.0–2.5).

The smoking situation in various socioeconomic groups was different in different provinces (Table 1). The prevalence of smoking in the first quintile was 6.6% in Tehran province and 32.8% in Hormozgan. The prevalence of smoking in the fifth quintile was 8.2% in Yazd province and 18.8% in Sistan and Baluchistan.

Figure 2 shows the status of the concentration index in terms of smoking prevalence and suggests that as the prevalence of smoking increases, the concentration index switches from positive and close to zero values to negative values. Figure 3 shows the concentration curves of smoking according to sex. Both curves are above the 45 degree line, meaning unequal distribution of smoking in favour of high socioeconomic groups. The inequality was greater in women.

The total value of the concentration index was negative–0.032 [95% confidence interval (CI): –0.023, –0.041], meaning that inequality was at the expense of people of low socioeconomic status and concentrated in this group of society. The concentration index was –0.098 (95% CI: –0.089, –0.106), in men –0.246 (95% CI: –0.225, –0.267) in women, 0.014 (95% CI: 0.025, 0.003) in urban areas and –0.059 (95% CI: –0.045, –0.072) in rural areas. It can be said that the women smokers are generally concentrated in disadvantaged groups.

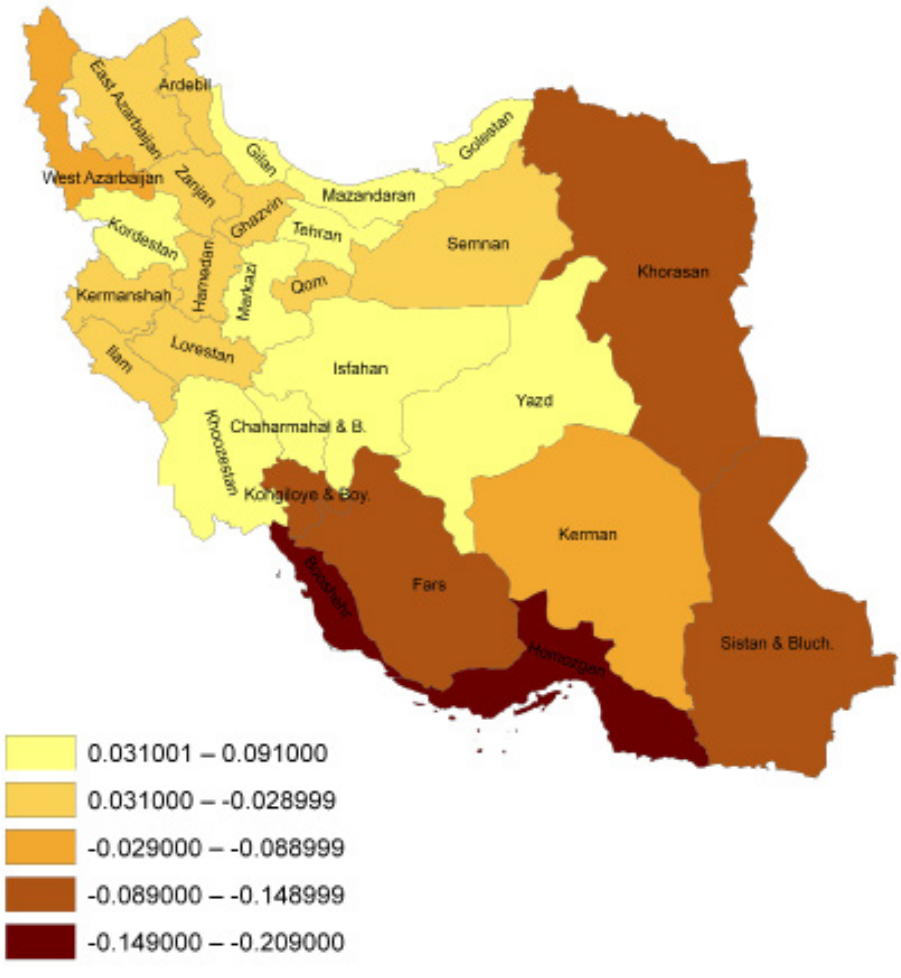
The prevalence of smoking was 18.0% in the first quintile of socioeconomic status and 13.5% in the fifth quintile, a gap of 4.5% (Table 2). The major portion of

Table 1 Socioeconomic inequality in smoking prevalence in all provinces, Islamic Republic of Iran, 2005

Province	Socioeconomic status (quintile)						SII (95% CI)	Concentration index
	Overall	Q1	Q2	Q3	Q4	Q5		
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)		
East Azar.	14.9 (13.5–16.3)	14.5 (12.2–16.7)	13.4 (10.6–16.2)	17.4 (14.3–20.5)	15. 9 (13.2–18.7)	13.1 (10.1–16.1)	0.1 (–10.7 to 10.8)	0.006
West Azar.	20.2 (18.7–21.7)	21.3 (18.6–24.1)	19. 9(16.7–23.1)	19.4 (16.3–22.6)	22.1 (18.8–25.5)	15.3 (12.5–18.1)	4.4 (–16.7 to 25.4)	–0.036
Ardebil	17.5 (16.0–19.0)	17.5 (14.7–20.2)	14.4 (11.4–17.4)	24.1 (20.1–28.1)	19.8 (15.7–23.9)	10.3 (7.1–13.6)	–3.9 (–34.9 to 27.1)	–0.017
Isfahan	14.3 (13.1–15.5)	9.0 (6.5–11.5)	12.3 (10–14.7)	16.4 (13.9–19.0)	19.3 (16.4–22.1)	12.0 (9.4–14.5)	2.6 (–11.0 to 16.1)	0.062
Ilam	10.0 (9.0–11.1)	9.6 (7.2–12.0)	9.1 (6.6–11.5)	11.1 (8.2–14.0)	12.3 (8.9–15.6)	8.3 (5.0–11.6)	0.4 (–9.0 to 9.7)	0.010
Bushehr	29.7 (27.3–32.0)	44.0 (38.8–49.2)	38.0 (34.0–42.0)	25.9 (22.1–29.7)	22.3 (19.2–25.4)	13.8 (11.0–16.6)	–29.0 (–46.7 to –11.3)	–0.201
Tehran	16.2 (15.4–17.0)	6.6 (4.8–8.4)	10.2 (8.5–12.0)	16.7 (14.8–18.6)	20.7 (19.0–22.3)	16.5 (15.1–17.9)	6.8 (–8.4 to 22.0)	0.091
Ch. Mahal	15.1 (13.7–16.9)	12.1 (9.8–14.4)	13.8 (10.6–17.0)	19.6 (16.8–22.4)	23.2 (20.0–26.4)	10.3 (7.1–13.6)	–5.6 (–34.2 to 23.1)	0.063
Khorasan	18.7 (17.3–20.2)	24.2 (21.2–27.1)	20.1 (16.9–23.4)	18.3 (15.6–21.1)	16.9 (14.4–19.5)	13.7 (11.5–1.6)	–13.6 (–16.4 to –10.8)	–0.101
Khozestan	15.3 (13.7–16.9)	11.7 (8.6–14.8)	15.3 (12.8–17.7)	18.0 (15.9–20.2)	18.1 (14.6–21.6)	13.3 (10.3–16.4)	7.6 (–5.3 to 20.0)	0.034
Zanjan	15.0 (13.5–16.5)	15.4 (13.6–17.1)	15.3 (12.3–18.4)	13.6 (10.7–16.5)	17.7 (13.9–21.5)	12.3 (8.8–15.9)	6.1 (–12.4 to 24.5)	–0.021
Semnan	13.0 (11.8–14.2)	12.3 (8.9–15.7)	13.6 (10.3–16.9)	11.9 (9.7–14.1)	16.3 (13.4–19.3)	11.0 (8.6–13.4)	–5.2 (–16.7 to 6.4)	–0.001
Sistan & B.	24.4 (22.1–26.7)	29.8 (26.6–33.0)	22.8 (17.9–27.8)	19.9 (14.5–25.3)	20.8 (17.0–24.6)	18.8 (14.8–22.9)	–2.8 (–27.6 to 22.1)	–0.108
Fars	20.5 (18.8–22.2)	28.7 (24.0–33.3)	19.8 (16.6–23.0)	19.5 (16.7–22.3)	20.3 (17.2–23.3)	13.2 (10.4–15.9)	–12.2 (–23.4 to –1.0)	–0.123
Qazvin	16.6 (15.2–18.0)	16.8 (13.3–20.3)	10.5 (7.4–13.7)	20.3 (16.2–24.4)	20.9 (17.6–24.3)	14.6 (10.8–18.3)	3.1 (–21.4 to 27.5)	0.020
Qom	12.4 (10.8–14.0)	11.1 (7.0–15.1)	11.2 (8.4–14.1)	14.8 (11.6–18.1)	15.0 (11.6–18.3)	9.5 (6.8–12.1)	0.2 (–13.3 to –13.8)	0.005
Kordestan	17.4 (16.0–18.8)	14.2 (11.6–16.8)	19.6 (16.3–22.9)	22.3 (18.9–25.8)	19.4 (15.5–23.2)	15.5 (12.8–18.2)	0.8 (–12.9 to14.5)	0.045
Kerman	18.9 (17.1–20.7)	22.3 (18.5–26.0)	17.6 (14.7–20.6)	22.0 (17.4–26.5)	16.5 (14–19.1)	14.2 (12.3–16.1)	–2.2 (–17.8 to 13.4)	–0.087
Kermanshah	15.2 (13.7–16.7)	15.5 (13.2–17.9)	15.2 (11.3–19.0)	16.7 (13–20.5)	16.0 (12.8–19.2)	12.1 (9.2–14.9)	5.9 (–12.1 to 23.9)	–0.023
Koh. & Boyer	21.9 (19.5–24.2)	26.6 (22.1–31.0)	23.5 (19.7–27.3)	22.2 (17.2–27.2)	22.1 (17.9–26.3)	14.2 (11.0–17.4)	1.8 (–28.1 to 31.6)	–0.097
Golestan	11.2 (9.7–12.6)	9.1 (6.1–12.1)	11.1 (8.5–13.8)	11.4 (8.9–13.9)	15.1 (11.5–18.6)	9.1 (6.4–11.8)	2.3 (–10.8 to 15.4)	0.041
Gilan	17.8 (16.1–19.6)	14.2 (9.8–18.6)	14.5 (10.7–18.2)	18.1 (14.8–21.5)	23.4 (19.9–26.9)	16.7 (13.3–20.1)	–1.4 (–19.6 to 16.8)	0.062
Lorestan	18.4 (17.0–19.8)	16.3 (12.4–20.1)	21.8 (17.6–2.6)	19.7 (15.2–24.2)	23.1 (19.4–26.8)	12.0 (8.6–15.4)	–3.5 (–30.0 to 22.9)	–0.019
Mazanderan	14.2 (13.0–15.4)	9.2 (7.3–11.1)	13.4 (10.7–16.1)	15.1 (12.7–17.5)	19.4 (16.4–22.4)	12.8 (10.4–15.2)	1.4 (–13.0 to 15.9)	0.079
Markazi	17.8 (16.4–19.3)	15.7 (12.8–18.7)	13. 9 (10.5–17.4)	22.8 (19.3–26.3)	22.2 (18.5–2.6)	15.1 (11.8–18.4)	3.6 (–20.4 to 27.5)	0.034
Hormozgan	21.5 (19.6–23.4)	32.8 (27.6–38.1)	24. 9 (21.4–28.4)	17.0 (13.9–20.2)	15. 9 (11.9–20.0)	11.9 (9.0–14.7)	–11.6 (–42.6 to 19.4)	–0.209
Hamedan	18.4 (16.7–20.1)	18.6 (15.6–21.7)	15.4 (11.9–18.9)	23.2 (18.8–27.6)	22.7 (18.7–26.7)	13.8 (10.4–17.3)	–7.6 (–28.3 to 13.2)	–0.015
Yazd	10.6 (9.2–12.1)	8.1 (4.2–12.1)	7.6 (4.9–10.4)	13.9 (11.6–16.2)	13.8 (10.7–16.9)	8.2 (5.3–11.2)	3.0 (–13.6 to 18.3)	0.046
Iran (total)	17.0 (16.6–17.3)	18.0 (17.2–18.8)	16.0 (15.3–16.7)	17.9 (17.3–18.5)	19.1 (18.5–19.7)	13.5 (13.0–14.1)	–0.7 (–4.0 to 2.5)	–0.032

SII = slope index for inequality; CI = confidence interval.

Figure 1 Concentration index of smoking in the provinces of the Islamic Republic of Iran, 2005



this gap was accounted for by the difference in the independent variables such as age and literacy (explained component): the mean years of education was 1.3 in the first socioeconomic quintile and 4.2 in the fifth quintile and the prevalence of smoking was higher in illiterate and less-educated individuals.

The share of the explained component is positive, which means that these differences are in favour of the high socioeconomic group, while the difference in the influence of these independent variables (unexplained component) was –2.7 and was in favour of the low socioeconomic group.

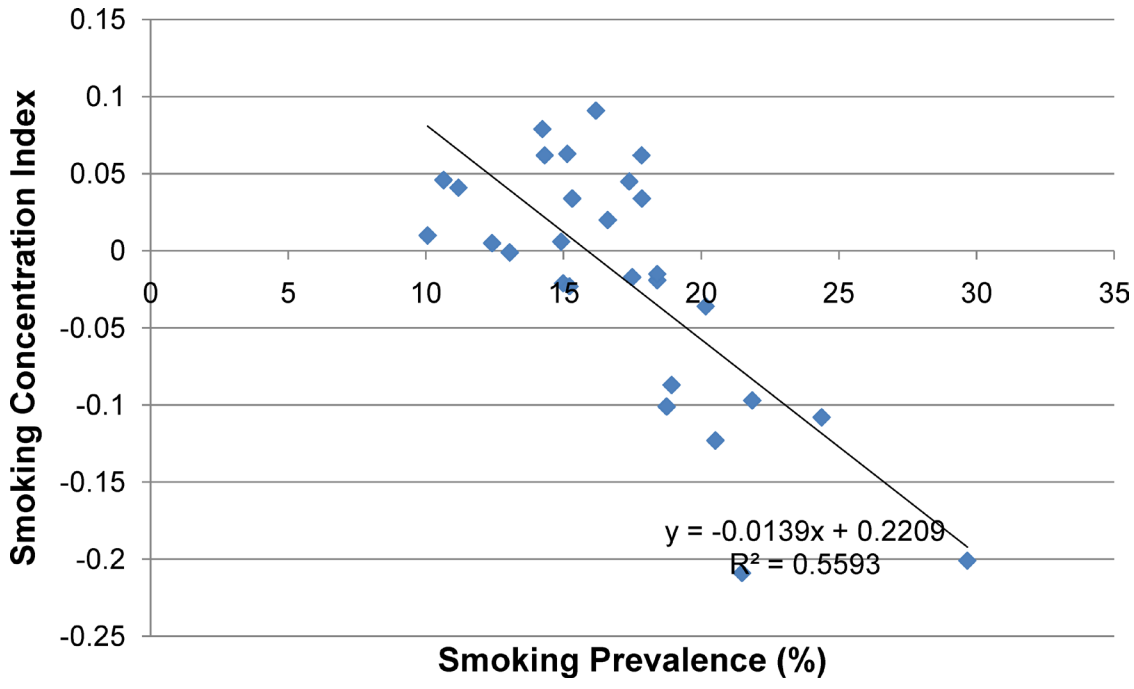
Discussion

The results of this study showed that there was a spectrum of socioeconomic inequality in smoking in the Islamic Republic of Iran. In some provinces, the concentration index was negative and inequality was in the favour of the high socioeconomic people; there was no significant inequality in some provinces; and the concentration index was positive and inequality was in favour of people of low socioeconomic status in some provinces.

The 2 theories of health selection and social causation play an important role in creating inequalities. In the theory of health selection, the changes in the health status lead to alterations in social status and healthier people have suitable social situations. The theory of social causation emphasizes that having a higher socioeconomic status has a better effect on health (*29*).

In a study of inequality in 48 low- and middle-income countries, the prevalence of smoking in men with lower incomes was higher in most countries, sometimes 2.5 times higher than in the rich ones (*6*). The pattern in women differed in that it was pro-rich in 20 countries, meaning that smoking was more frequent in females with lower incomes, and in 9 countries it was more frequent in wealthy women. Several local studies have examined the status of inequality in smoking. One of these evaluated 1064 high school students in Zanjan: the concentration index for regular smoking was –0.10 and the household economic status had the most important role in this inequality (*30*). A study in Kurdistan reported significant inequality in smoking in 2005 and 2009 (*21*). In Shahroud, the concentration index for smoking was

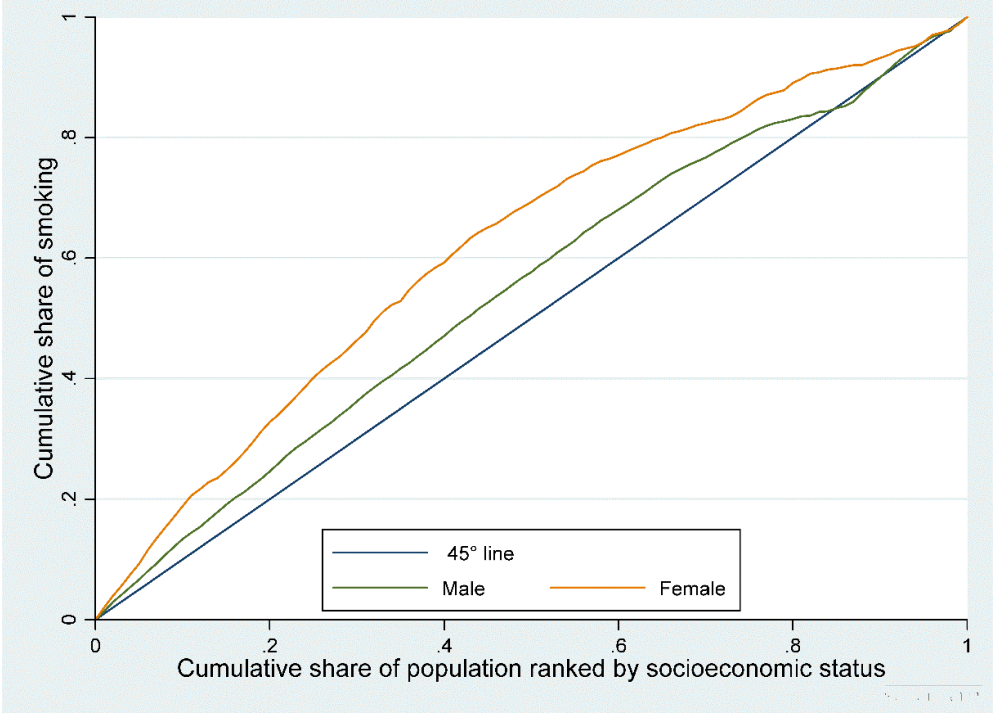
Figure 2 The relationship between inequality and prevalence of smoking, Islamic Republic of Iran, 2005



−0.191 (*19*). The differences in inequality in these studies can be attributed not only to the differences in inequality in the different provinces (also seen in the current study) but also to differences in the year of study, the target population and the selection of variables to measure the economic situation.

According to our findings, the increasing prevalence of smoking not only increases inequality but also moves away from focusing on advantaged individuals and concentrates on disadvantaged people. Additionally, we found that inequality was greater and the concentration index negative in the southern and eastern provinces.

Figure 3 The concentration curves for smoking among males and females in the Islamic Republic of Iran, 2005



These provinces are more susceptible to smuggling, and this, coupled with the lower economic status of these provinces, probably leads to increased prevalence of smoking, especially among disadvantaged people. The relationship of people in the southern provinces with the Arab countries around the Persian Gulf (which have a higher prevalence of smoking) also contributes to the increased prevalence of smoking in these provinces.

Greater levels of deprivation in southern and eastern provinces have also contributed to the greater socioeconomic inequality in smoking. Similarly, research has shown that people in lower socioeconomic or lower income groups had a higher prevalence of smoking in the Czech Republic (*31*), in most districts of Korea (*32*), and among Indonesian teenagers (*16*). However, the prevalence of smoking was higher in Chinese males in the upper income rather than the low income group (*33*); in another Chinese study, the concentration index was 0.044 and tobacco consumption was concentrated in rich people (*22*). Therefore, it can be said that in other societies the inequality in smoking also differs depending on the prevalence of smoking and other factors, including per capita income. For example, a survey among adolescents aged 13–15 years in 63 low- and middle-income countries found that the prevalence of smoking increased with increasing GDP and the likelihood of smoking among youth was greater in countries with greater wealth inequality (*34*).

The results of decomposition of the gap between the low and high socioeconomic groups for smoking indicated that the main factors related to the differences in age, sex, education, residence and marital status between these socioeconomic groups. Among these variables, education had the greatest role and accounted for 64% (4.6/7.2) of the explained component. Further analysis showed that the mean years of education was much lower in the first socioeconomic quintile than in the fifth quintile and the prevalence of smoking was higher in illiterate and less-educated individuals. Indeed, if the education of disadvantaged people becomes equal to that of advantaged ones, a large proportion of the inequality will be eliminated. Other studies have pointed to the role of education in smoking.

For example, smoking was more common in less-educated individuals in India (*3,14*) and China (*33*). In Switzerland, the less-educated individuals also had a higher prevalence of smoking and a lower quit ratio (*35*). World Health Survey data in 50 low- to upper-middle income nations showed that increased education was strongly associated with a reduction in smoking, especially in young men, and the gap between educated and less-educated youth increased with growth in GDP. In women, the relationship between smoking and education was weaker (*36*). Data from 2004–2012 in 4 countries also revealed that smoking was more common in men in low educated groups in Lebanon, Palestine and the Syrian Arab Republic (*37*). Cross-sectional studies in Germany (*38*) and the United States (*39*) reported that, although there was a decreasing trend in smoking, this decline was only observed in groups with high and moderate education levels and did not change significantly in lower educated groups. In 4 European countries, United Kingdom, Finland, Lithuania and the Netherlands, it is anticipated that the prevalence of smoking will be reduced by 2050, but this decline will occur mainly in the more advantaged groups, and inequality in education will increase the prevalence of smoking (*40*). In a survey in 49 countries, the prevalence of smoking was higher in higher-educated women aged over 45 in Eastern Europe and the Eastern Mediterranean (positive gradient), while this was the reverse in young females (*4*). The results of the above studies emphasize that in most societies, better education especially at younger ages, is associated with a lower smoking prevalence.

The next factor in creating inequality was sex, the impact of which was in favour of disadvantaged people, unlike other factors under investigation. The reason for this was that females with a lower prevalence of smoking (5.8%) than males (28.0%) were often found in the first socioeconomic quintile (66.6%) rather than the fourth (28.9%) and the fifth (43.1%). Attention to empowerment, income and education of females in low socioeconomic groups is an important strategy for reducing inequality. World Health Survey data showed that globally the prevalence of smoking was 40% in males and 12% in females in all societies. The lowest prevalence (4%) was found in Eastern Mediterranean females (*36*). In almost all countries, smoking is more common in poor males compared with rich males, while in females due to the increasing trend of smoking, different scenarios exist in different regions. The causes of the higher prevalence of smoking in poor people are complex and require further study.

Marital status was the next associated factor in the gap between the 2 groups for smoking. Further analysis showed that smoking prevalence was 19.8% in married and 8.4% in non-married (single, deceased spouse, divorced) people. On the other hand, 8.1% of the first quintile and 47.5% of the fifth quintile (who were younger people) were non-married participants. Contrary to these results, a study in China showed that the smoking prevalence and the number of cigarettes smoked were greater in singles, widowed and divorced participants (*22*). In addition to cultural differences, the main reason for this difference may be the age of people in various socioeconomic groups. In the present study, the age of the individuals was older in the lower quintiles, and therefore the percentage married was greater than in the other quintiles. It should be noted that what is seen in Table 2, as the association of different variables, is adjusted with the influence of other variables, including age. In other words, it can be said that marital status is also associated with smoking, independently of the age difference of people in different socioeconomic groups. In order to reduce inequality, further attention should be paid to non-married groups.

The age difference of various socioeconomic groups generated 31% of the gap between the 2 groups in the

Table 2 Decomposition of the gap in smoking prevalence between the first and fifth quintiles of socioeconomic status, Islamic Republic of Iran, 2005

Smoking	Prediction (%)	95% CI		P
Prevalence in first quintile	18.0	17.4	18.5	< 0.001
Prevalence in fifth quintile	13.5	13.1	14.0	< 0.001
Differences (total gap)	4.5	3.7	5.1	<0.001
Differences due to endowments (explained)a				
Age	2.2	1.6	2.7	< 0.001
Education	4.6	3.8	5.3	< 0.001
Sex (male = 0, female = 1)	−3.6	−3.9	−3.3	< 0.001
Living area (urban = 0, rural = 1)	0.6	0.2	1.0	0.002
Marital status	3.3	2.8	3.8	< 0.001
Sub-total gap	7.2	6.4	8.0	< 0.001
Differences due to coefficients (unexplained)b				
Age	−64.6	−2.1	8.0	0.381
Education	6.4	−10.0	22.3	0.447
Sex	15.7	−21.5	5.3	0.408
Living area	4.2	−6.0	14.4	0.423
Marital status	6.2	−8.3	20.8	0.400
Constant	29.4	−44.6	103.3	0.436
Sub-total gap	−2.7	−3.5	−2.0	< 0.001

[a]*Part of gap that related to differences in independent variables between two groups.*

[b]*Part of gap that related to differences of regression coefficients (βs) in two groups.*

CI = confidence interval.

explained section. The cause of this association is that older people were in lower and younger people were in higher socioeconomic groups, and, as in other research (*41*), the mean age of the smokers was statistically significantly higher than that of the non-smokers. The message here is that to reduce inequality, new interventions for poverty alleviation and smoking cessation should focus especially on older people.

Residence had the smallest role in creating a gap between the 2 groups. The rural areas not only had a higher prevalence of smoking than urban areas but also had an absolute concentration index greater than urban areas (more inequality) and a negative concentration index, in contrast to urban areas. In the United States of America, despite the decline in smoking, it was more prevalent in less-educated people and in rural areas (*39,42,43*). A higher prevalence of smoking in rural areas of China has also been reported (*44*).

The large sample size, the use of a national questionnaire and the gathering of information accurately and with monitoring and the use of accurate statistical methods for defining and decomposition of inequality were some of the strengths in this study. However, it should be mentioned that the study data were from 2005, and further longitudinal studies are necessary to understand the current situation. In interpreting the results, it should be noted that the observed relationships in this cross-sectional study had no causal aspect and only showed the relationships between variables.

Conclusion

There was a socioeconomic inequality in smoking in the Islamic Republic of Iran and most of its provinces. This inequality was in favour of advantaged people, very prominent in women and was greater in rural areas compared with urban areas. A higher prevalence of smoking enhanced the inequality and concentrated it in low socioeconomic groups. Education, sex, marital status and age were the main factors associated with this inequality, and these should be considered when developing tobacco control interventions.

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Competing interests: None declared.

Inégalités socio-économiques liées au tabagisme et leurs déterminants en République islamique d'Iran

Résumé

Contexte : Le rôle des inégalités socio-économiques et des facteurs connexes n'a pas été bien décrit dans la consommation de tabac.

Objectifs : Étudier les inégalités socio-économiques liées au tabagisme et les facteurs qui y sont associés en République islamique d'Iran.

Méthodes : En 2005, des données ont été collectées par le biais de la surveillance des maladies non transmissibles impliquant 89 404 personnes âgées de 15 à 65 ans. Le statut économique a été défini par l'analyse en composantes principales des variables liées au statut socio-économique. L'indice de concentration et l'indice de pente de l'inégalité ont été utilisés pour déterminer la valeur de l'inégalité. L'écart entre les groupes de statut économique élevé et faible a été décomposé à l'aide de la méthode de décomposition Oaxaca-Blinder pour les composantes expliquées et inexpliquées.

Résultats : La prévalence totale du tabagisme était de 17,0 % ; 28,0 % chez les hommes et 5,8 % chez les femmes, 15,8 % en milieu urbain et 19,1 % en milieu rural. L'indice de concentration était de - 0,032 dans l'ensemble du pays ; - 0,098 chez les hommes, - 0,246 chez les femmes, - 0,014 en milieu urbain et - 0,059 en milieu rural et variait selon les provinces du pays. Le taux de tabagisme était de 18,0 % pour le premier quintile et de 13,5 % pour le cinquième quintile, soit un écart de 4,5 %. La majeure partie de cet écart était liée aux différences de niveau de scolarité, de sexe, d'état civil et d'âge dans les groupes économiques.

Conclusions : Il y avait une inégalité socio-économique en faveur des riches dans le tabagisme, en particulier chez les femmes et dans les provinces du sud. L'augmentation du niveau d'éducation et l'autonomisation des femmes de faible statut socio-économique sont des interventions judicieuses pour réduire les inégalités et lutter contre le tabagisme.

عدم المساواة الاجتماعية والاقتصادية في التدخين ومحدداتها في جمهورية إيران الإسلامية

محمد حسن إماميان، منصورة فاتح،أكبر فتوحي

الخلاصة

الخلفية: إن دور عدم المساواة الاجتماعية والاقتصادية في استهلاك التبغ والعوامل المرتبطة بذلك لم يتم الإبلاغ عنها جيداً.

الأهداف: هدفت الدراسة إلى التحري بشأن عدم المساواة الاجتماعية والاقتصادية في التدخين والعوامل المرتبطة بذلك في جمهورية إيران الإسلامية.

طرق البحث: جُمعت البيانات من خلال ترصد الأمراض غير السارية في عام ٢٠٠٥؛ بمشاركة ٨٩٤٠٤ أشخاص تتراوح أعمارهم بين ١٥–٦٥ عاماً. وتحدد الوضع الاقتصادي من خلال تحليل المكونات الرئيسية بشأن المتغيرات المرتبطة بالوضع الاجتماعي والاقتصادي. واستُخدم مؤشر التركيز ومؤشر انحدار عدم المساواة لتحديد قيمة عدم المساواة. وحُللت الفجوة بين فئتي الوضع الاقتصادي المرتفع والمنخفض باستخدام طريقة تحلل أواكساكا – بليندر بالنسبة للمكونات المُفسرة وغير المُفسرة.

النتائج: بلغ معدل انتشار التدخين ٠ , ١٧٪، بنسبة ٠ , ٢٨٪ بين الرجال، و٨ , ٥٪ بين النساء؛ و٨ , ١٥٪ في المناطق الحضرية، و١ , ١٩٪ في المناطق الريفية. وبلغ مؤشر التركيز ٠٣٢ , ٠– في البلد كليةً؛ و٠٩٨ , ٠– بين الرجال، و٢٤٦ , ٠– بين النساء، و٠١٤ , ٠ في المناطق الحضرية، و٠٥٩ , ٠– في المناطق الريفية، وتباين المؤشر في مختلف الأقاليم في البلد. وبلغت نسبة التدخين ٠ , ١٨٪ في الشريحة الخمسية الأولى، و٥ , ١٣٪ في الشريحة الخمسية الخامسة، بفجوة بلغت ٥ , ٤٪. ويرتبط الجزء الرئيسي لهذه الفجوة بالفروق في مستوى التعليم، ونوع الجنس، والحالة الزواجية، والسن، والفئات الاقتصادية.

الاستنتاج: هناك عدم مساواة اجتماعية واقتصادية لصالح الأغنياء في التدخين، خاصة بين النساء وفي الأقاليم الجنوبية. وتتضمن التدخلات السليمة للقضاء على عدم المساواة ومكافحة التبغ زيادة مستوى التعليم وتمكين النساء ذوات المستوى الاجتماعي والاقتصادي المنخفض.

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Smoking behaviour after enforcement of a 100% tax on tobacco products in Saudi Arabia: a cross-sectional study

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Abstract

Background: Raising the prices of cigarettes is a common intervention to control tobacco use. In June 2017, Saudi Arabia imposed a 100% excise tax on tobacco products and energy drinks.

Aims: This study aimed to evaluate the impact of the increase in prices on tobacco products and the resulting cigarette smoking behaviour in Jeddah, Saudi Arabia before and after the increase in tobacco product prices.

Methods: This cross-sectional study was conducted between December 2017 and March 2018 in Saudi Arabian smokers aged 18 years and more. A validated questionnaire was distributed to a convenience sample in public places and through Twitter. The McNemar matched pairs chi-squared test was used to evaluate the self-reported difference in cigarette smoking before and after the tax came into effect. Binary logistic regression analysis was done to identify the socioeconomic and health factors associated with stopping smoking.

Results: In all, 376 participants (80.0% men) completed the questionnaire. A large proportion of the participants (39.6%) reported no change in their smoking behaviour after the tax was imposed, whereas 29.8% switched to cheaper brands. Before the tax, 154 participants smoked 15 cigarettes or more a day; this figure decreased to 134 after the tax (McNemar test, $P < 0.001$). Respondents who were married, unemployed, had a higher income or who rated their health as fair were significantly more likely to have stopped smoking after the tax.

Conclusion: The sharp increase in cigarette prices in Saudi Arabia has led to a statistically significant reduction in smoking. Future research should assess the long-term effects of this intervention on smoking onset, prevalence and relapse.

Keywords: tobacco smoking, smoking cessation, taxation, Saudi Arabia

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Introduction

Smoking tobacco products is one of the biggest global threats to health. It is a major cause of death as it contributes to many types of cancers and other diseases that affect various body systems including the cardiovascular, pulmonary, skeletal, endocrine, digestive and reproductive systems (*1*). The length of exposure to tobacco products determines how rapidly these diseases develop and how severe they become (*2*).

About one billion people in the world are estimated to smoke tobacco products (*3*). In 2013, a nationally representative study was conducted to assess tobacco consumption in Saudi Arabia, which included 10 735 males and females aged 15 years or older (*4*). The study showed that about 16.0% of Saudi Arabians had smoked tobacco in their lifetime and 12.2% were current smokers. Furthermore, among current smokers, 74.1% smoked an average of 15.1 cigarettes a day. In addition, 1.4% smoked both cigarettes and the waterpipe on a daily basis (*4*).

Many interventions have been implemented throughout the world to eliminate smoking. A common intervention to control smoking is to raise the price of tobacco products. A study in the United States of America on the effect of taxes and smoking bans in bars and restaurants on daily and non-daily smoking between 2001 and 2011 suggested that these measures were associated with a reduction in smoking, especially when they were combined (*5*). Furthermore, taxation had a stronger inverse association with daily smoking than with non-daily smoking (*5*). A study in men in Japan on smoking cessation attempts after an increase in the tobacco tax found that this increase was a strong motivator for trying to stop smoking in those with medium nicotine dependence according to the Fagerström test for cigarette dependence (a scores of 4–6), odds ratio (OR) = 1.44, 95% confidence interval (CI): 1.09–1.90 (*6*).

In Saudi Arabia, the deaths of 71 men and 21 women

were attributed to tobacco consumption every week in 2013 (7). Smoking is also an economic burden for Saudi Arabia. Between 2001 and 2010, tobacco consumption was estimated to cost the country about US$ 20.5 billion because of the cost of premature deaths and the direct and indirect costs of morbidity (8). According to the latest available data, tobacco control programmes cost the government US$ 4.8 million a year (9). The government of Saudi Arabia has implemented many measures over the years to reduce smoking in the population. For example, a national tobacco control programme was established in 2002 by the Ministry of Health (10). This programme aims to combat smoking in the different groups of the population by providing scientific (research and evidence gathering) and advisory services. Moreover, the programme supervises more than 70 clinics across the country that help people who want to give up smoking (11). The programme also plays an important role in developing new measures to control the use of tobacco products (11).

In June 2017, Saudi Arabia imposed a 100% tax on tobacco products (including cigarettes and waterpipe tobacco) and energy drinks (12). An opinion survey by one of the most popular Arab news websites (Sabq.org), showed that 45% of the participants thought the tax would discourage smoking to a limited extent, while 61% of those who reported smoking 10–20 cigarettes a day thought that it would not affect their smoking habits at all (13).

To the best of our knowledge, no study has investigated the effects of the 2017 tax on tobacco products on the cigarette consumption of adult smokers in Saudi Arabia. We assumed that this tax would reduce cigarette smoking in the country. We therefore aimed to evaluate the effect of this tax on cigarette smoking behaviour in Saudi Arabians in the city of Jeddah and to identify the socioeconomic and health factors associated with stopping smoking.

Methods

This cross-sectional study was conducted between December 2017 and March 2018, 6 months after the government imposed the tax on tobacco products. The population consisted of all Saudi Arabian adults (≥ 18 years old), men and women, who lived in Jeddah and had started smoking before June 2017.

A questionnaire was developed in Arabic to evaluate the cigarette smoking behaviour of smokers before and after the increase in the price of cigarettes as a result of the tax, and to identify the sociodemographic factors associated with stopping smoking. The questionnaire had two main parts. The first part asked for sociodemographic information about the participants including: city of residence, sex, age, marital status, education, general health status as perceived by the participant, employment and monthly income. The second part asked about smoking status before and after the increased price of cigarettes. The options for modifications in smoking habits after the tax were: reduced the number of cigarettes smoked a day, or switched to cheaper smoking method or cigarette brand. The second part also measured the current and previous (up to June 2017) number of cigarettes smoked a day and the frequency of smoking (daily or not) and if the participant had tried to stop smoking after the increase in prices.

To test the extent to which the study questionnaire could address the research objectives, the questions were reviewed for face validity by specialist clinicians in epidemiology and public health and medical educational staff at the College of Medicine of King Saud bin Abdualziz University for Health Sciences in Jeddah. The questions were modified accordingly and these questions were tested in a small pilot survey of 35 respondents drawn from the same population of the study. The pilot survey assessed the clarity and understandability of the questions and only minor changes to the wording of a few questions were made. To ensure the reliability of the questionnaire (the degree to which responses are consistent over time), a test and re-test method was used. We distributed the questionnaire to 35 respondents and their answers were recorded. Two weeks later, the same respondents again completed the questionnaire. The correlation coefficient between the two sets of responses was 0.875, which indicates a high degree of correlation and consistency between the responses at the two different times. The questionnaire was distributed by hand in public places (e.g. shopping malls and the Corniche) in Jeddah by three of the coauthors. It was also distributed through a few Twitter accounts of public figures from Jeddah. Twitter was used to ensure that we reached groups not available in public places and to minimize the gap between male and female respondents because there is segregation between the sexes in Saudi Arabia in public places and Twitter can help overcome this.

Because prevalence studies of smokers in Jeddah are lacking, we assumed that the target population was 20 000. Using the sample size calculator from the Raosoft website (Raosoft®, Inc.), with 95% confidence intervals, a 5% margin of error and a 50% presumed response distribution, the required sample size was calculated to be 377.

Data analysis

Data management and analysis were done using the SPSS, version 23.0.0.0. Descriptive statistics were used (frequencies and percentages) for categorical variables, a chi-squared test of McNemar matched pairs was used to test significant differences in cigarette consumption before and after the increase in cigarette prices. In addition, a binary logistic regression analysis was used to identify the socioeconomic and health correlates of the decision to stop cigarette smoking after the prices were raised.

Ethical considerations

Ethical approval to conduct the study was obtained from King Abdullah International Medical Research Center, Riyadh, Saudi Arabia.

Table 1 Sociodemographic characteristics of participants

Sociodemographic characteristic	No. (%) (n=376)
Sex	
Male	301 (80)
Female	75 (20)
Age (years)	
18–29 years	185 (49.2)
30–44 years	121 (32.2)
45–60 years	54 (14.4)
Over 60 years	16 (4.2)
Marital status	
Never married	186 (49.5)
Married	168 (44.5)
Widowed	13 (3.5)
Divorced/separated	9 (2.5)
Education	
Primary school or less	13 (3.5)
Intermediate or secondary school	111 (29.5)
College	229 (60.9)
Higher education	23 (6.1)
Health status	
Excellent	306 (81.4)
Fair	69 (18.4)
Poor	1 (0.26)
Employment status	
Student	102 (27.1)
Employed	226 (60.1)
Unemployed	48 (12.8)
Monthly income (Saudi riyals[a])	
< 5000	143 (38)
5001–10000	112 (29.8)
10001–15000	75 (20)
15001–25000	38 (10.1)
> 25000	8 (2.1)

[a]US$ 1 = 3.75 Saudi Riyals. Percentages do not all sum to 100 because of rounding.

Results

Baseline characteristics

A total of 376 adults took part in the study and completed the survey; 301 (80.1%) were men (Table 1). Almost half of the respondents (49.2%) were aged between 18 and 29 years and had never been married (49.5%). Most of the respondents (81.4%) described their health status as excellent. About two thirds of the respondents (67.0%) were college graduates or had a postgraduate degree and 102 (27.1%) were students (high school or university). Most of the respondents (60.1%), were employed.

Cigarette smoking status evaluation

Table 2 summarizes the cigarette consumption of the male and female respondents. About 40% of the participants reported no change in their smoking behaviour after the increase in cigarette prices, whereas about 30% switched to a cheaper cigarette brand. Of the whole sample, 174 (46.3%) participants had previously tried to stop smoking before the increase in prices in 2017, while 135 (35.9%) tried to quit in the 6 months after the price increase. A slightly greater percentage of females (48.0%) than males (37.5%) reported no change in their smoking behaviour after the increase in prices. In addition, fewer females than males attempted to stop smoking before the price increase (29.3% versus 50.5% respectively) or after it (24.0% versus 38.9%). Before the increase in cigarette prices, 167 (44.4%) respondents reported that they smoked 15 cigarettes or more a day, while 113 (30.1%) reported that they smoked fewer than 15 cigarettes a day. After the price increase, these figures were 138 (36.7%) and 126 (33.5%) respectively.

Reduction in cigarette smoking

Table 3 shows the results of the McNemar test for matched pairs of cigarette consumption which indicated a significant difference in cigarette consumption in the study population before and after the tax was imposed (χ^2 = 22.2, P value < 0.0001). As shown, before the tax was imposed, 154 of the participants smoked 15 or more cigarettes a day, and this number decreased to 134 after the tax came into force. At the same time, the number of respondents who smoked less than 15 cigarettes a day increased from 99 to 119.

Factors associated with changes in smoking behaviour

Table 4 shows the results of binary logistic regression where the dependent variable was stopping cigarette smoking in the 6 months after the tax was imposed. Sex, age, and education were not significantly associated with the decision to stop smoking after the tax was imposed. In contrast, married respondents were more likely to stop smoking after the tax (OR = 3.24, 95% CI: 1.15–6.97) compared with those who were never married. In addition, respondents with self-reported fair health status were more likely to stop smoking after the tax came into effect (OR = 2.96, 95% CI: 1.32–5.24) compared with those who reported an excellent health status. Unemployed respondents were more likely to stop smoking after the tax (OR = 3.36, 95% CI: 1.15–9.71) compared with students. Compared with respondents with a monthly income of < 5000 Saudi riyals (1 US$ = 3.75 Saudi riyals), respondents with a monthly income of 5001–10 000 Saudi riyals and 15 001–25 000 Saudi riyals were more likely to stop smoking, OR = 2.56, 95% CI: 1.26–5.23 and OR = 3.36, 95% CI: 1.53–8.91 respectively.

Discussion

In June 2017, the Saudi Arabian government doubled the price of tobacco products as a means to control smoking in the country. In this study, we aimed to assess the effect of this tax on the smoking behaviour among cigarette smokers in Jeddah, Saudi Arabia.

Table 2 Smoking behaviour of participants before and after the increases in cigarette prices, according to sex

Variable	Male N (%)	Female N (%)	Total N (%)
Change in smoking behaviour after price increase of cigarettes			
No change	113 (37.5)	36 (48)	149 (39.6)
Switched to another tobacco method of smoking	23 (7.6)	7 (9.3)	30 (8)
Switched cigarette brand	93 (30.9)	19 (25.3)	112 (29.8)
Reduce smoking amount	34 (11.3)	8 (10.7)	42 (11.2)
Reduced smoking amount and switched cigarette brand	38 (12.6)	5 (6.7)	43 (11.4)
Attempted to quit before price increase			
Yes	152 (50.5)	22 (29.3)	174 (46.3)
No	149 (49.5)	53 (70.6)	202 (53.7)
Attempted to quit after price increase			
Yes	117 (38.9)	18 (24)	135 (35.9)
No	184 (61.1)	57 (76)	241 (64.1)
Cigarette consumption before price increase			
Less than daily	33 (10.9)	15 (20)	48 (12.8)
Daily < 15 cigarettes	147 (48.8)	20 (26.7)	167 (44.4)
Daily ≥ 15 cigarettes	91 (30.2)	22 (29.3)	113 (30.1)
Don't know	30 (9.9)	18 (24)	48 (12.8)
Cigarette consumption after price increase			
Less than daily	46 (15.3)	17 (22.7)	63 (16.8)
Daily < 15 cigarettes	122 (40.5)	16 (21.3)	138 (36.7)
Daily ≥ 15 cigarettes	101 (33.6)	25 (33.3)	126 (33.5)
Don't know	32 (10.6)	17 (22.7)	49 (13)

Before the 2017 tax, the Saudi Arabia government had taken many steps to control and prevent smoking. For example, in 2005, Saudi Arabia adopted the World Health Organization Framework Convention on Tobacco Control (*14*). By December 2016, the total taxes imposed on the most popular tobacco brand were 33.3% for cigarettes and 40% for waterpipes (*9*). Despite that, according to a survey conducted in 1995, prices were not a concern to smokers in Saudi Arabia (*15*). We found that imposing a 100% tax on tobacco products was significantly associated with a reduction in cigarette smoking. This is consistent with the literature, where increasing cigarettes prices has been proven to be an effective intervention to reduce smoking (*16–20*).

Although the relationship between smoking cessation and socioeconomic factors has been studied in depth in many cultures (*21–26*), few studies on the factors affecting the decision to stop smoking have been conducted on Saudi Arabians. Our results showed that several factors were significantly associated with an increased willingness to stop smoking after the tax was imposed.

First, marital status was a statistically significant predictor of smoking reduction and cessation after the tax. Those who were married were three times more likely to quit smoking than those who had never married. This is consistent with another study in Saudi Arabia where being single was strongly associated with smoking (*27*). However, another study in male Saudi Arabian college

Table 3 Difference in cigarette consumption before and after implementation of the tax on cigarettes: McNemar test for matched pairs

After the tax	Before the tax			McNemar test
	< 15 cigarettes a day	≥ 15 cigarettes a day	Total	
< 15 cigarettes a day	90	29	119	$\chi 2 = 22.2$, OR = 3.2, P < 0.001
≥ 15 cigarettes a day	9	125	134	
Total	99	154	253	

OR = odds ratio.

Table 4 Association between stopping smoking and sociodemographic characteristic: binary logistic regression analysis

Variable	P-value	OR (95% CI)
Sex		
Male		1.0 (ref)
Female	0.617	0.840 (0.75–1.21)
Age (years)		
18–29		1.0 (ref)
30–44	0.785	1.113 (0.79–1.45)
45–60	0.093	0.398 (0.17–0.88)
≥ 60	0.454	1.763 (1.10–2.24)
Marital status		
Never married		1.0 (ref)
Married	0.003	3.24 (1.15–6.97)
Widowed	0.026	5.41 (1.23–23.83)
Divorced/separated	0.758	0.70 (0.53–1.65)
Education		
Primary school or less		1.0 (ref)
Intermediate or secondary school	0.220	1.67 (1.16–2.32)
College	0.713	0.85 (0.64–1.37)
Postgraduate	0.836	1.15 (0.90–1.54)
Health status		
Excellent		1.0 (ref)
Fair	0.006	2.96 (1.32–5.24)
Poor	0.915	0.81 (0.67–1.65)
Employment status		
Student		1.0 (ref)
Employed	0.430	0.73 (0.46–1.49)
Unemployed	0.026	3.36 (1.15–9.71)
Monthly income (Saudi riyals)[a]		
< 5000		1.0 (ref)
5001–10 000	0.010	2.56 (1.26–5.23)
10 001–15 000	0.131	0.53 (0.33–1.10)
15 001–25 000	0.027	3.36 (1.53–8.91)
> 25 000	0.428	0.43 (0.26–1.01)

OR: odds ratio; 95% CI: 95% confidence interval; ref: reference category.

a1 US$ = 3.75 Saudi riyals

Note: The dependent variable was stopping cigarette smoking in the 6 months after the implementation of the tax on cigarettes in 2017.

students reported that marital status was not a predictor of the willingness to stop smoking (*28*). This difference can be attributed the fact that the latter study consisted of single students, making the assessment of the effect of marital status inappropriate. Second, respondents who reported their general health status as fair were about three time more likely to stop smoking after the tax than those who considered their health to be excellent. The combined effect of these factors (marriage and suboptimal self-perceived health status) together with the financial strain caused by the tax could be the reason for the increased willingness to quit smoking.

Unemployment was also significantly associated with stopping smoking. Research in other countries has shown a high prevalence of smoking among unemployed people (*29,30*). Price increases of tobacco products might provide this group with a valuable chance to reduce and stop smoking.

Interestingly, respondents with a higher monthly income (between 15 0001 and 25 000 Saudi riyals) were more likely to stop smoking than individuals with a low monthly income. Other studies have shown that people with a lower income tend to be more or equally responsive to increases in cigarette prices (*31,32*). This difference might be because switching to lower priced brands was the most common behavioural change among smokers in our sample. However, a longer follow-up of a nationally representative sample of smokers might help explore the

long-term effects of the tax on those with lower income and explain why they were less sensitive to it in the first 6 months of its implementation.

Limitations

Our study has some limitations. First, the convenience sampling limits the generalization of results to the whole Saudi Arabian population. Second, the study sample was over-represented by educated participants and, hence, the results should be interpreted with caution. Third, our data on smoking were self-reported by the participants, which is subject to recall bias and social desirability bias – participants may not have been truthful about their smoking because of the traditional and conservative society in Saudi Arabia. Fourth, our study was limited to the city of Jeddah, Saudi Arabia. For that reason, a more comprehensive study is needed to assess the overall effect of the tax on different groups of smokers in all of Saudi Arabia

Conclusion

In summary, the sharp increase in cigarette prices in Saudi Arabia has led to a statistically significant reduction in smoking. The most common behaviour was switching to lower priced brands. Respondents who were married, unemployed, with higher income, or with fair self-reported health status were more likely to stop smoking after the tax was imposed. Future research should be directed to assessing the long-term effect of this intervention in terms of smoking onset, prevalence and relapse. Furthermore, other methods of assessing response to tobacco control interventions such as cigarette sales data and non-invasive biochemical measures (e.g. exhaled breath carbon monoxide) are more reliable ways to assess the effect of the tax on smoking behaviour.

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Comportement tabagique après l'entrée en vigueur d'une taxe de 100 % sur les produits du tabac en Arabie saoudite : étude transversale

Résumé

Contexte : La hausse du prix des cigarettes est une mesure couramment mise en place dans la lutte antitabac. En juin 2017, l'Arabie saoudite a imposé un droit d'accise de 100 % sur les produits du tabac et les boissons énergisantes.

Objectif : La présente étude avait pour objectif d'évaluer l'impact de la hausse des prix des produits du tabac et le comportement tabagique qui en résulte à Djeddah (Arabie saoudite) avant et après cette augmentation des prix.

Méthodes : Il s'agissait d'une étude transversale qui a été menée entre décembre 2017 et mars 2018 auprès de fumeurs saoudiens de 18 ans et plus. Un questionnaire validé a été distribué à un échantillon de commodité dans les lieux publics et sur Twitter. Le test χ^2 de McNemar pour les paires concordantes a été utilisé pour évaluer le changement de comportement en matière de tabagisme par cigarettes avant et après l'entrée en vigueur de la taxe. L'analyse de régression logistique binaire a été utilisée pour identifier les facteurs socio-économiques et sanitaires associés au sevrage tabagique.

Résultats : Au total, 376 participants (80 % d'hommes) ont rempli le questionnaire. Une proportion importante des participants (39,6 %) n'a rapporté aucun changement dans leur comportement tabagique après l'application de la taxe, tandis que 29,8 % des participants se sont tournés vers des marques moins chères. Avant l'entrée en vigueur de la taxe, 154 participants fumaient plus de 15 cigarettes par jour ; ce nombre est passé à 134 suite à l'imposition de la taxe ($p < 0,0001$). Les personnes interrogées qui étaient mariées, sans emploi, avaient des revenus élevés ou s'estimaient en bonne santé étaient plus susceptibles d'avoir arrêté de fumer après l'entrée en vigueur de la taxe.

Conclusion : La hausse marquée du prix des cigarettes en Arabie saoudite a entraîné une réduction du tabagisme statistiquement significative. Les futures études devraient évaluer les effets à long terme de cette mesure sur la mise en place du tabagisme, la prévalence du tabagisme par cigarettes et les rechutes.

سلوك التدخين بعد تطبيق الضرائب بنسبة ١٠٠٪ على منتجات التبغ في المملكة العربية السعودية: دراسة شاملة لعدة قطاعات

عبد الرحمن الغامدي، أنس فلاتة، فهد عوكل، طاهر فلمبان، محمد الدقير ، هند المديميغ

الخلاصة

الخلفية: يُعد رفع سعر السجائر أحد التدخلات الشائعة لمكافحة تعاطي التبغ. وفي يونيو/ حزيران ٢٠١٧، فرضت المملكة العربية السعودية ضريبة بمقدار ١٠٠٪ على منتجات التبغ والمشروبات السكرية.

الأهداف: هدفت هذه الدراسة إلى تقييم أثر رفع أسعار السجائر على سلوك التدخين الذي ينتهجه المدخنون السعوديون في جدة، المملكة العربية السعودية.

طرق البحث: أُجريت دراسة شاملة لعدة قطاعات في الفترة بين ديسمبر/ كانون الأول ٢٠١٧ ومارس/ آذار ٢٠١٨ بشأن المدخنين السعوديين البالغين ١٨ عاماً فما فوق. ووُزع استبيان مُتحقق منه على عينة ملائمة في الأماكن العامة ومن خلال تويتر. واستُخدمت الأزواج المتطابقة لاختبار

كاي χ^2 (ماكنمار) لتقييم الاختلاف في معدلات تدخين السجائر قبل فرض الزيادة الضريبية وبعدها. وأُجري تحليل الانحدار اللوجستي الثنائي لتحديد العوامل الاجتماعية الاقتصادية والصحية المرتبطة بالإقلاع عن التدخين.

النتائج: بلغ مجموع المشاركين الذين استكملوا الاستبيان ٣٧٦ شخصاً (٨٠٪ من الرجال). وأفادت نسبة كبيرة من المشاركين (٦ , ٣٩٪) بأن سلوك التدخين لديهم لم يتغير بعد فرض الضرائب، بينما تحول ٨ , ٢٩٪ منهم إلى أنواع أرخص سعراً. وقبل فرض الضرائب، كان أكثر من ١٥٤ شخصاً من المشاركين يدخنون أكثر من ١٥ سيجارةً يومياً؛ ولكن بعد فرض الضرائب انخفض هذا العدد إلى ١٣٤ شخصاً (القيمة الاحتمالية < ٠ , ٠٠٠١). ومن بين المستجيبين للاستبيان، كان المرجح بصورة أكبر أن يقلع عن التدخين عقب فرض الضرائب المتزوجون، أو العاطلون عن العمل، أو أصحاب الدخل الأعلى، أو الذين قيَّموا حالتهم الصحية بأنها متوسطة.

الاستنتاج: أدت الزيادة الكبيرة في أسعار السجائر في المملكة العربية السعودية إلى انخفاض التدخين انخفاضاً كبيراً. وعلى البحوث التي تُجرى في المستقبل أن تراعي الآثار الطويلة الأمد لهذا التدخل على بدء التدخين، وانتشاره، وحالات الانتكاس بعد الإقلاع عنه.

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Factors associated with dual use of waterpipe tobacco and cigarettes among adults in Pakistan

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Abstract

Background: Little is known about dual use of waterpipe tobacco and cigarettes, especially in countries where both are prevalent.

Aims: This study aimed to assess demographic correlates, patterns of use and quit behaviours of waterpipe users in Pakistan who also smoke cigarettes.

Methods: Data were taken from a randomized controlled trial in Pakistan that assessed smoking cessation in 510 adult waterpipe users, stratified on concurrent cigarette use. Logistic regression analysis was done to assess the association between waterpipe tobacco users who also smoke cigarettes (dual use) and their demographic characteristics, smoking history and quit behaviour. Unadjusted odds ratios (OR) and adjusted OR (ORa) and 95% confidence intervals (CI) were determined.

Results: Dual use was significantly associated with younger age (ORa = 0.36, 95% CI: 0.19–0.70) and middle-school educational level (11–15 years), versus no formal education, (ORa = 2.01, 95% CI: 1.15–3.50). Dual use was also associated with smoking less than all day versus all day (defined as continuously for several hours) (ORa = 2.71, 95%: CI 1.73–4.25) and younger age at starting smoking (ORa = 0.95, 95% CI: 0.93–0.98). No association was found between dual use and sex, marital status, duration of smoking, nicotine dependence or quit history.

Conclusion: Waterpipe tobacco users who also smoke cigarettes differ from waterpipe-only users, particularly in demographic characteristics. More research is needed to explore the interaction between these two smoking behaviours. Health promotion and cessation interventions in Pakistan should consider tailoring their approach to account for the unique characteristics of dual waterpipe and cigarette users.

Keywords: waterpipe, hookah, shisha, cigarettes, tobacco, Pakistan

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Introduction

Waterpipe tobacco use is a centuries old practice in Middle Eastern and South Asian cultures, usually among older males in rural settings *(1)*. The 1990s saw the mass manufacture of flavoured *mo'assel* (honeyed) waterpipe tobacco, which gained popularity in young people in these regions and spread to North American and European countries *(2,3)*. The Middle East and South Asia have the highest prevalence of waterpipe tobacco use globally. However, according to the Global Youth Tobacco Survey, more than 10% of schoolchildren were current (past 30 days) users in the Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, Slovakia, Slovenia and Ukraine *(4)*. The 2017 National Youth Tobacco Survey in the United States of America (USA) reported that 3.3% of high-school students were current waterpipe users *(5)*.

The global rise of waterpipe tobacco smoking, and indeed other non-cigarette tobacco products, has led to an increasing prevalence of dual and polytobacco use, which is a public health concern. Modelling estimates suggest that waterpipe tobacco users who also use cigarettes, smoke both products more frequently and intensely than those who only use one smoking method, thereby exposing them to even more tobacco-related harm *(6)*. A recent systematic review has shown that waterpipe tobacco use predicts later initiation of cigarette smoking *(7)*. In addition, a randomized controlled trial found that some smokers who successfully quit cigarettes were found to then start using waterpipe tobacco *(8)*. Smoking the waterpipe to complement or substitute for other types of tobacco use undermines the public health gains made in tobacco control and requires more investigation.

While much research exploring the reasons for waterpipe tobacco smoking has been done *(9,10)*, few studies have examined dual use of the waterpipe and cigarettes. Cigarette smoking tends to fulfil an individual need that may include coping with stress and satisfying nicotine cravings. Waterpipe tobacco smoking, however, is often described as a pleasurable experience that centres on socializing with others *(11)*. Nearly all research on the differences between dual and waterpipe-only tobacco use has been done in the USA or the United

Kingdom, and such studies are generally limited to assessing sociodemographic differences *(12–17)*. Only a few studies have assessed patterns of use in more detail. For example, in a small sample of Arab-Americans in the USA, dual waterpipe and cigarette users were found to be more dependent on cigarettes and had more barriers to stopping smoking than cigarette-only users *(18)*. In a large cross-sectional study in the Islamic Republic of Iran, dual waterpipe and cigarette users were more likely to be male and smoke waterpipe tobacco more regularly and in different venues compared with waterpipe-only users *(19)*. This suggests that dual users may respond differently to interventions to control waterpipe use, such as health awareness campaigns and behavioural change techniques, but more research is needed to confirm this assumption in different settings.

To our knowledge, only one study in the Islamic Republic of Iran *(19)* and another in schoolchildren in Jordan *(20)* have assessed dual waterpipe tobacco and cigarette use outside of North American and European settings. This is of concern given that both waterpipe tobacco and cigarette use are far more prevalent in the Middle East and South Asia than elsewhere *(21)*. Attitudes to tobacco use, quitting and tobacco control policies may also be different in dual users *(15,16)*. Pakistan, in particular, has a unique waterpipe tobacco context that is largely unexplored and users of waterpipe tobacco in Pakistan are among the most nicotine-dependent globally *(22,23)*. This is the result of a national ban on flavoured *mo'assel* waterpipe tobacco *(24)* and the predominant use of an unflavoured and traditional tobacco type that has a high nicotine content *(25)*. Little is known about the patterns of use of unflavoured waterpipe tobacco in areas where it is used and it is unclear whether dual waterpipe tobacco and cigarette users differ from waterpipe-only users in Pakistan. This has implications for the design of tobacco cessation interventions and tobacco control in general.

This study aimed to assess the demographic characteristics, patterns of use and quit behaviour of waterpipe tobacco users in Pakistan who also smoke cigarettes compared to those who only use the waterpipe.

Methods

Study setting, design and sample

Data were analysed from participants recruited to a randomized controlled trial in 2016 testing the effect of varenicline on smoking cessation among adult waterpipe smokers in Pakistan *(23)*. The trial protocol and full methods are published elsewhere *(26)*. Briefly, the study recruited adult participants from four districts of Punjab, Pakistan, who smoked waterpipe tobacco daily (> 25 days a month) for at least six months. Concurrent cigarette use was employed as a stratifying variable in the study design based on the prevalence of dual use found in a previous smoking cessation trial in Pakistan *(22)*. Recruitment was done in hospitals through distribution of posters and leaflets and in the community through local media and community networks. People were eligible for inclusion in the trial if they intended to quit waterpipe use, but were excluded if they had used pharmacotherapy for tobacco dependence in the past 30 days; were pregnant, lactating or planning to become pregnant; had a medical condition requiring hospitalization; had a previous allergic reaction to varenicline; had a history of heart disease, stroke, epilepsy or mental health conditions; or if they currently used smokeless tobacco or other substances (including alcohol misuse) besides smoked tobacco. Ethical approval for the randomized controlled trial was obtained from the National Bioethics Committee of the Pakistan Medical Research Council and the Research Governance Committee at the University of York, United Kingdom. Informed consent was obtained from each participant.

Measures

A questionnaire developed on the existing literature *(27–29)* was distributed. This questionnaire recorded demographic data, smoking patterns and history, motivation to quit, withdrawal symptoms and dependency measures (based on the Lebanon Waterpipe Dependence Scale score). The outcome measure of interest for the current study was dual waterpipe and cigarette use. Waterpipe use was defined as smoking at least 25 days a month for at least the past six months, and cigarette use was defined as smoking cigarettes at least once in the past 30 days.

Demographic information recorded included age, sex, marital status, educational level and occupation. Waterpipe smoking history included: daily use (all day, defined as many continuous hours of smoking at a time/less than all day); length of smoking sessions (smoking without a break) in minutes; smoking duration in years; age at starting smoking; and total dependency score based on the Lebanon Waterpipe Dependence Scale. This tool is adapted from the Fagerstrom Test for Nicotine Dependence and DSM-IV for substance addiction and has been validated in other low- and middle-income countries *(29,30)*. Waterpipe quit history variables included: previous quit attempts (yes/no), and, if yes, the number of previous quit attempts, time since last quit attempt and longest abstinence time.

Statistical analysis

Data were analysed descriptively using frequency counts and percentages for categorical variables and data and the mean and standard deviation (SD) for continuous variables (or the median and interquartile range if the data were skewed). Demographic characteristics, waterpipe smoking history, waterpipe quit history and quit outcome were cross-tabulated by dual use of waterpipe and cigarettes. We then constructed logistic regression models to test the relationship between dual waterpipe and cigarette use and the independent variables. We checked for collinearity between independent variables by assessing the variance inflation factor, which was less than two for all variables. Model 1 examined associations without adjusting for confounding and presents the unadjusted odds ratios (ORs) and 95% confidence intervals (95% CIs).

Variables that were statistically significant at $P < 0.05$ in model 1 were entered into model 2, which was adjusted for all variables in the model. We took an alpha value of less than 0.05 to be statistically significant and presented adjusted odds ratios (ORa) with 95% CI. All analyses were done using Stata 15.0.

Results

A total of 510 participants were included in the study; their characteristics are shown in Table 1. The median age of the participants was 48 years, 429 (84.1%) were male (by design of the trial), 440 (86.3%) were married, 187 (36.7%) had no formal education and 195 (38.2%) worked in agriculture. The median duration of waterpipe smoking was 25 years and median length of smoking sessions was 10 minutes (range 1–79 minutes). As regards daily use, 128 (25.1%) smoked the waterpipe all day (continuously for hours) as opposed to less than all day. The mean age at starting smoking was 21.9 years. The mean score on the Lebanon Waterpipe Dependence Scale was 19.2 (SD 4.0), indicating a highly nicotine-dependent sample. Previous quit attempts were reported by 95 (18.6%) participants;

Table 1 Demographic and smoking characteristics of the sample by waterpipe-only and dual (waterpipe and cigarettes) use

Variable	Total (*n* = 510)	Waterpipe-only users (*n* = 249)	Dual users (*n* = 261)
Demographic characteristics			
Age, median (IQR)	48 (37–60)	50 (40–62)	46 (35–57)
Sex, no. (%)			
Female	81 (15.9)	41 (16.5)	40 (15.3)
Male	429 (84.1)	208 (83.5)	221 (84.7)
Marital status, no. (%)			
Married	440 (86.3)	212 (85.1)	228 (87.4)
Other (unmarried, divorced, widowed)	70 (13.7)	37 (14.9)	33 (12.6)
Educational level, no. (%)			
No formal education	187 (36.7)	107 (43.0)	80 (30.7)
Primary	147 (28.8)	71 (28.5)	76 (29.1)
Middle	104 (20.4)	39 (15.7)	65 (24.9)
Secondary or higher	72 (14.1)	32 (12.9)	40 (15.3)
Occupation, no. (%)			
Professional, clerical or sales	56 (11.0)	34 (13.7)	22 (8.4)
Skilled or unskilled manual	61 (12.0)	28 (11.2)	33 (12.6)
Domestic service	98 (19.2)	53 (21.3)	45 (17.2)
Agricultural	195 (38.2)	97 (39.0)	98 (37.6)
Daily wage earner	52 (10.2)	21 (8.4)	31 (11.9)
Other[a]	48 (9.4)	16 (6.4)	32 (12.3)
Waterpipe smoking history			
Daily use, no. (%)			
All day (continuously for several hours)	128 (25.1)	81 (32.5)	47 (18.0)
Less than all day	382 (74.9)	168 (67.5)	214 (82.0)
Session length, median (IQR) (minutes)	10 (5–10)	10 (6–10)	9 (5–10)
Smoking duration, median (IQR) (years)	25 (15–38)	25 (15–40)	25 (14–35)
Age started smoking, mean (SD) (years)	21.9 (8.5)	23.6 (9.6)	20.4 (7.1)
LWDS score, mean (SD)	19.2 (4.0)	19.4 (3.7)	18.9 (4.3)
Waterpipe quit history			
Previous quit attempt, no. (%)			
No	415 (81.4)	210 (84.3)	205 (78.5)
Yes	95 (18.6)	39 (15.7)	56 (21.5)
Number of quit attempts, median (IQR)	1 (1–3)	1 (1–3)	1 (1–3)
Time since last quit attempt, median (IQR) (years)	2 (1–7)	2 (0.7–7)	2 (1–5)
Longest abstinence length, median (IQR) (years)	0.3 (0.3–1)	0.3 (0.3–1)	0.3 (0.3–1)

IQR: interquartile range, SD: standard deviation, LWDS: Lebanon Waterpipe Dependence Scale.

[a]*Other: other occupations, unemployed, retired or student.*

the median number of quit attempts was 1, the median time since the last quit attempt was 2 years, and the median longest abstinence time was 0.3 years.

Table 1 also shows cross-tabulations between the outcome variable (dual use) and the independent variables (demographic and waterpipe smoking characteristics). Just over half the sample (261, 51.2%) were dual waterpipe and cigarette users, reflecting the stratification process of the study design. Dual users were about 4 years younger than waterpipe-only users (46 versus 50 years), and had reached a higher educational level and different occupations. Both waterpipe-only and dual users had smoked waterpipe tobacco for 25 years, and had similar lengths of smoking sessions and scores on the Lebanon Waterpipe Dependence Scale (LWDS). More waterpipe-only users reported smoking waterpipe tobacco all day (continuously for hours) compared with dual users (63.3% versus 36.7%). The two groups were broadly similar with respect to waterpipe quit history.

Table 2 shows the results of the logistic regression analyses assessing the association of demographic and waterpipe smoking characteristics with dual use. The unadjusted model (model 1) showed that dual use was significantly associated with younger age, middle-school education (compared with no education) and working as a daily wage earner or in other occupations (including unemployed or retired people or students). We found no statistically significant association between dual use and sex or marital status. Dual use was also associated with smoking less than all day rather than all day (continuously for hours), shorter session lengths and younger age at starting smoking. We found no statistically significant association between waterpipe quit history and dual use.

In the adjusted model (model 2), the association between dual use and age, middle-school education, less than daily use, and younger age at starting smoking remained statistically significant. One main difference between model 2 and model 1 was that all other occupation categories were more likely to report dual use compared with professional, clerical or sales occupations. Another main difference was that the length of waterpipe sessions was not associated with dual use in adjusted model, although the 95% CIs could not rule out a tentative association (ORa = 0.73, 95% CI: 0.52–1.01).

Discussion

We found that age, educational level, occupation, daily use and age at starting smoking differed significantly between dual and waterpipe-only users in Pakistan. Dual users smoked waterpipe tobacco less intensely each day, and possibly had shorter waterpipe sessions, but showed no difference in dependence or quit measures compared with waterpipe-only users. Our findings provide insight into tobacco use behaviours in waterpipe users in Pakistan, which may help generate hypotheses for future research and approaches for behavioural change interventions to help smokers quit in Pakistan and the Region.

Several factors may explain the findings, although these are tentative and need to be more fully investigated in future research. Firstly, there was a possible socioeconomic gradient with respect to dual use and educational level. This may be because dual use is a more expensive habit to maintain than waterpipe-only use. More educated smokers may have more disposable income to afford dual use. Secondly, a single session of waterpipe tobacco use may last over an hour, and a quarter of our sample reported smoking it all day (continuously for hours). Participants who reported smoking waterpipe tobacco all day were less likely to report dual use, which might reflect the lack of time to also smoke cigarettes or that there was no need for additional nicotine. The very LWDS scores in this study suggests a highly nicotine-dependent sample, regardless of concurrent cigarette use. Thirdly, occupations that were significantly associated with dual use may be less restrictive on any form of smoking at the workplace (e.g. agricultural work, casual work). Professional, clerical or sales occupations may be more likely to be indoor jobs and therefore subject to indoor smoking restrictions. In addition, assembling and smoking waterpipe tobacco indoors may be more difficult given that waterpipes are big and the preparation process is long.

Our findings differ from the literature and may reflect the unique tobacco control context in Pakistan and also our recruitment criteria. Our study suggests that dual users of waterpipe and cigarettes are less intense users of waterpipe tobacco than waterpipe-only users. A cross-sectional study in adults in the Islamic Republic of Iran showed the opposite; 80.3% of dual waterpipe tobacco and cigarette users smoked waterpipe more than 3–4 times a month (which is considered quite regular) compared with 60.7% of waterpipe-only users *(19)*. The greater use of waterpipe tobacco among dual users was also reported in schoolchildren in the Middle East *(6)*. Dual or polytobacco users of products other than waterpipe tobacco also report more dependence *(31,32)*. The difference with our findings may reflect the fact the most of the Iranian sample smoked flavoured waterpipe tobacco (most probably *mo'assel*), which contains less nicotine and is mostly used intermittently, whereas the sample all smoked an unflavoured type of tobacco on at least 25 days a month. The sample was also limited to participants who smoked waterpipe tobacco daily, whereas other studies of dual use had no restrictions on the frequency of waterpipe smoking.

Conclusion

These findings can be used to tailor more effective health education interventions for dual users of waterpipe tobacco and cigarettes. Cessation services should consider designing programmes that include dual or polytobacco use. Pakistan recently decreased taxes on tobacco *(33)*; given the known effectiveness of this intervention in reducing smoking and benefitting public health, this reduction should be urgently reversed. In view of the distinct characteristics of dual waterpipe and cigarette users compared with waterpipe-only users, how changes in tobacco control policies, such as taxation, affect sociodemo-

Table 2 Association of demographic and waterpipe smoking characteristics with dual use (waterpipe and cigarettes): logistics regression analyses

Variable	Model 1 (unadjusted) OR (95% CI)	Model 2 (adjusted[b]) ORa (95% CI)
Demographic characteristics		
Age	0.41 (0.24–0.72)**	0.36 (0.19–0.70)**
Sex		
Female	1.00	–
Male	1.09 (0.68–1.75)	–
Marital status		
Married	1.00	–
Other (unmarried, divorced, widowed)	0.83 (0.50–1.37)	–
Educational level		
No formal education	1.00	1.00
Primary	1.43 (0.93–2.21)	1.41 (0.87–2.27)
Middle	2.23 (1.36–3.64)**	2.01 (1.15–3.50)*
Secondary or higher	1.67 (0.97–2.89)	1.73 (0.90–3.34)
Occupation		
Professional, clerical or sales	1.00	1.00
Skilled or unskilled manual	1.82 (0.87–3.80)	2.44 (1.06–5.60)*
Domestic service	1.31 (0.67–2.56)	2.20 (1.01–4.78)*
Agricultural	1.56 (0.85–2.86)	2.32 (1.16–4.64)*
Daily wage earner	2.28 (1.06–4.93)*	3.30 (1.39–7.82)**
Other[a]	3.09 (1.38–6.91)**	5.39 (2.16–13.41)***
Waterpipe smoking history		
Daily use		
All day (continuously for several hours)	1.00	1.00
Less than all day	2.20 (1.45–3.32)***	2.71 (1.73–4.25)***
Session length	0.74 (0.54–1.00)*	0.73 (0.52–1.01)
Smoking duration	0.99 (0.79–1.25)	–
Age at starting smoking	0.95 (0.93–0.97)***	0.95 (0.93–0.98)***
LWDS score	0.97 (0.93–1.01)	–
Waterpipe quit history		
Previous quit attempt		
No	1.00	–
Yes	1.47 (0.94–1.31)	–
Number of quit attempts	1.03 (0.54–1.95)	–
Time since last quit attempt (years)	0.98 (0.72–1.34)	–
Longest abstinence length (years)	0.98 (0.52–1.84)	–

LWDS: Lebanon Waterpipe Dependence Scale, OR: odds ratio, CI: confidence interval.

**P < 0.05, **P < 0.01, ***P < 0.001.*

[a]*Other occupations, unemployed, retired or student.*

[b]*Adjusted for all variables in the model.*

graphic inequalities in waterpipe tobacco use, needs to be understood. Policy-makers should be mindful of possible substitution of products so any tax increases should be simultaneous and comparable across waterpipe tobacco and cigarettes (*34*). Public awareness activities on the harmful effects of waterpipe tobacco smoking are also urgently needed to change the attitudes and beliefs about this form of smoking and reduce motivation to use it.

This study is one of the first to examine dual waterpipe tobacco and cigarette use in Pakistan, an area where the use of waterpipe tobacco is prevalent and traditional. Future research should explore the age at starting to use both products and the reasons for doing this, knowledge of the health effects of waterpipe tobacco smoking and the specific barriers to quitting. The main limitation of this study is that the results are

not generalizable, since it was a relatively healthy sample of waterpipe smokers who wanted to quit smoking and was geographically restricted to Punjab. Other forms of tobacco use were excluded; there are likely to be many polytobacco users in Pakistan who may also have distinct sociodemographic and tobacco use characteristics. In addition, the trial excluded waterpipe smokers who had no intention of quitting and who may also have distinct sociodemographic and tobacco use characteristics. The trial did not include exclusive cigarette smokers, which meant that a comparison of dual users with this group could not be made. However, a previous study in people with lung disease in Pakistan showed differences in cigarette-only users and dual users. For example, dual users were older and had smoked for longer, and more dual users were female, had higher carbon monoxide levels and had higher nicotine-dependency scores than the cigarette-only smokers (35).

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Facteurs associés au double usage du tabac pour pipe à eau et des cigarettes chez les adultes au Pakistan

Résumé

Contexte : Les données sur le double usage du tabac pour pipe à eau et des cigarettes sont rares, notamment dans les pays où les deux sont répandus.

Objectif : La présente étude avait pour objectif d'évaluer les corrélats démographiques, les schémas de consommation et les comportements de sevrage des utilisateurs pakistanais de pipe à eau qui fument également des cigarettes.

Méthodes : Les données ont été tirées d'un essai contrôlé randomisé mené au Pakistan qui a évalué le sevrage tabagique chez 510 utilisateurs adultes de pipe à eau, avec stratification sur la consommation simultanée de cigarettes. Une analyse de régression logistique a été réalisée pour évaluer le lien entre les consommateurs de tabac pour pipe à eau qui fument également des cigarettes (double usage) et leurs caractéristiques démographiques, leurs antécédents de tabagisme et leur comportement en matière de sevrage tabagique. Des odds ratios non ajustés (OR) et ajustés (ORa) et des intervalles de confiance à 95 % ont été déterminés.

Résultats : Le double usage était significativement lié à un âge plus jeune (ORa = 0,36, IC à 95 % : 0,19-0,70) et à un niveau d'éducation correspondant au collège (11-15 ans) par rapport à l'absence d'éducation formelle (ORa = 2,01, IC à 95 % : 1,15-3,50). Le double usage était également associé à une consommation qui ne s'étendait pas sur toute la journée par rapport à une consommation sur toute la journée (définie comme continue pendant plusieurs heures) (ORa = 2,71, IC à 95 % : 1,73-4,25) et à un âge plus jeune au début du tabagisme (ORa = 0,95, IC à 95 % : 0,93-0,98). Aucun lien n'a été établi entre le double usage et le sexe, l'état matrimonial, la durée du tabagisme, la dépendance nicotinique ou l'historique des sevrages.

Conclusion : Les consommateurs de tabac pour pipe à eau qui fument également des cigarettes se différencient des consommateurs de tabac pour pipe à eau seul, surtout du point de vue des caractéristiques démographiques. Des recherches supplémentaires sont requises pour étudier l'interaction entre ces deux comportements tabagiques. Les approches de promotion de la santé et les interventions en faveur du sevrage tabagique au Pakistan devraient être adaptées en tenant compte des caractéristiques uniques des consommateurs de tabac pour pipe à eau et de cigarettes.

العوامل المرتبطة بالاستخدام المزدوج لتبغ النرجيلة والسجائر بين البالغين في باكستان

محمد جواد، عمارة دوكر،منى كنعان، جاسجيت أهلووااليا، قمران صديقي

الخلاصة

الخلفية: لا يُعرف سوى قدر ضئيل من المعلومات عن الاستخدام المزدوج لتبغ النرجيلة والسجائر، خاصة في البلدان التي ينتشر فيها تعاطيهما.

الأهداف: هدفت هذه الدراسة إلى تقييم العوامل السكانية، وأنماط الاستخدام، وسلوكيات الإقلاع التي ينتهجها متعاطو النرجيلة في باكستان الذين يدخنون السجائر أيضاً.

طرق البحث: جُمعت البيانات من خلال مجموعة تجارب عشوائية مُضبَّطة في باكستان لتقييم الإقلاع عن التدخين على مستوى ٥١٠ أشخاص بالغين يتعاطون النرجيلة، مُقسمين إلى طبقات حسب التدخين المتزامن للسجائر. وقد أُجري تحليل الانحدار اللوجستي لتقييم الارتباط بين متعاطي تبغ النرجيلة الذين يدخنون السجائر أيضاً (الاستخدام المزدوج)، وخصائصهم السكانية، وتاريخهم في تعاطي التبغ وسلوكهم في الإقلاع عنه. وتحددت نسبتا الأرجحية المُصحَّحة وغير المُصحَّحة وفواصل الثقة بنسبة ٩٥٪.

النتائج: ارتبط الاستخدام المزدوج ارتباطاً كبيراً بالسن الأصغر (نسبة الأرجحية المُصحَّحة = ٠,٣٦، فاصل الثقة ٩٥٪: ٠,١٩–٠,٧٠) والمستوى التعليمي المتوسط (١١–١٥ عاماً) (مقابل عدم الحصول على تعليم رسمي، نسبة الأرجحية المُصحَّحة = ٢,٠١، فاصل الثقة ٩٥٪: ١,٥٠–٣,١٥). كذلك ارتبط الاستخدام المزدوج بالتدخين خلال مدة أقل من يوم كامل (مقابل يوم كامل، نسبة الأرجحية المُصحَّحة = ٢,٧١، فاصل الثقة ٩٥٪: ١,٧٣–٤,٢٥) وبالسن الأصغر عند بدء التدخين (نسبة الأرجحية المُصحَّحة = ٠,٩٥، فاصل الثقة ٩٥٪: ٠,٩٣–٠,٩٨). ولم يتبين وجود أي رابط بين الاستخدام المزدوج ونوع الجنس، أو الحالة الزواجية، أو طول مدة التدخين، أو إدمان النيكوتين، أو تاريخ الإقلاع عن التدخين.

الاستنتاج: يختلف متعاطو تبغ النرجيلة الذين يدخنون السجائر أيضاً عن الذين يتعاطون النرجيلة فقط، لا سيما في الخصائص السكانية. ويلزم إجراء مزيدٍ من البحث لاستكشاف التفاعل بين هذين النوعين من سلوكيات التدخين. ويتعين على التدخلات المعنية بتعزيز الصحة والمساعدة في الإقلاعٍ عن التدخين في باكستان النظر في إمكانية مواءمة النهج الذي تسلكه لكي تأخذ بعين الاعتبار الخصائص الفريدة لمتعاطي تبغ النرجيلة بالتزامن مع تدخين السجائر (الاستخدام المزدوج).

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Cigarette affordability in the Eastern Mediterranean Region

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Abstract

Background: The World Health Organization Eastern Mediterranean Region is the only WHO region with increasing male prevalence of smoking tobacco products observed and predicted. There is no regional analysis of cigarette affordability in the literature.

Aims: This study aimed to compare the affordability of the cheapest, most sold and premium brands of cigarettes between countries of the Eastern Mediterranean Region (EMR) and countries in the rest of the world by income group in 2008 and 2018.

Methods: Affordability was defined as the percentage of GDP per capita needed to purchase 2000 cigarette sticks. A simple average and 95% confidence interval of affordability was calculated by income group for EMR countries and for the rest of the world.

Results: Historically, the cheapest, most sold and premium brands of cigarettes have on average been more affordable in the EMR compared to the same brands in the rest of the world in every income group. This pattern persists despite some convergence between the affordability of cigarettes in the EMR and in countries in the rest of the world.

Conclusion: The historic and persisting higher affordability of cigarettes in the EMR relative to the rest of the world could offer an explanation to the tobacco prevalence trends in the region. Continued implementation of Article 6 of the WHO Framework Convention on Tobacco Control is needed.

Keywords: tobacco, economics, smoking, taxation

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Introduction

Currently, tobacco use claims the lives of 8 million people globally each year. This figure is likely to increase if tobacco control measures are not implemented or further strengthened (*1*). Tobacco use is an epidemic that places a higher burden on low- and middle-income countries, where 80% of tobacco users are located (*2*).

The World Health Organization (WHO) Eastern Mediterranean Region (EMR) consists of 22 Member States (Afghanistan, Bahrain, Djibouti, Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen), with a population of nearly 679 million people (*3*). The prevalence of use of smoking tobacco products (including but not limited to cigarettes and water pipes) by males aged 15 years or older is decreasing in all WHO regions apart from the EMR, where it continues to increase (*4*). In EMR countries, approximately 14% of the population aged 15 years or more are current cigarette smokers, with prevalence noticeably higher among males (25%) when compared to females (2%) (*5*).

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) and its implementation guidelines provide an evidence-based framework for governmental action to reduce tobacco use (*6*). Article 6 of the WHO FCTC outlines the "Price and tax measures to reduce the demand for tobacco" (*6*). Effective tobacco tax policies can significantly improve health and economic outcomes for individuals, households, and the country, especially in low-income settings (*5,7–9*). Evidence shows that raising tax on tobacco increases the real price of tobacco and reduces tobacco consumption (*6*). Approximately half of the impact of a price increase is on the prevalence of use and half is on the intensity of consumption among users (*6*). Therefore, taxation must increase prices more than any growth in average income occurring at the same time in order to prevent tobacco becoming more affordable (*6*).

Research has suggested that tobacco affordability benchmarks may be more effective than tax incidence benchmarks, since tax incidence benchmarks do not respond to changes in average income (*10*). Rising incomes may undermine pre-existing high levels of taxation unless tobacco taxes are raised in response to changes in income. This argument is particularly pertinent in the case of lower middle-income countries experiencing rapid economic growth (*10*). Previous research has shown that globally the most sold brand of cigarettes in countries are becoming less affordable in upper middle and high-income countries and more affordable in low and lower middle-income countries (*5,11,12*).

The EMR is the only WHO region with observed and predicted increases in the prevalence of the use of smoking tobacco among males aged 15 years or older (4). This research analyses the affordability of cigarettes in the EMR compared to the rest of the world to determine if there are systematic differences that could shed light on this prevalence trend. Furthermore, if there is a difference between affordability in the EMR and the rest of the world, there may be a pressing need to expedite implementation of Article 6 of the WHO FCTC.

Methods

Objectives

The aims of this research was to explore if trends in the affordability of cigarettes in the EMR differ significantly from the rest of the world, and if it is an influencing factor in the current and predicted increase in the prevalence of tobacco use among males in the EMR (4). In order to address this, the affordability of the cheapest, most sold and premium brands of cigarettes was compared between countries of the EMR and countries in the rest of the world by income group in 2008 and 2018.

This research also aimed to establish if global trends in the affordability of the most sold brand of cigarettes also describe the changes in the affordability of brands of cigarettes in different market segments, in particular the cheapest and premium brand of cigarettes. Thus, the change in average affordability of the cheapest and premium brands of cigarettes between 2008 and 2018 were examined by income group to address this objective.

Data sources

The data used in this paper were taken from the biennial WHO Report on the Global Tobacco Epidemic (5). Data were collected for the report by WHO at country level over a period of 6 months, in the 18 months preceding the publication of the report (13). The cheapest, most sold and premium brands were identified and the retail prices of a pack of 20 sticks of these cigarettes were recorded from two types of retail shops in local currency units. The published data included the affordability index for the most sold brand of cigarettes (5). Using the same method as in the WHO report, the authors calculated the affordability of the cheapest and premium brands of cigarettes (5). GDP per capita data in local currency units was taken from the International Monetary Fund's World Economic Outlook database (14).

Country income groups were as defined by the World Bank in 2018 (15). However, the World Bank did not allocate an income group for Cook Islands in 2018. To classify Cook Islands, WHO applied the World Bank classification method using the most recent Gross National Income estimate from the United Nations Statistics division. All analysis was carried out by income groups as defined in 2018 to prevent comparisons capturing compositional effects of income groups, rather than the average of trends within countries in the period.

Due to missing GDP per capita, prices of the most sold brand of cigarettes data for 21 countries were excluded. Missing data on the price of the most sold brand of cigarettes meant that 4 countries were also excluded. Lack of data regarding the price of the cheapest or premium brand of cigarettes meant that 30 more countries were excluded. Sixteen countries were excluded due to inconsistencies in the data such as a higher price for the cheapest brand than the most sold brand, or cheaper price of the premium brand compared to the most sold brand. The remaining data set consisted of 125 countries. Since there were 13 low-income countries in this data set, and only one low-income country in the EMR, all low-income countries were excluded. The final sample consisted of 112 countries and included 13, 25, 16, 39, 3 and 16 countries from the Africa, Americas, Eastern Mediterranean, Europe, South-East Asia and Western Pacific regions, respectively.

Affordability: percentage of GDP per capita needed to purchase 2000 sticks of the cheapest, most sold and premium brands of cigarettes

Affordability is a measure of the ability of a person to buy a good (15). If income growth outpaces increase in prices then affordability increases. To examine the affordability of cigarettes in EMR countries compared to the rest of the world, a simple average of the affordability index was calculated per income group for EMR countries and for the rest of the world (excluding EMR countries). The results are shown with 95% confidence intervals. Affordability tends to be lower in higher income countries, and therefore affordability is examined by income group so that results are not driven by this phenomenon (2).

Results

Affordability of the cheapest, most sold and premium brands of cigarettes in EMR compared to the rest of the world by income group (Figure 1).

Historically, cigarettes in the EMR has been more affordable than cigarettes in the rest of the world. Although this pattern is lessening, it still largely persists. In 2008, the cheapest, most sold and premium brands of cigarettes in the EMR were on average more affordable than in the rest of the world in lower-middle, upper-middle and high-income countries. The difference between the affordability of the cigarettes in EMR countries and the rest of the world, for all three brands, was largest in lower-middle income countries, where it took as much as 3.95% more of GDP per capita to buy the premium brand of cigarettes on average in the rest of the world compared to the EMR. Only the difference between the affordability of cigarettes in high-income countries between EMR countries and high-income countries in the rest of the world was statistically significant at the 5% level. Brands of cigarettes in high-income countries of the EMR cost individuals between 1.16% and 1.41% less of GDP per capita to purchase compared to individuals in high-income countries in the rest of the world.

In 2018, this pattern persisted across brands and income groups, apart from the premium brand of cigarettes in upper middle-income countries, which were less affordable in EMR countries compared to upper middle-income countries in the rest of the world. An individual in upper middle-income countries of the EMR spent on average around 1.79% of GDP per capita more to buy a pack of premium brand cigarettes than a similar individual buying the premium brand in another upper-middle income country in the rest of the world. The only significant difference in affordability between the EMR and the rest of the world was in regards to the most sold brand in high-income countries, which cost on average 0.85% of GDP per capita less in EMR compared to high-income countries in the rest of the world.

Between 2008 and 2018, there was a convergence between the affordability of cigarettes in the EMR and in the rest of the world. Cigarette brands in EMR countries became on average between 0.06% to 1.17% of GDP per capita closer to the affordability of brands in the rest of the world.

In lower-middle income countries in the EMR, all the studied brands converged towards the affordability of these brands in lower-middle income countries in the rest of the world, especially the cheapest and premium brands.

In upper-middle and high-income countries the affordability of the most sold and premium brands of cigarettes converged towards the affordability of these brands in corresponding countries in the rest of the world. However, the affordability of the cheapest brand of cigarettes in upper-middle and high-income countries in the EMR diverged further from the affordability of these cigarettes in upper-middle and high-income countries in the rest of the world by 0.28% and 0.35% of GDP per capita respectively.

Global trends in the affordability of the cheapest and premium brand of cigarettes (Figure 1).

Globally, in upper-middle and high-income countries the affordability of the cheapest and premium brand of cigarettes is decreasing. The decrease in the affordability of the premium brand of cigarettes in high-income countries in the EMR of 1.02% of GDP per capita is significant at the 5% level.

In lower-middle income countries worldwide the premium brand of cigarettes are becoming more affordable and the cheapest brand of cigarette are becoming less affordable.

Discussion

In 2008, cigarettes in the EMR were more affordable than in the rest of the world and this pattern persisted in 2018, despite convergence of the affordability of cigarettes in the EMR towards the affordability of cigarettes in the rest of the world. This historic and persisting relative affordability of cigarettes in the EMR compared to the rest of the world could offer explanation to the current and predicted increase in tobacco smoking among males aged 15 years or older from the Region (4). The significant decrease in the affordability of the most sold brand of cigarettes in high-income countries of the EMR is likely due to implementation of the Gulf Cooperation Council (GCC) countries' excise tax on tobacco products (5).

The affordability of the cheapest and premium brand of cigarettes has decreased in upper-middle and high income countries and increased in lower-middle income countries globally. This shows the same pattern as the trend in the affordability of the most sold brand of cigarettes identified in the literature, suggesting that this trend is seen across market segments of the cigarette market.

Limitations

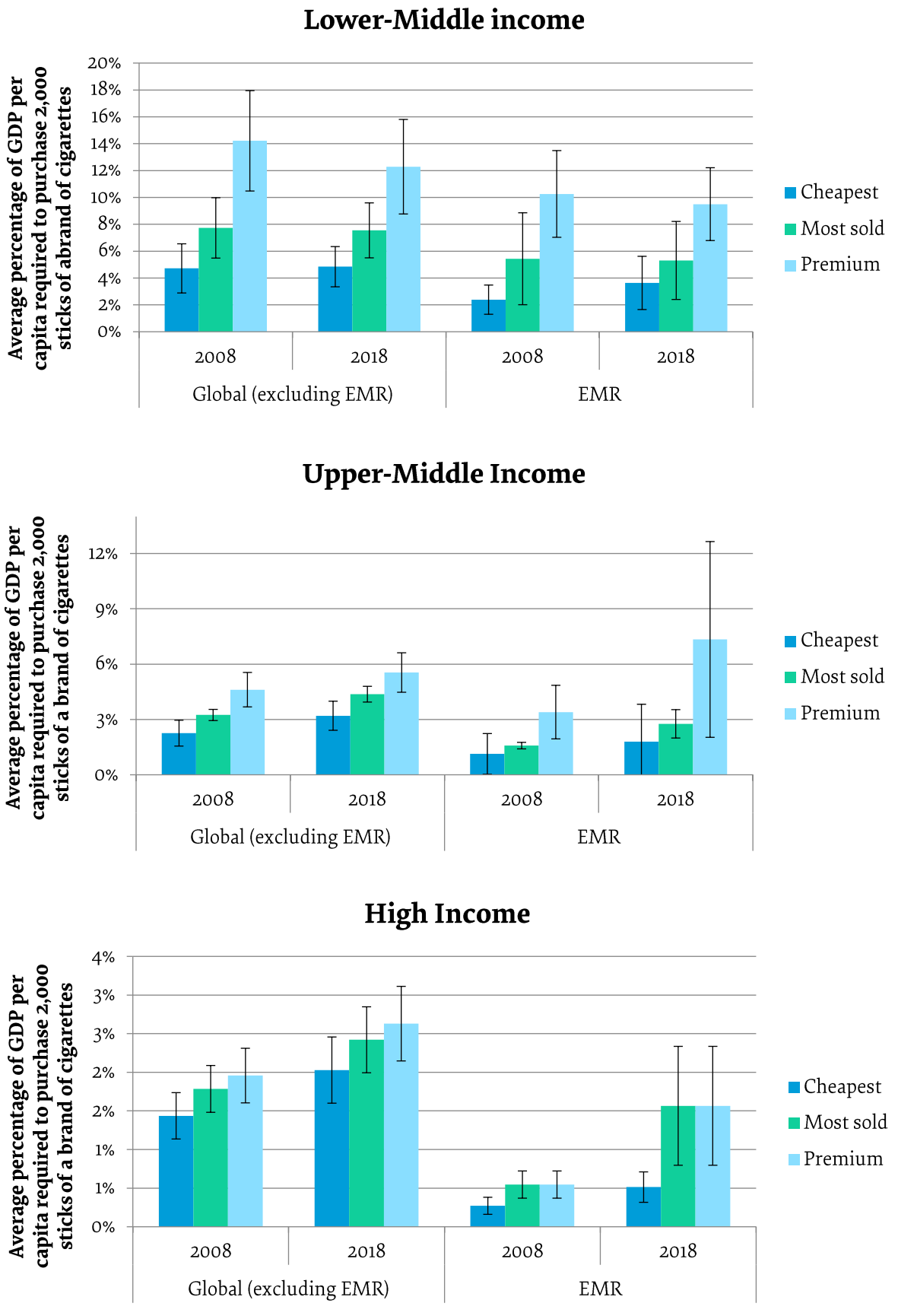
There are two main limitations to the analysis due to a lack of available data. Firstly, this research examined the affordability of the cheapest, most sold and premium brand of cigarettes in each country. Measures used should capture broad market dynamics. While using changes in affordability of three brands in each country is better than only examining one, this remains an issue. Ideally, examining a measure such as the weighted average price would allow a more comprehensive understanding of the market dynamics. Secondly, the affordability index used was the percentage of GDP per capita needed to purchase 2000 sticks of the chosen brand of cigarettes. Some research has defended the use of GDP per capita as a denominator, in particular in lower-middle income countries where there may be increased reliance on state provision, and so GDP per capita is more reflective than individual income levels (10). There is a strong case that the denominator of an affordability index should be individual income levels or wages. This would better reflect the consumption decisions faced by individuals. However, the data necessary for this index were less readily available on a global scale.

Conclusion

This research finds evidence that cigarettes in the EMR have been historically more affordable than in the rest of the world, and this trend continues despite some convergence between the affordability of cigarettes in the EMR and the rest of the world. This may offer explanation to the current and predicted increases in the use of smoking tobacco products among males in the Region (4).

The implementation of Article 6 of the FCTC should be a priority in the Region in order to reduce the affordability of cigarettes in the EMR compared to the rest of the world. This will act to decrease the prevalence of smoking and health and economic burdens of cigarettes. It is worth noting that effective implementation of Article 6 of the WHO FCTC must include actions to strengthen tax administration. While the risk of increased illicit trade following increases in tax is overstated by the tobacco industry, it is a factor that must be considered. Countries that have simultaneously strengthened tax

Figure 1 **Average affordability of cigarettes in the Eastern Mediterranean Region and the rest of the world by income group**



administration and increased tobacco taxation have seen increased tax revenue, increased tobacco prices and decreased tobacco consumption.

Funding: None.

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Accessibilité économique de la cigarette dans la Région de la Méditerranée orientale

Résumé

Contexte : La Région de la Méditerranée orientale de l'Organisation mondiale de la Santé est la seule région de l'OMS où l'on observe et prévoit une augmentation de la prévalence des produits du tabac à fumer chez l'homme. Il n'y a pas d'analyse régionale de l'accessibilité économique des cigarettes dans la littérature.

Objectifs : La présente étude visait à comparer l'accessibilité économique des marques de cigarettes les moins chères, les plus vendues et les plus haut de gamme entre les pays de la Région de la Méditerranée orientale et les pays du reste du monde, par groupe de revenus, en 2008 et 2018.

Méthodes : L'accessibilité économique a été définie comme le pourcentage du PIB par habitant nécessaire pour acheter 2000 cigarettes. Une moyenne simple et un intervalle de confiance à 95% pour l'accessibilité économique ont été calculés par groupe de revenu pour les pays de la zone de la Région de la Méditerranée orientale et pour le reste du monde.

Résultats : Historiquement, les marques de cigarettes les moins chères, les plus vendues et les plus haut de gamme étaient en moyenne plus économiquement abordables dans la Région de la Méditerranée orientale par rapport aux mêmes marques dans le reste du monde, et ce dans toutes les catégories de revenus. Ce schéma persiste malgré une certaine convergence entre l'accessibilité économique des cigarettes dans la Région et dans les pays du reste du monde.
Conclusions : Le fait que les cigarettes demeurent plus économiquement abordables de tout temps dans la Région de la Méditerranée orientale par rapport au reste du monde pourrait expliquer les tendances de la prévalence du tabagisme dans cette Région. Il est nécessaire de poursuivre la mise en œuvre de l'article 6 de la Convention-cadre de l'OMS pour la lutte antitabac.

القدرة على شراء السجائر في إقليم شرق المتوسط

ميريام جوردن، آن–ماري بيروسيتش، روبرت توتانيس

الخلاصة

الخلفية: إن إقليم شرق المتوسط لمنظمة الصحة العالمية هو الإقليم الوحيد للمنظمة الذي يزداد فيه المعدل الفعلي والمتوقع لانتشار تدخين منتجات التبغ بين الذكور. ولا يتوفر في الأدبيات تحليل إقليمي بشأن القدرة على شراء السجائر.

الأهداف: هدفت هذه الدراسة إلى مقارنة القدرة على شراء علامات السجائر التجارية الأرخص سعرًا، والأكثر مبيعًا، والأفخم نوعًا بين بلدان إقليم شرق المتوسط والبلدان في بقية أنحاء العالم حسب فئات الدخل في عامي ٢٠٠٨ و ٢٠١٨.

طرق البحث: عُرِّفت القدرة على شراء السجائر بأنها النسبة المئوية لنصيب الفرد من الناتج المحلي الإجمالي اللازمة لشراء ٢٠٠٠ سيجارة. وحُسِبَ المتوسط البسيط وفترة الثقة ٩٥٪ للقدرة على الشراء حسب فئات الدخل في بلدان إقليم شرق المتوسط وبقية العالم.

النتائج: كان طوال هذه الفترة متوسط أسعار السجائر الأرخص سعرًا والأكثر مبيعًا والأفخر نوعًا في متناول اليد في إقليم شرق المتوسط مقارنةً بنفس العلامات التجارية في بقية العالم في كل فئة من فئات الدخل. واستمر هذا النمط على الرغم من حدوث بعض التقارب في القدرة على شراء السجائر بين بلدان إقليم شرق المتوسط وبقية العالم.

الاستنتاج: إن القدرة السابقة على شراء السجائر والمستمرة حاليًا في إقليم شرق المتوسط بالنسبة لبقية العالم يمكن أن تفسر زيادة انتشار التبغ في الإقليم. ومن الضروري الاستمرار في تنفيذ المادة ٦ من اتفاقية منظمة الصحة العالمية الإطارية بشأن مكافحة التبغ.

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Factors contributing to the initiation of waterpipe tobacco smoking among Iranian women

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Abstract

Background: Using waterpipe is the most common method of tobacco consumption among Iranian females and the rate has significantly increased over the past few decades.

Aims: The purpose of this study was to determine the factors that contribute to the initiation of waterpipe tobacco smoking among females in Gorgan, Islamic Republic of Iran.

Methods: This cross-sectional study was conducted between March and June 2016 in Gorgan. Two hundred and six females who smoked waterpipe tobacco were recruited as participants using convenience and snowball sampling methods. Data were collected using a questionnaire examining the factors that facilitate initiation of waterpipe smoking among females.

Results: Positive attitudes towards waterpipe smoking and its availability were the most frequently reported factors contributing to its initiation among females (87.9%). Curiosity (80.1%) and waterpipe smoking among family members (70.9%) were also significant. The least frequently reported factor was "attracting other's attention and cooperation".

Conclusion: A positive opinion, availability, curiosity and presence of waterpipe smoking among family members and relatives were the most signifcant factors that facilitated initiation of waterpipe smoking among females. To reduce its prevalence, it is recommended that intervention strategies be implemented to change attitudes and reduce access to waterpipe tobacco at family and social gatherings.

Keywords: tobacco, waterpipe, smoking initiation, substance use, Iran

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Introduction

Waterpipe tobacco use by females has increased in recent years. Currently 250 million women smoke waterpipe tobacco (hookah) worldwide and it is estimated that this number will reach to 532 million in the near future (*1*). There are currently no accurate statistics regarding the prevalence of waterpipe smoking among females in the Islamic Republic of Iran. Even though waterpipe smoking is generally more common among males, in the south of the country it is more prevalent among females. For example, a study conducted in Hormozgan province reported that 28.4% of males and 45.2% of females smoked waterpipe tobacco (*2*). Furthermore, the rate of waterpipe smoking was 4.4 times greater in females (*2*), while a population-based study in Bandar Abbas revealed a statistically significant difference ($P < 0.0001$) in the prevalence of waterpipe smoking among males (4.6%) and females (13.6%) (*3*). The prevalence of water-pipe smoking among Iranian females has also increased dramatically (*4,5*). In a population-based study, 6.3% of females of reproductive age in the capital Tehran smoked waterpipe tobacco (*4*), while another study found that 11.3% of females over the age of 15 years in the capital were waterpipe smokers (*5*).

Waterpipe smokers are either unaware of the harmful effects or do not consider them as detrimental as the effects of cigarette smoking. However, it has been shown that there is a significant correlation between waterpipe smoking and lung cancer, chronic lung disease, gingivitis and periodontal disease, and lower birth weight (*6*). Also, one session of waterpipe smoking produces more nicotine and carbon monoxide than smoking one cigarette, and generates 40 times more smoke (*6*). Females are more susceptible to the harmful effects of carcinogens in tobacco products, and the chances of developing chronic obstructive pulmonary disease (COPD) are greater in females than males (*7,8*). Due to the increasing prevalence of waterpipe smoking globally, the World Health Organization (WHO) has highlighted significant research on smoking patterns and the factors that facilitate the initiation of waterpipe smoking in different countries and among various cultures (*9*).

Gorgan is the capital city of Golestan province in the north of the Islamic Republic of Iran and attracts many visitors from inside and outside the province. Recent field observations have shown that the prevalence of smoking in this city, especially in its recreational areas, is on the rise. Thus, the purpose of this study was to determine the factors that contribute to the initiation of waterpipe smoking among females in the city.

Methods

Sample

This cross-sectional study was conducted between March and June 2016 on 206 participants. The aim of the study was explained to the participants, who were assured of its confidentiality and no information pertaining to participants' identities was collected. Inclusion criteria were being female, either being a waterpipe smoker or having a history of smoking waterpipe tobacco, and able to communicate through reading and writing. Convenience and snowball sampling methods were used for selecting the participants. Researchers, who were students of public health, visited traditional restaurants and cafes in Gorgan and approached women who were smoking waterpipe tobacco. After explaining the aim of the study and once the individuals agreed to participate, the researchers distributed the questionnaires. Due to the limited access to study samples, the participants were asked to encourage their waterpipe tobacco-smoking friends or relatives to participate in the study as well.

Ethical clearance

The study protocol was reviewed and approved by the Regional Committee of Ethics at Golestan University of Medical Sciences (Ethical code: IR.GOUMS.REC.1395.85).

Measurements

The data were collected using a questionnaire developed by Baheiraei et al. for examining the factors that contribute to initiation of waterpipe smoking among females (*10*). The questionnaire had been designed by a mixed method study and its reliability and validity have been approved (*10*). In their qualitative study on female waterpipe-smokers in Tehran, Baheiraei et al. showed that a positive opinion of waterpipe tobacco, family and social facilitators, and sensory attraction of waterpipe tobacco were the main factors contributing to initiation of waterpipe tobacco use among females (*11,12*).

In the present study, the reliability of the questionnaire was calculated using Cronbach's alpha ($\alpha = 0.884$). The questionnaire had 3 sections: 1) demographic questions, 2) questions regarding the pattern of waterpipe smoking, and 3) questions regarding the factors that contribute to initiation of waterpipe tobacco use. The third section had 6 subscales and 20 questions in total using a 7-point Likert scale. The subscales included: attracting other's attention and cooperation (7 questions); the need for recreation and relaxation (3 questions); waterpipe smoking among family and relatives (2 questions); availability of waterpipe tobacco (2 questions); curiosity (2 questions); and having a positive opinion of waterpipe tobacco use (4 questions). Participants responded by choosing one of the 7 options (completely agree, somewhat agree, agree, neutral, disagree, somewhat disagree, and completely disagree) and their score ranged from 7 to 1. An average score was calculated for each subscale. The mean and standard deviation values along with frequency and percentages were calculated using SPSS, version 16.

Results

Table 1 shows participants' demographic profile. Participants were 15–46 years old, mean 26.0 (SD 5.7) years. The majority of the participants (94.7%) were living in the city. Approximately 46% were employed, 30.1% were housewives, and 23.8% were unemployed. Almost half of the females (49%) were married. In terms of ethnicity, 84.4% of participants were Fars, 8.3% Turkmen and 7.3% Turk. Approximately 65% had a university degree. Participants were aged 10–39 years old (mean 20 [SD 4.5]) when initiating waterpipe smoking. The vast majority of participants (87.9%) had smoked waterpipe tobacco during the previous months.

The results showed that 45.1% of the participants had smoked waterpipe tobacco at least 50 times during their lifetime; 4.4% smoked on a daily basis, and 11.7% had smoked 16–20 times in the previous month (Table 2). For most females, the smoking pattern was occasional, i.e., at least once a month (33.8%) or at least once a week (31.4%). Sixty-four participants (30.9%) had been smoking waterpipe tobacco for more than 4 years.

The most frequently reported cause of waterpipe smoking among females was "the availability of hookah"

Table 1 Demographic profile of female study participants in Gorgon, Islamic Republic of Iran, *n* = 206

Characteristic	No.	%
Marital status		
Single	101	49
Married	89	43
Engaged	7	3.5
Widow	7	3.5
Divorced	2	1
Living with		
Spouse & children	79	38.5
Parents	68	33.2
Friends	30	14.2
Mother	13	6.4
Alone	11	5.3
Children	4	1.9
Father	1	0.5
Education		
Primary school	5	2.4
Secondary school	6	2.9
Dropped out of high school	43	20.9
High school	19	9.2
Associate degree	36	17.5
Bachelor's degree	88	42.7
Master's degree	9	4.4
Ethnicity		
Fars	174	84.4
Turkmen	17	8.3
Turk	15	7.3

Table 2 Pattern of waterpipe tobacco use among females in Gorgon, Islamic Republic of Iran, *n* = 206

Pattern	Participants	
	No.	%
Frequency of waterpipe tobacco use during whole life		
Once	11	5.3
2–5 times	18	8.7
6–25 times	47	22.8
26–50 times	37	18
50+ times	93	45.1
Frequency of waterpipe tobacco use in the previous month		
0 day	27	13.1
1 day	66	32.1
3 days	50	24.3
6 days	22	10.7
10 days	19	9.2
20 days	13	6.3
30 days	9	4.4
Frequency of waterpipe tobacco use in the last month		
0 time	26	12.5
1–2 times	70	34
3–5 times	52	25.2
6–9 times	18	8.8
10–15 times	16	7.8
16–20 times	24	11.7
Current waterpipe tobacco use pattern		
At least once a year but not every month	40	19.3
At least once a month but not every week	70	33.8
At least once a week but not every day	65	31.4
At least once a day and most days a week	32	15.4
Duration of waterpipe tobacco use		
< 6 months	21	10.1
6 months to 1 year	26	12.6
1–< 2 years	34	16.5
2–< 3 years	32	15.4
3–< 4 years	30	14.5
≥ 4 years	64	30.9

and the least frequently reported cause was "attracting others' attention and cooperation" (Table 3).

A positive opinion of waterpipe tobacco use (specifically the factor "I thought hookah smoking was fun"), and availability of waterpipe tobacco (specifically the factor "In our friendly gatherings, we smoked hookah") were the most frequently reported causes (87.9%). Curiosity was the next most frequently reported factor – "I wanted to experience hookah smoking" and "I was curious to find out how it feels to smoke hookah" were mentioned by 80.1% and 72.9% of participants, respectively.

When asked about their attitude towards waterpipe smoking, a frequent response (76.2%) was "I thought hookah smoking is not addictive and I could quit whenever I wanted to". The factor "I thought people do not view hookah smoking of women as bad as their cigarette smoking" related to the subscale "attracting others' attention and cooperation" was also a frequent response (70.5%). In the "smoking hookah in family and among relatives" subscale, both factors had a high frequency, above 70%, which highlights the impact of family views and habits on individual waterpipe-smoking behaviour.

The least frequently reported factor contributing to waterpipe smoking among females was related to the "attracting others' attention and cooperation" subscale. Only 15% of the participants reported that fear of upsetting their friends and relatives by turning down their offer of waterpipe smoking had contributed to their decision to smoke waterpipe tobacco.

Discussion

The results of this study show that having a positive opinion of waterpipe tobacco use and its availability were important factors contributing to the initiation of waterpipe smoking among females. In the Islamic Republic of Iran, waterpipe tobacco is routinely available in recreation centres, which are often frequented by young people, and therefore access to waterpipe tobacco is widespread. The temporary pleasure that comes from its use, the mistaken belief that waterpipe tobaco use is not addictive and can be easily quit at any time, lack of evidence on the detrimental effects of second-hand smoke, and the perceived lower risk of smoking waterpipe tobacco in comparison with cigarette smoking were the most important factors shaping a positive opinion of waterpipe smoking among participants. While cigarette smoking is not considered an acceptable behaviour for a female in this cultural setting, waterpipe tobacco use does not attract such negative social views and is an important factor behind waterpipe tobacco use. However, previous research has shown that the amount of nicotine in waterpipe tobacco is at least equal to that in cigarettes, and can still lead to addiction (5). Moreover, waterpipe tobacco use may lead to cigarette smoking and other forms of tobacco consumption (13).

The mistaken belief that waterpipe tobacco use is less harmful than cigarette smoking is supported by similar findings in other studies. In a qualitative study on females aged 18–30 years in Canada, the perceived lower risk of waterpipe tobacco use in comparison with cigarette smoking was an important factor contributing to initiation behaviour (14), while in a Turkish study, 91% of waterpipe smokers did not believe they were addicted (15), and in a 2017 Iranian study, the majority of the participants (71.1%) did not consider themselves addicted to waterpipe tobacco (16). In fact, most people believe waterpipe tobacco use is less addictive than cigarettes and smoking cessation is easy (17).

A study on the smoking behaviour of students in Florida, USA, found that having a positive opinion of waterpipe tobacco use increases the probability of

Table 3 Factors contributing to waterpipe tobacco use among females in Gorgon, Islamic Republic of Iran, *n* = 206

Cause of waterpipe tobacco smoking initiation	No.	%	Mean	Standard deviation
Having a positive opinion of waterpipe smoking	–		5.20	1045
I thought waterpipe smoking was less harmful than cigarettes	124	60.3	4.65	2.22
I thought waterpipe smoking was not addictive and I can quit whenever I want	157	76.2	5.33	1.98
I saw no problems or illnesses in people who have been waterpipe smoking that would make me think negatively about waterpipe smoking	141	68.4	4.92	1.86
I thought smoking waterpipe smoking was fun	181	87.9	5.90	1.41
Curiosity	–		5.58	1.42
I wanted to experience waterpipe smoking	165	80.1		
I was curious to find out how it feels to smoke waterpipe tobacco	150	72.9	5.47	1.59
I needed recreation and relaxation	–		4.07	1.86
I needed recreation and amusement	106	51.4	4.39	2.18
I wanted to spend my leisure time waterpipe smoking	93	45.2	3.94	2.16
I wanted to reduce my stress and anxiety by waterpipe smoking	94	45.6	3.89	2.22
Attracting others' attention and cooperation	–		3.39	1.46
To be like others, I chose waterpipe smoking over cigarettes	81	39.4	3.82	2.32
I noticewhen someone is waterpipe smoking, he/she gets accepted better by others (friends and relatives)	78	37.8	3.57	2.25
I notice that waterpipe smoking has become a fashion	95	46.1	3.94	2.09
I thought people did not view women waterpipe smoking as badly as cigarette smoking	145	70.5	5.18	1.90
If I did not smoke waterpipe tobacco, my friends would have thought negatively of me	32	15.5	2.46	1.84
I was afraid that if I turned down the offer of waterpipe smoking (friends and relatives), they would be upset with me	31	15.0	2.41	1.79
I thought I could attract others' (friends and relatives) attention by waterpipe smoking	32	15.6	2.36	1.86
Waterpipe smoking behaviour of family members and relatives	–		5.10	1.92
Some of my female relatives enjoy waterpipe smoking	162	78.7	5.27	1.98
Some of my family members enjoy waterpipe smoking	146	70.9	4.94	2.24
Availability of waterpipe tobacco use	–		5.90	1.32
Access to waterpipe smoking is easily available in recreational centres	166	80.5	5.69	1.65
We enjoy waterpipe smoking in social gatherings	181	87.9	6.11	1.45

smoking by a factor of 4.32, and a negative opinion decreases the probability by a factor of 0.64. However, having a positive opinion also increases the chance of smoking in the future by a factor of 9.31 (*18*).

Waterpipe smoking in social gatherings and the ease of access to waterpipe tobacco in recreational centres were among the most important factors contributing to its initiation. Compared to active social pressure, indirect pressure has a significantly greater impact on the rate of waterpipe smoking initiation among students (*19*), namely, socialization with waterpipe smoker friends (*19,20*). Curiosity was also found to be one of the most important factors facilitating the initiation of waterpipe tobacco use among females (*21*).

The presence of family members and relatives who smoked waterpipe tobacco is also a contributing factor to the encouragmeent of non-smoking family members to try waterpipe smoking. In a study among female Saudi Arabian students, the main factor that led to starting waterpipe tobacco use was the smoking behaviour of sisters or friends (*22*). In another study, daughters of fathers who smoked waterpipe tobacco had a greater tendency to try it and a more positive opinion of the practice (*23*). The findings also showed that there is greater social acceptance of females to smoke waterpipe tobacco than cigarettes (*21*). Previous research in the Region has shown that, for religious reasons, waterpipe tobacco smoking is more acceptable among Arab women than cigarette smoking, and this has led to a greater uptake of the habit (*24*). The need for recreation and relaxation was another factor that contributed to waterpipe tobacco smoking among the sample participants. For example, in a study in the city of Ardabil, medical students were found to enjoy waterpipe smoking to relax socially with friends (*20,25*).

This study has a number of limitations which may affect the generalizability of its findings to all Iranian females, namely the convenience and snowball sampling design and sample size. However, this design was chosen because tobacco use among Iranian females is a still a culturally sensitive issue. Moreover, At the time of the study, waterpipe tobacco use in restaurants and cafes was banned by the government, hindering the ease of access to potential participants. Future studies should examine factors contributing to waterpipe tobacco use behaviour among females using a larger sample size.

Conclusion

The findings suggest that multiple important factors facilitate the initiation of waterpipe tobacco use among females. These include access to waterpipe tobacco use, a positive opinion of waterpipe tobacco use (e.g. perceived lower risk of addiction and adverse health side effects when compared with cigarettes), curiosity, the need for recreation and relaxation, the stress-releasing effect of waterpipe tobacco use, low social stigma, peer pressure, and waterpipe tobacco use among family members and friends.

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Facteurs contribuant à la mise en place d'un tabagisme par pipe à eau chez les femmes iraniennes

Résumé

Contexte : La pipe à eau est la méthode de consommation de tabac la plus répandue parmi les femmes iraniennes et le taux de consommation a considérablement augmenté au cours des dernières décennies.

Objectifs : L'objectif de la présente étude était de déterminer les facteurs qui contribuent à la mise en place d'un tabagisme par pipe à eau parmi les habitantes de Gorgan (République islamique d'Iran).

Méthodes : La présente étude transversale a été menée entre les mois de mars et de juin 2016 à Gorgan. Nous avons recruté 206 fumeuses de pipe à eau comme participantes. Ces dernières ont été sélectionnées à l'aide des méthodes d'échantillonnage de commodité et boule de neige. Les données ont été collectées au moyen d'un questionnaire portant sur les facteurs qui facilitent l'initiation d'un tabagisme de ce type chez les femmes.

Résultats : Les attitudes positives vis-à-vis de la pipe à eau et de sa disponibilité constituaient les facteurs les plus fréquemment rapportés qui contribuaient à la mise en place d'un tabagisme par pipe à eau chez les femmes (87,9 %). La curiosité (80,1 %) et l'utilisation de la pipe à eau au sein de la famille (70,9 %) étaient également des facteurs importants. Le facteur le moins fréquemment rapporté correspondait à l'énoncé : « attirer l'attention et susciter l'aide de l'autre ».

Conclusions : L'attitude positive, la disponibilité, la curiosité et l'existence d'un tabagisme par pipe à eau au sein des membres de la famille et des proches constituaient les facteurs les plus importants qui facilitent la mise en place de ce type de tabagisme chez les femmes. Afin de réduire la prévalence de ce tabagisme chez les femmes, nous recommandons la mise en oeuvre de stratégies d'intervention visant à modifier les attitudes et à réduire l'accès au tabac pour pipe à eau lors des réunions en famille et des rencontres sociales.

العوامل التي تُسهم في بدء تدخين النرجيلة بين النساء الإيرانيات

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الخلاصة

الخلفية: يُعتبر تدخين النرجيلة أكثر طرق تعاطي التبغ انتشاراً بين النساء الإيرانيات، وقد ارتفع معدل تدخينها ارتفاعاً كبيراً على مدار العقود القليلة الماضية.

الأهداف: تمثل الغرض من هذه الدراسة في تحديد العوامل التي تُسهم في بدء تدخين النرجيلة بين النساء في جرجان.

طرق البحث: أُجريت هذه الدراسة الشاملة لعدة قطاعات في الفترة بين مارس/ آذار ويونيو/ حزيران ٢٠١٦ في جرجان. وقد استعنّا بعدد ٢٠٦ نساء من مدخنات النرجيلة للمشاركة في هذه الدراسة. واُختِير هؤلاء النساء بأسلوب أخذ العينات الملائمة وأسلوب كرة الثلج لأخذ العينات. وقد جُمعت البيانات عن طريق استبيان لتحديد العوامل التي تُيسر بدء تدخين النرجيلة بين النساء.

النتائج: كانت النظرة الإيجابية تجاه النرجيلة وتوافرها أكثر ما ذُكر من العوامل التي تُسهم في بدء تدخينها بين النساء (٩ , ٨٧٪). ومن ضمن العوامل المهمة أيضاً كان الفضول (١ , ٨٠٪)، وتدخين النرجيلة بين أفراد الأسرة (٩ , ٧٠٪). أما "جذب انتباه الآخرين والتعاون" فكان من أقل العوامل المذكورة.

الاستنتاج: جاءت النظرة الإيجابية تجاه تدخين النرجيلة، وتوافرها، والفضول إزائها، وتدخينها بين أفراد الأسرة والأقارب ضمن أهم العوامل المذكورة التي تُيسر بدء تدخين النرجيلة بين النساء. ولتقليل معدل انتشار تدخين النرجيلة بين النساء، نوصي ببعض استراتيجيات التدخل التي تُغير النظرة إلى النرجيلة وتقلل إمكانية الوصول إليها في تجمعات الأسرة والأصدقاء.

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Tobacco use and its associated factors among older people: a community-based study in Egypt

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Abstract

Background: Smoking is a major health risk and tobacco use is common in all age groups in Egypt. In older people, tobacco use is considered the primary preventable cause of disability and death. Few studies have considered tobacco use in older people and its associated factors.

Aims: This study aimed to estimate the prevalence and type of tobacco use among older people in Mansoura, Egypt.

Methods: A cross-sectional descriptive population-based study was carried out in Mansoura District (both urban and rural areas). It included 663 older people aged 60 years or over. Data were collected from interviews at participants' homes using a questionnaire covering family sociodemographic details, tobacco smoking history, nicotine addiction scale, and religious commitment inventory.

Results: The prevalence of active current tobacco smoking among participants was 25.3%, passive smoking was 37.1%, while 6.3% were ex-smokers. Among active current smokers nicotine dependence was 42.3%, and 23.3% had failed to quit smoking, while 30.3% had the intention to quit. Logistic regression analysis revealed that being male, having low levels of education and religiosity, and urban residence were the independent predictors of current smoking.

Conclusion: The prevalence of both active and passive tobacco smoking among older people was considered high compared to high-income countries. The most important factors associated with smoking status were sex, education and religiosity. There is an urgent need for anti-tobacco campaigns and smoking cessation interventions specifically targeting older people.

Keywords: smoking, tobacco, nicotine dependence, substance use, Egypt

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Introduction

Tobacco use is recognized as one of the biggest public health threats and the primary cause of noncommunicable diseases and premature death in low and middle-income countries (*1*). It is estimated that 71% of lung cancers, 42% of chronic respiratory diseases and nearly 10% of cardiovascular diseases are due to tobacco smoking (*2*), while also increasing the risk of communicable diseases such as tuberculosis and lower tract respiratory infections, and decreasing life expectancy (*3,4*). According to the Egypt Global Adult Tobacco Survey (2009), Egypt is listed as one of the top ten per capita consumers of tobacco, where nearly 20% of the population use at least one form of tobacco (*5*), primarily cigarettes (16%), waterpipe (3.3%) and chewing tobacco (2.6%).

Tobacco use among older people is of particular public health concern, noting the high prevalence in Egypt with regard to elderly citizens (*6*), who are at a greater risk of side effects associated with long-term tobacco use (*7*). Smoking tobacco is associated with a higher risk of cognitive impairment and dementia in older people (*8*) and has also been linked to many sensory disabilities (*9*), as well as loss of function, mobility and independence (*10*). Furthermore, it is associated with age-related diseases in older women such as osteoporosis and breast cancer (*11*). Lastly, quitting smoking tobacco is more difficult with advancing age due to significant and prolonged nicotine dependence (*12*).

Although many studies have focused on tobacco use among adolescents and adults, the literature is lacking when examining tobacco use in older and retired people. This study aimed to estimate the prevalence and type of tobacco use among older people in Mansoura, Egypt.

Methods

This study was carried out in Mansoura District (both urban and rural areas). Mansoura city is the capital of Dakahlia Governorate in Egypt and is considered the base of the Nile Delta, and home to 6.8% of the total population of the country (*13*). This cross-sectional descriptive population-based study was conducted between 1 June and 31 August 2017, and targeted the population of older citizens aged 60 years or over.

Sample size was calculated using the Medcalc program (http://www.medcal.org). A pilot study on 50 older persons (not included in the full-scale study)

revealed that 20% were current smokers. Using an alpha error of 0.05, study power of 80% and 5% precision, the sample size was re-calculated to be 430, and then multiplied by 1.5 to compensate for the design effect of the cluster sampling method. Thus, the final sample size was 645.

The sample was distributed proportionally between rural and urban areas (2:1). Lists of all health centres in urban areas (n=11) and rural areas (n=38) were selected using a simple random sample technique, whereby investigators selected each second and each fourth health centre from urban and rural lists respectively. Older people were selected using a cluster sampling method. The catchment area of each selected health facility was divided into 33 clusters (households), whereby each cluster includes 20 older persons. One or more clusters from each area could be selected depending on the population size and age composition. A total of 692 older people were approached, of which 663 completed the questionnaire (response rate of 95.8%).

Data were collected from interviews at participants' homes at times arranged by nurses affiliated with the local health facility. The study questionnaire covered the socio-demographic data of the older person and associated family, tobacco smoking history, nicotine addiction scale, and religious commitment inventory.

The socioeconomic scale of El-Gilany et al. (2012) was used to assess the socio-economic status of the family (*14*). This validated scale includes education level and occupation of husband and wife, income adequacy and sources, household possessions, and housing conditions. The quartile values of the total score were used to define the four social status levels.

Tobacco smoking history included age of initiating smoking, smoking duration, type of tobacco (e.g. cigarette, waterpipe, cigar, passive smoking at home and/or work), number of cigarettes (or other) smoked per day, trial to quit, intention to quit, as well as ex-smoking and its duration and reasons. Current smoking is divided into active and passive. Active smoking is defined as the use of any form of tobacco during the past three months on a daily basis. Passive smoking is the exposure to secondhand tobacco at home and/or work, and current exposure was defined as being in the same room with a smoker for at least an hour/ day for 12 consecutive months or more (*15*).

The smoking index was calculated according to Indryan (2008), which incorporates age of initiating smoking, duration of smoking, type of tobacco use, passive smoking, number of cigarettes (or others) smoked per day, and number of years elapsed since quitting (*16*). Values less than zero were not considered relevant.

The Arabic Version of the Fagerstrom Test for Nicotine Dependence (FTND), translated and validated by Kassim et al. (2012), was used for measuring nicotine dependence among current tobacco users (*17*). The test consists of six items with a score ranging from 1 to 10. A score of 5 or more indicates a significant dependence, while a score of 4 or less shows a low to moderate dependence (Heatherton et al.) (*18*).

The Religious Commitment Inventory (RCI-10) consists of 10 items answered on a 5-point Likert scale; a full-scale score of ≥38 considers a person to be highly religious (*19*). The English version of RCI-10 was translated to Arabic by two bilingual Egyptian researchers, then back-translated into English by another two translators who were unaware of the English version. The Arabic version was tested during the pilot study and found to be reliable (interclass correlation range 0.72–0.97; Cronbach alpha = 0.73).

Data were analysed using SPSS Version 16. Chi square was used to test the significance in bivariate analysis, and crude odds ratios (COR) and their 95% CI were calculated. Variables significantly associated with smoking in bivariate analysis were entered into a multivariate logistic regression model using forward Wald method. Adjusted OR and their 95% CI were calculated; $P < 0.05$ was considered statistically significant.

Ethical considerations

The study was approved by the Institutional Review Board of the Faculty of Medicine, Mansoura University, Egypt. Verbal consents were obtained from older persons after explanation of the purpose and nature of the study. Confidentiality of data and privacy were assured.

Results

The age of study participants ranged from 60 to 85 years with a mean of 67.3 ±7.1 years. Table 1 indicates the number and prevalence of active current smoking (168, 25.3%) and passive smoking (246, 37.1%). Among active current smoking, cigarettes smoking is the most prevalent followed by waterpipe smoking. Ex-smokers (not currently passive smokers) totaled 42 (6.3%) participants. Among those current and ex-smokers (ever smokers), the highest calculated smoking index was 20 to <40, and the lowest was ≥40. Among active current smokers, significant nicotine dependence was recorded in 71 (42.3%) participants, failed trial-to-quit was recorded in 39 (23.3%) participants, while 51 (30.3%) participants had the intention to quit.

Table 2 illustrates sociodemographic characteristics and their association with tobacco smoking among older people. Being male significantly increases the risk of tobacco smoking [COR (95% CI) = 4.8 (3.3–7.2), $P < 0.001$]. In addition, illiteracy, living in urban areas, low level of religiosity and presence of a family member who smokes tobacco are associated with statistically significant increased risk of tobacco smoking among older people [COR (95% CI) = 2.2 (1.5–3.3), 2.7 (1.9–3.9), 3.0 (2.0–4.4) and 2.1 (1.5-3.0), $P < 0.001$, respectively].

The logistic regression (Table 3) revealed that the most powerful independent predictors were being male and illiterate [AOR= 6.4 (95% CI = 4.0–10.2) and (3.8–10.9), respectively]. Other independent predictors were low religiosity (3.6 times increase compared to high religiosity) and urban residence (1.9 times increase compared to rural residence).

Table 1 Overall pattern of tobacco smoking in 663 older people in Mansoura, Egypt

Characteristic	no. (%)
Current smokers*	
Active smoking (any tobacco form):	168 (25.3)
Cigarettes smoking	143 (21.6)
Waterpipe smoking	54 (8.1)
Cigar/pipe smoking	7 (1.1)
Passive smoking	246 (37.1)
Pure passive smoking	79 (11.9)
Combined (active and passive)	167 (25.2)
Total current smokers**	247 (37.6)
Ex-smokers	42 (6.3)
Smoking index (289)*** (among ever smokers)	
0	62 (21.5)
<20	86 (29.8)
20–40	101 (34.9)
>40	40 (13.8)
Median (min–max)	28.1 (0–73.2)
Significant nicotine dependence****	71 (42.3)
Failed trial-to-quit****	39 (23.2)
Intention to quit****	51 (30.3)
Never active smokers	453 (68.3)

*Categories are not mutually exclusive

**168 active smokers + 79 pure passive smokers = 247

*** % ever smokers (current, ex-smokers)

****% current active smokers

Discussion

Although tobacco smoking among older people is an important and potentially preventable health issue, few epidemiological studies from the Region have assessed the patterns of smoking exposure among this group. In the present study, the overall prevalence of current smoking among participants aged ≥ 60 years was 25.3%; this was similar to rates reported by two Brazilian studies where the overall prevalence of smoking among retired individuals were 26% and 23% among older people (*20,21*). However, lower rates were reported from other studies. For example, the overall smoking prevalence in older people (≥65 years) in Europe was 11.5% (*22*). In the United States of America, It was estimated in 2005 that 9.1% of adults age 65 years and older were current smokers (*6*). In Korea, the overall smoking prevalence in older people (≥65 years old) was 11.9% (*23*). In the present study, the prevalence of passive smoking was 37.1%, which is similar to rates reported from other studies; for example, in Italy where 33% of older people (≥65 years old) were exposed to indoor passive smoking (*24*), while a study from China reported a prevalence of passive smoking in the same age group of 30.5% (*25*).

Nicotine is the major chemical component that is responsible for addiction, which is dependent on nicotine amount, the means of delivery and the rate of absorption (*26*). In this study, 42.3% of participants were significantly nicotine dependent based on the FTND score; this is much higher than previous study results from other countries. For example, significant nicotine dependence was 25.9% in older people in Brazil (*21*), 23% in a European study (*22*) and 13.4% in Italy (*27*).

Overall, 23.2% of the current smokers in this study had at least one failed trial-to-quit smoking. This was higher than the rate of failed attempt-to-quit smoking (15.2%) in one study from India (*28*), and lower compared to the result of a meta-analysis of tobacco smoking in older people where 36.9% had made an attempt to quit tobacco use in the past 1 year (*11*). However, frequent failed quitting reflects the high rate of significant nicotine dependence and /or the lack of proper counseling, support and even medical help needed during the quitting process.

Tobacco smoking is motivated by a complex relationship between environmental, personal, and psychosocial factors and the biological effects of nicotine (*29*). Still, 30% of participants in this study had the intention to quit. In other studies, 36% of older people who smoked tobacco had an intention to quit within the following 6 months (*30*). However, in 2 other studies approximately half of the study sample demonstrated low motivation to stop smoking (*7,21*).

The majority of reviewed studies noted that the prevalence of smoking in older people decreases as age increases (*20,30,31*), falling to only 8% among those aged ≥75 years (*27*). In the present study, the prevalence of smoking was almost equal among different age groups, namely 26.5%, 23.4% and 25.5% in individuals aged 60–<70, 70–<80 and ≥80 years, respectively. This indicates the weak implementation and /or poor effectiveness of smoking cessation programmes for older people.

On stratifying the prevalence of smoking by sex, this study found that it was significantly higher in males than females (12.3% and 40.5%, respectively) and being male is the strongest risk factor for smoking in older people. This concurs with previous reports from other countries (*7,20,22,30*). A previous study on the prevalence of tobacco use among adults in Egypt detected higher rates of smoking among males than females (*32*). The observation of the current study may be due to cultural barriers and the social perception of tobacco use by females, which inhibits smoking or at least hinders the disclosure of the actual smoking practice.

As demonstrated in other research (*21*), marital status is not associated with current tobacco use among older people. A significant inverse relationship between education level and prevalence of current smoking is observed in the current study, which is supported by other research (*25,33*). Moreover, a lower educational level is a significant independent predictor for current smoking in older people. In addition, a low level of religiosity is indicated to be a significant independent predictor for smoking among older people and could be attributed to the non-observance of numerous religious edicts that declare smoking to be prohibited in Islam (*34*).

Table 2 Prevalence of tobacco smoking and its variation with sociodemographic characteristics

	Total	Smoking no. (%)	P	COR (95% CI)
Overall	663	168 (25.3)		(22.02–28.7)
Age (years)				
60–70	355	94 (26.5)		1(r)
70–80	214	50 (23.4)	0.4	0.8 (0.6–1.3)
>80	94	24 (25.5)	0.9	0.95 (0.6–1.6)
Sex				
Female	357	44(12.3)	£	1(r)
Male	306	124(40.5)		4.8 (3.3–7.2)
Marital status				
Divorced/single	40	6 (15.0)		1(r)
Married	493	136 (27.6)	0.1	2.2 (0.9–5.3)
Widow	130	26 (20.0)	0.5	1.4 (0.5–3.7)
Level of education				
Secondary and above	235	47 (20.0)		1(r)
Less than secondary	178	32 (18.0)	0.6	0.9 (0.5–1.4)
Illiterate	250	89 (35.6)	£	2.2 (1.5–3.3)
Residence				
Rural	443	83 (18.7)		1(r)
Urban	220	85 (38.6)	£	2.7 (1.9–3.9)
Living condition				
Alone	32	10 (31.2)		1(r)
With family	631	158 (25.0)	0.4	0.7 (0.3–1.6)
Religiosity				
High	289	42 (14.5)		1(r)
Low	374	126 (33.7)	£	3.0 (2.0–4.4)
Currently working				
No	619	150 (24.2)		1(r)
Yes	44	18 (40.9)	0.014	2.2 (1.2–4.1)
Income				
Adequate	324	76 (23.5)		1(r)
Not adequate	188	58 (30.9)	0.1	1.5 (0.97–2.2)
More than adequate	151	34 (22.5)	0.5	0.9 (0.6–1.5)
Socioeconomic status				
Very low	150	34 (22.7)		1(r)
Low	151	35 (23.2)	0.9	1.03 (0.6–1.8)
Middle	214	56 (26.2)	0.4	1.2 (0.7–2.0)
High	148	43 (29.1)	0.2	1.4 (0.8–2.4)
Smoking family member				
No	342	64 (18.7)		1(r)
Yes	321	104 (32.4)	£	2.1 (1.5–3.0)

COR=crude odds ratio

CI=Confidence interval

Table 3 Multivariate logistic regression analysis of independent predictors of tobacco smoking

	β	P	AOR (95% CI)
Sex			
Female	–		1(r)
Male	1.9	£	6.4 (4.0–10.2)
Religiosity			
High	–		1(r)
Low	1.3	£	3.6(2.2-6.0)
Residence			
Rural	–		1(r)
Urban	0.6	0.004	1.9 (1.2–2.9)
Education			
Secondary & above	–		1(r)
Less than secondary	0.5	0.09	1.7 (0.9–3.0)
Illiterate	1.9	£	6.4 (3.8–10.9)
Constant	−4.4		
Model χ^2	182.0, ≤0.001		
Percent correctly predicted	81.4		

AOR=Adjusted odds ratio

CI=Confidence interval

χ^2 Percent correctly predicted 81.4

Conclusion

According to this study, active and passive smoking among older people is especially prevalent, and rates of nicotine dependence and failure to quit smoking are high. The most important factors associated with smoking status were gender, levels of education and religiosity.

The observed high rates of smoking among older people compared to high-income countries raises the need for anti-tobacco campaigns and smoking cessation interventions targeting older people, especially males and those with lower levels of education, backed up by the religious rulings on smoking. The high rate of passive smoking is a significant factor that should be studied in depth and lends support to the need for stronger emphasis on anti-smoking laws and smoking cessation strategies in the general population.

Study Limitations

This is a local study within a single district of Egypt and its results cannot be generalized to the whole country. The religious scale employed was not validated for Islamic culture. Some questions related to the smoking index could allow for the possibility of recall bias.

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Consommation de tabac et facteurs associés chez les personnes âgées : étude à base communautaire en Égypte

Résumé

Contexte : Le tabagisme constitue un risque majeur pour la santé et la consommation de tabac est répandue dans toutes les groupes d'âge en Égypte. Chez les personnes âgées, le tabagisme est considéré comme la première cause évitable d'incapacité et de décès. Peu d'études ont traité la question de la consommation de tabac chez les personnes âgées et les facteurs qui y sont associés.

Objectifs : La présente étude avait pour objectif d'estimer la prévalence et le type de consommation du tabac chez les personnes âgées à Mansoura (Égypte).

Méthodes : Une étude transversale descriptive en population a été menée dans le district de Mansoura (dans les zones urbaines et rurales). Celle-ci comprenait 663 personnes âgées de 60 ans et plus. Les données ont été collectées à partir d'entretiens réalisés au domicile des participants au moyen d'un questionnaire couvrant les informations sociodémographiques sur la famille, les antécédents de tabagisme, une échelle de dépendance à la nicotine et un inventaire en matière de religiosité.

Résultats : La prévalence de la consommation de tabac au moment de l'étude parmi les participants était de 25,3 % et celle du tabagisme passif était de 37,1 %, tandis que 6,3 % étaient d'anciens fumeurs. Parmi les fumeurs au moment de l'étude, la dépendance à la nicotine était de 42,3 %, et 23,3 % n'étaient pas parvenus à arrêter de fumer, tandis que 30,3 % en avaient l'intention. L'analyse de régression logistique a montré que le fait d'être de sexe masculin, d'avoir un faible niveau d'éducation et de religiosité et l'habitat en milieu urbain constituaient les facteurs prédictifs indépendants du tabagisme au moment de l'étude.

Conclusion : La prévalence du tabagisme à la fois actif et passif chez les personnes âgées était considérée comme élevée comparativement aux pays à haut revenu. Les facteurs les plus importants associés au statut tabagique étaient le sexe, l'éducation et la religiosité. Il est urgent de mettre en œuvre des campagnes antitabac et des interventions de sevrage tabagique visant spécifiquement les personnes âgées.

تعاطي التبغ والعوامل المصاحبة له في صفوف كبار السن: دراسة مجتمعية في مصر

دعاء عبد الهادي، عبد الهادي الجيلاني

الخلاصة

الخلفية: يمثل التدخين خطراً كبيراً على الصحة، وينتشر تعاطي التبغ بين جميع الفئات العمرية في مصر. ويعد تعاطي التبغ السبب الرئيسي الذي يمكن تفاديه للإعاقة والوفاة بين كبار السن. وتناولت دراسات قليلة تعاطي كبار السن للتبغ والعوامل المصاحبة لذلك.

الأهداف: تهدف هذه الدراسة إلى تقدير معدل انتشار تعاطي التبغ ونوعه بين كبار السن في المنصورة، بمصر.

طرق البحث: أجريت دراسة سكانية وصفية شاملة لعدة قطاعات في مقاطعة المنصورة (في كل من المناطق الحضرية والريفية). وشملت الدراسة ٦٦٣ شخصاً من كبار السن تبلغ أعمارهم ٦٠ عاماً أو أكبر. وجُمعت البيانات من المقابلات التي أجريت في بيوت المشاركين باستخدام استبيان يغطي التفاصيل الاجتماعية والسكانية للأسرة، وتاريخ تدخين التبغ، ومقياس إدمان النيكوتين، وبيان الالتزام الديني.

النتائج: كان معدل انتشار التدخين الفعلي للتبغ في الوقت الحالي بين المشاركين ٣,٢٥٪، وكان معدل انتشار التدخين السلبي ١,٣٧٪، بينما كانت نسبة المدخنين السابقين ٣,٦٪. وبين المدخنين الفعليين الحاليين، كان معدل إدمان النيكوتين ٣,٤٢٪، وكان معدل الذين أخفقوا في الإقلاع عن

التدخين ٣,٢٣٪، بينما أعرب ٣,٣٠٪ عن نيتهم في الإقلاع عن التدخين. وكشف تحليل الانحدار اللوجستي أن مؤشرات التنبؤ المستقلة للتدخين الحالي تتمثل في كون الفرد ذكراً، وانخفاض مستوى التعليم ودرجة التدين لديه، والإقامة بالحضر.

الاستنتاج: يعد معدل انتشار تدخين التبغ الفعلي أو السلبي بين كبار السن معدلاً مرتفعاً مقارنةً بالبلدان ذات الدخل المرتفع. وكانت أهم العوامل المرتبطة بوضع التدخين هي الجنس والتعليم ودرجة التدين. وهناك ضرورة ملحة لحملات مكافحة التدخين وتدخلات الإقلاع عن التدخين الموجهة تحديداً لكبار السن.

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Prevalence of tobacco use among young adults in Palestine

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Abstract

Background: Smoking tobacco is a worldwide public health issue. Over the last few decades, smoking patterns have been changing, reflected by increasing rates among young people and females in particular.

Aims: This study aimed to determine the prevalence and modalities of smoking and to assess the factors, habits and beliefs that might encourage or discourage smoking among young adults in Palestine.

Methods: A cross-sectional study was conducted in the West Bank in 2014 among Palestinians aged 18–25 years old. Subjects were recruited from six Palestinian universities (n=1997). Participants were asked to complete a questionnaire focusing on sociodemographics, knowledge and beliefs towards tobacco smoking, and the reasons that motivate or hinder smokers to quit.

Results: The prevalence of tobacco smoking was found to be 47.7%. Males had higher smoking rates, consumption levels, and initiated smoking at younger ages (74.4% started at ≤18 years old). Smoking cigarettes and waterpipe were the most common forms among both sexes. Smokers were also found to consume higher amounts of caffeinated drinks and fast food, showed lower scores towards anti-smoking beliefs, and reported significantly higher prevalence of smoking-related symptoms and diseases, primarily shortness of breath (20.5%) and cough (16.6%). The majority of smokers reported attempting and willingness to quit smoking. Health and financial costs were the strongest factors encouraging quitting while mood changes and lack of self-control were the most reported discouraging factors. Moreover, smoking among family members and peers increased the odds of smoking.

Conclusions: Increasing rates of smoking among young Palestinians and a growing popularity of waterpipe use should alert stakeholders to the necessity for the implementation of smoking prevention and awareness policies and programmes.

Keywords: tobacco, smoking, waterpipe, public health, substance use

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Introduction

Tobacco use is one of the major public health concerns worldwide. Annually, more than 7 million people die (12% of all deaths) as a result of tobacco use. Despite all the efforts to control the spread of tobacco use, it continues to adversely influence global health patterns, especially in low- and middle-income countries, where 80% of tobacco users live (*1,2*). Interventions to control tobacco smoking require an understanding of the knowledge and beliefs of the targeted population and tobacco control legislation (*3,4*).

The patterns and modalities of tobacco use have undergone several changes over the past few decades. Smoking rates are globally higher among males, but studies have shown that the gap has been narrowing with increasing tobacco use among females. In addition, the prevalence of smoking has been growing rapidly in the age group 15–24 years (*2*). Furthermore, waterpipe use is an emerging trend that until recently was associated with adults in the Eastern Mediterranean Region (*5,6*). Since the 1990s, waterpipe use has been spreading to younger populations (*7–10*).

Studies have reported varying smoking rates in Palestine and rates have differed depending on the methodology and the target population. The prevalence of smoking ranged between 19.6–26.3% in the general population (*11,12*), and between 35–56% among university students (*13,14*). Few studies have focused on tobacco smoking among Palestinians in the context of beliefs and knowledge (*11,14*). These studies recruited mainly college or school students, but none of them addressed the factors and beliefs towards tobacco use outside of these demographics. Thus, the current study aimed to characterize the prevalence of tobacco smoking and smoking modalities (cigarette and waterpipe smoking) among young Palestinian males and females and to examine the factors and beliefs that might encourage or discourage smoking. This study's results could be utilized to draw strategic plans and policies to reduce tobacco use.

Methods

A cross-sectional study was conducted in the West Bank, Palestine, between January and May 2014. Study subjects were young Palestinians aged 18–25 years. The study included students recruited from six Palestinian universities and non-students of the same age group recruited from university campuses (total=1997). Students were

recruited from 11 different faculties that included both medical and non-medical specialties. Non-students were chosen from the university campuses to minimize the confounding effect of occupational and environmental factors. This group included young administrative staff, cleaners, teaching assistants and other service providers on the university campuses.

Using a convenience sampling approach, subjects received a self-administered questionnaire. The purpose of the survey was explained to the participants verbally along with distribution of an explanatory sheet. Subjects completed the questionnaire anonymously.

The questionnaire was developed in English by intensively reviewing the literature, translated into Arabic, and validated by forward and backward translation. The questionnaire consisted of nine parts including socio-demographic characteristics including sex, age, study major (for students), marital status, parental educational level, place of residence, type of locality (urban or city, rural or village, refugee camp), and family income (very low: <LE 1500; low: LE 1500-<3000; moderate: LE 3000–<6000; above average: LE 6000–10 000; and high:> LE 10 000).

Smoking modalities included the following: type of tobacco consumed, consumption level of cigarettes and waterpipe, age at smoking initiation, attempting to stop smoking, longest period without smoking, dietary habits, self-reported morbidities, knowledge towards harmful effects of smoking, attitude and beliefs towards smoking, willingness of smokers to quit smoking and the reasons for their willingness or fear to quit smoking, factors that might be associated with smoking behaviour, and smoking among family and friends.

The beliefs part was taken from a previously validated questionnaire (The Smoking Consequences Questionnaire for Adults "SCQ-A") (*15*), which is a 30-item self-reported scale that measures the expected utility of cigarette smoking. A 5-point Likert scale ranging from 0 (do not agree) to 4 (strongly agree) was used to assess their agreement to each statement. Nine subscales were derived via principal components analysis: negative affect reduction, social facilitation, taste-sensorimotor manipulation, negative physical feelings, weight control, health risk, stimulation-state enhancement, negative social impression, and boredom reduction. The smokers' group included current tobacco smokers and those who smoked regularly in the past six months. Experimental smokers and ex-smokers (quit smoking for at least the previous six months) were excluded from the study in order to minimize their confounding effect.

Data were coded and entered into IBM SPSS version 23.0 for analysis. For categorical data, frequencies and percentages were used for descriptive analysis, and Pearson Chi-square (χ^2) was used to assess the significance of the differences between proportions. For the belief scores, averages were calculated for each subscale and Mann-Whitney U test was used to evaluate the statistical significance of differences between smokers and non-smokers. Finally, binary logistic regression was used to calculate the odds ratios (ORs) and 95% confidence intervals (CIs) for the associations. Possible confounders were identified through the related literature. The final model was adjusted for sex, age, and family income.

Ethical considerations

The study was approved by the Institutional Review Board (IRB) of Al-Quds University, Palestine. Each subject provided written informed consent before recruitment.

Results

A total of 1997 subjects participated in this study. The majority were males and aged 18–22 years. The study population consisted mainly of university students, of which 33.3% were medical students. Approximately 50% of the participants reported being current smokers. Among males, the prevalence of tobacco smoking was higher compared to females by a factor of 2.5. After adjusting for possible confounding variables (sex, age, and family income), we found that males were five-times more likely to smoke (CI: 4.3–6.5) (Table 1).

The prevalence of tobacco smoking increased with age. University students reported relatively similar rates of smoking compared to non-students of the same age group, but medical students had a lower prevalence compared to non-medical students. Moreover, income level showed a positive relationship with the prevalence of smoking while paternal educational level showed an inverse association. However, maternal educational level, marital status, and place of residence had no significant effect on the prevalence of smoking. As for the type of locality, the lowest prevalence of smoking was found among subjects living in villages and the highest was among those living in refugee camps. Moreover, non-smokers perceived smoking to be costly financially (Table 1).

When examining smoking modalities among young Palestinian adults, the majority of smokers reported smoking both cigarettes and waterpipe. However, although approximately 25% of males and females were exclusively cigarette smokers, a higher proportion of females were exclusively waterpipe smokers (19.7% compared to 4.1% in males). Consumption levels of cigarettes were significantly higher among males while consumption levels of waterpipe did not differ between males and females. Males initiated smoking at an earlier age; 70% before the age of 19 years compared to 58% of females. In addition, more males reported attempting to quit smoking compared to females, but the length of the period spent without smoking did not differ between the two sexes (Table 2).

Dietary habits of smokers and non-smokers were compared among healthy and unhealthy participants (participants who suffer from smoking-related symptoms) (Table 3). It was found that consumption of most types of drinks was higher among unhealthy smokers, especially energy drinks. In addition, no

Table 1 **Characteristics of the study population by smoking status.**

Variable	Category	Smokers (n=953)	Non-smokers (n=1044)	Overall (n=1997)	OR (95% CI)a	*P*-value
		N (%)	N (%)	N (%)		
Sex	Female	173 (23.5)	562 (76.5)	735 (36.8)	1	<0.001
	Male	780 (61.8)	482 (38.2)	1262 (63.2)	5.3 (4.3–6.5)	
Age groups (years)	18–<20	238 (34.2)	457 (65.8)	695 (34.8)	1	<0.001
	20–<22	408 (51.6)	383 (48.4)	791 (39.6)	2.0 (1.7–2.5)	
	22–<24	232 (57.3)	173 (42.7)	405 (20.3)	2.6 (2.0–3.3)	
	24–25	75 (70.8)	31 (29.2)	106 (5.3)	4.6 (3.0–7.3)	
Study group	Student	759 (47.1)	853 (52.9)	1612 (80.8)	1	0.279
	Non-student	192 (50.3)	190 (49.7)	382 (19.2)	1.1 (0.9–1.4)	
Study major	Medical	225 (42.5)	304 (57.5)	529 (33.3)	1	0.006
	Non-medical	528 (49.9)	530 (50.1)	1058 (66.7)	1.3 (1.1–1.7)	
Income	Very low	200 (40.6)	293 (59.4)	493 (26.9)	1	<0.001
	Low	190 (50.7)	185 (49.3)	375 (20.5)	1.5 (1.1–2.0)	
	Moderate	273 (54.2)	231 (45.8)	504 (27.5)	1.7 (1.3–2.2)	
	Above the average	182 (57.1)	137 (42.9)	319 (17.4)	1.9 (1.5–2.6)	
	High	93 (65.5)	49 (34.5)	142 (7.7)	2.8 (1.9–4.1)	
Marital status	Single	833 (46.9)	943 (53.1)	1776 (89.4)	1	0.086
	Married	34 (43.0)	45 (57.0)	79 (4.0)	0.8 (0.5–1.3)	
	Engaged	78 (59.5)	53 (40.5)	131 (6.6)	1.4 (0.9–2.0)	
Paternal educational level	Illiterate	61 (55.5)	49 (44.5)	110 (5.6)	1	<0.001
	Primary	142 (55.3)	115 (44.7)	257 (13.1)	0.9 (0.6–1.5)	
	Secondary	175 (40.7)	255 (59.3)	430 (21.9)	0.5 (0.3–0.8)	
	University level	548 (47.1)	616 (52.9)	1164 (59.4)	0.7 (0.5–1.0)	
Maternal educational level	Illiterate	72 (54.1)	61 (45.9)	133 (6.9)	1	0.303
	Primary	157 (49.4)	161 (50.6)	318 (16.5)	0.8 (0.6–1.2)	
	Secondary	328 (47.5)	363 (52.5)	691 (35.9)	0.7 (0.5–1.1)	
	University level	359 (45.8)	424 (54.2)	783 (40.7)	0.7 (0.5–1.0)	
Place of residence	With the family	729 (46.7)	833 (53.3)	1562 (78.4)	1	0.114
	Housing	220 (51.0)	211 (49.0)	431 (21.6)	1.2 (0.9–1.4)	
Type of locality	Village	458 (43.7)	591 (56.3)	1049 (52.6)	1	<0.001
	City	448 (51.9)	415 (48.1)	863 (43.2)	1.6 (1.3–2.0)	
	Camp	46 (54.8)	38 (45.2)	84 (4.2)	1.5 (1.0–2.5)	
Perceived financial cost	Extremely	595 (63.1)	921 (88.6)	1516 (76.5)	1	<0.001
	Partly	284 (30.1)	103 (9.9)	387 (19.5)	4.3 (3.3–5.5)	
	Not at all	64 (6.8)	15 (1.4)	79 (4.0)	6.6 (3.7–11.7)	

[a]*Odds Ratios were age, sex and family income adjusted*

significant differences in fast food consumption was observed; however, healthy smokers reported a higher consumption of dairy products compared to unhealthy smokers, but the consumption of dairy products in non-smokers was similar in both groups (Table 3).

Examining the mean of the scores obtained on perceived positive and negative beliefs towards smoking, the average scores of smokers who believed that smoking constitutes a health risk (mean=3.57/4) and that smoking gives negative social impressions (2.52/4) were significantly lower than those of non-smokers (3.81/4 and 2.82, respectively). In contrast, smokers held stronger beliefs that tobacco smoking increased confidence in social contexts (2.77/4 compared to 1.95 among non-smokers), helped alleviate boredom (2.83/4 compared to 2.24), reduced stress (3.04/4 compared to 2.27), helped to control weight (2.96/4 compared to 2.77), improved social acceptance (2.53/4 compared to 1.91), and helped increase concentration (3.04/4 compared to 1.95). Furthermore, the risk perception of adverse health outcomes including heart diseases, lung cancer, bronchitis and lung infections, and hypertension was significantly higher among smokers compared to non-smokers (data not shown).

Table 2 Smoking modalities in both genders.

Variable	Category	Females N (%)	Males N (%)	Overall N (%)	P-value
Smoker		173 (23.5)	780 (61.8)	953 (47.7)	<0.001
Smoking modalities	Cigarettes only	40 (23.1)	195 (25.6)	235 (25.1)	0.001
	Waterpipe only	34 (19.7)	31 (4.1)	65 (7.0)	
	Cigarettes & waterpipe	97 (56.1)	536 (70.3)	633 (67.7)	
	Other types alone (cigar, pipe, etc.)	2 (1.2)	0 (0.0)	2 (0.2)	
Cigarette consumption (cigarettes/day)	<10	75 (55.1)	212 (28.5)	287 (32.6)	<0.001
	10–20	35 (25.7)	368 (49.4)	403 (45.7)	
	21–30	8 (5.9)	114 (15.3)	122 (13.8)	
	31–40	9 (6.6)	20 (2.7)	29 (3.3)	
	>40	9 (6.6)	31 (4.2)	40 (4.5)	
Waterpipe consumption (times/week)	Once	39 (34.2)	163 (30.2)	202 (30.9)	0.151
	2–3	31 (27.2)	179 (33.2)	210 (32.2)	
	4–6	26 (22.8)	82 (15.2)	108 (16.5)	
	7–10	11 (9.6)	59 (10.9)	70 (10.7)	
	> 10	7 (6.1)	56 (10.4)	63 (9.6)	
Age at smoking initiation (years)	<12	2 (1.8)	28 (3.9)	30 (3.6)	0.008
	12–14	13 (11.6)	138 (19.4)	151 (18.3)	
	15–18	52 (46.4)	363 (51.1)	415 (50.4)	
	19–22	45 (40.2)	178 (25.0)	223 (27.1)	
	>22	0 (0.0)	4 (0.6)	4 (0.5)	
Attempting to stop smoking	Yes	53 (40.8)	447 (62.0)	500 (58.8)	<0.001
	No	77 (59.2)	274 (38.0)	351 (41.2)	
Longest period without smoking	<1 week	72 (50.7)	360 (49.8)	432 (49.9)	0.165
	1–2 weeks	17 (12.0)	132 (18.3)	149 (17.2)	
	2–4 weeks	24 (16.9)	86 (11.9)	110 (12.7)	
	>1 month	29 (20.4)	145 (20.1)	174 (20.1)	

The factors that mainly influenced smokers to quit were health (80.9%), followed by financial factors (50.4%), and family (46.8), while social factors were the least considered (29.6%). Furthermore, mood changes and loss of self-control were reported among 76.8% and 51.4% of smokers, respectively, as the most discouraging factors for quitting smoking, followed by fear of gaining weight (42.1%) and loss of self-confidence (24.5%). In this study, it was found that a significantly higher proportion of smokers reported their willingness to advise others not to smoke ($P < 0.001$), and the proportion of non-smokers who were made aware through programmes at school about the risks of smoking was significantly higher in comparison to smokers ($P < 0.001$) (data not shown).

Upon examining the health effects of smoking, we found that several symptoms were more prevalent among smokers when compared to non-smokers, including shortness of breath, cough, chest pains, inflammation of the chest, tightness of the chest, heart disease and hypertension ($P < 0.001$) (Table 4).

Regarding the factors that encouraged smoking initiation, it was found that both paternal and maternal tobacco smoking were higher among smokers compared to non-smokers with ORs of 1.8 (CI: 1.5–2.3) and 3.3 (CI: 2.4–4.9), respectively. In addition, more smokers reported having at least a brother who smoked tobacco (OR=1.7; CI: 1.4–2.1) or sister (OR=6.5; CI: 3.9–11.1). Moreover, as the number of friends who smoked increased, the smoking prevalence also expanded, with an OR of 8.7 (CI: 6.7–11.3) for those who have more than 10 friends who smoked tobacco.

When comparing high school leaving certificate grade averages between smokers and non-smokers, it was found that a higher proportion of non-smokers reported grades of 90% or more while most smokers reported an average ranging 70–90%. The OR indicated an increased prevalence of smoking as the grade decreased. The prevalence of smoking was two times higher among students with a university cumulative average less than 70% compared to those with 90% or more (OR=1.9; CI: 1.1–3.5) (Table 5).

Table 3 Dietary habits by smoking status in both healthy and those who suffer from smoking-related symptoms.

Variable	Category	Suffer from smoking-related symptoms			Healthy		
		Smokers	Non-smokers	*P*-value	Smokers	Non-smokers	*P*-value
		N (%)	N (%)		N (%)	N (%)	
Cold drinks	< Once a month	78 (25.4)	55 (33.3)	<0.001	111 (17.2)	185 (21.4)	<0.001
	< Once a week	73 (23.8)	58 (35.2)		241 (37.4)	382 (44.2)	
	2–6 times a week	112 (36.5)	42 (25.5)		157 (24.4)	180 (20.8)	
	Daily	44 (14.3)	10 (6.1)		135 (21.0)	117 (13.5)	
	Total	307 (100)	165 (100)		644 (100)	864 (100)	
Coffee	< Once a month	42 (13.7)	64 (37.9)	<0.001	89 (13.9)	374 (43.6)	<0.001
	< Once a week	53 (17.3)	62 (36.7)		101 (15.8)	224 (26.1)	
	2–6 times a week	79 (25.7)	20 (11.8)		168 (26.2)	103 (12.0)	
	Daily	133 (43.3)	23 (13.6)		283 (44.1)	156 (18.2)	
	Total	307 (100)	169 (100)		641 (100)	857 (100)	
Tea	< Once a month	46 (15.1)	37 (22.2)	0.026	95 (14.9)	127 (14.6)	0.026
	< Once a week	68 (22.3)	49 (29.3)		154 (24.1)	258 (29.7)	
	2–6 times a week	94 (30.8)	37 (22.2)		149 (23.4)	214 (24.7)	
	Daily	97 (31.8)	44 (26.3)		240 (37.6)	269 (31.0)	
	Total	305 (100)	167 (100)		638 (100)	868 (100)	
Energy drinks	< Once a month	76 (24.8)	86 (52.1)	<0.001	211 (33.0)	567 (66.5)	<0.001
	< Once a week	72 (23.5)	38 (23.0)		178 (27.8)	161 (18.9)	
	2–6 times a week	98 (31.9)	32 (19.4)		117 (18.3)	59 (6.9)	
	Daily	61 (19.9)	9 (5.5)		134 (20.9)	65 (7.6)	
	Total	307 (100)	165 (100)		640 (100)	852 (100)	
Dairy products	< Once a month	163 (54.0)	75 (44.9)	0.09	332 (51.7)	342 (39.6)	<0.001
	< Once a week	75 (24.8)	40 (24.0)		151 (23.5)	251 (29.1)	
	2–6 times a week	32 (10.6)	23 (13.8)		88 (13.7)	156 (18.1)	
	Daily	32 (10.6)	29 (17.4)		71 (11.1)	114 (13.2)	
	Total	302 (100)	167 (100)		642 (100)	863 (100)	
Fast food	< Once a month	60 (19.7)	41 (24.3)	0.54	120 (18.9)	188 (21.7)	<0.001
	< Once a week	55 (18.0)	34 (20.1)		131 (20.6)	296 (34.2)	
	2–6 times a week	85 (27.9)	43 (25.4)		200 (31.4)	251 (29.0)	
	Daily	105 (34.4)	51 (30.2)		185 (29.1)	130 (15.0)	
	Total	305 (100)	169 (100)		636 (100)	865 (100)	

Discussion

The prevalence of smoking among sample participants appeared to be high (47.7%), pointing to a continuously growing problem in need of urgent intervention. These results showed significant rates of tobacco smoking among males and females, with increasing popularity for waterpipe smoking, especially among females. The study showed a smoking prevalence higher than that reported among young Palestinians in general aged 15–29 years old (22%) (*16,17*), among An-Najah Palestinian University students in the West Bank (34.7%) (*14*), and Jordanian university students (28.6%) (*18*), but lower than the prevalence of smoking among university students in Gaza (55.7%) (*13*). Furthermore, Khattab et al. found the rates of smoking among Palestinians to be high compared to neighbouring Middle Eastern countries (*19*).

The prevalence of smoking is evidently lower among females globally (*20*), which could be attributed to cultural and social factors (*5*), but could also be an underestimation as a result of under-reporting due to social conditioning (*5,14,18*). Several studies reported a higher prevalence of smoking among Palestinian males but with varying estimates (*12,14,16,17*). In this study, 23.5% of females were found to be tobacco smokers compared to 61.8% of males. Studies have reported higher rates of smoking among young females (university students, young adults and school-aged students) compared to the general population (*11–14,16,17*). The increase in the prevalence of tobacco smoking among females has been attributed to the influence of urbanization on social life in the Region, in addition to the role of the media and marketing strategies that target women (*19*).

Table 4 Prevalence of smoking-related symptoms and diseases by smoking status.

Symptom / Disease	Frequency	Smokers N (%)	Non-smokers N (%)	*P*-value
Shortness of breath	I feel it so much	191 (20.5)	89 (8.7)	<0.001
	Sometimes I feel it	327 (35.0)	295 (28.8)	
	I don't feel it	415 (44.5)	639 (62.5)	
Cough	I feel it so much	155 (16.6)	55 (5.3)	<0.001
	Sometimes I feel it	380 (40.6)	320 (31.0)	
	I don't feel it	401 (42.8)	656 (63.6)	
Chest pain	I feel it so much	131 (14.0)	49 (4.8)	<0.001
	Sometimes I feel it	295 (31.6)	217 (21.0)	
	I don't feel it	508 (54.4)	765 (74.2)	
Frequent inflammations of chest	I feel it so much	84 (9.0)	23 (2.2)	<0.001
	Sometimes I feel it	171 (18.3)	86 (8.4)	
	I don't feel it	678 (72.7)	918 (89.4)	
Squeeze (chest pressure)	I feel it so much	67 (7.2)	31 (3.0)	<0.001
	Sometimes I feel it	146 (15.7)	83 (8.1)	
	I don't feel it	719 (77.1)	907 (88.8)	
Heart diseases	I feel it so much	63 (6.8)	18 (1.8)	<0.001
	Sometimes I feel it	90 (9.6)	51 (5.0)	
	I don't feel it	780 (83.6)	954 (93.3)	
Hypertension	I feel it so much	72 (7.7)	27 (2.6)	<0.001
	Sometimes I feel it	133 (14.3)	60 (5.8)	
	I don't feel it	725 (78.0)	940 (91.5)	

Differences in smoking modalities by sex showed that smoking waterpipe tobacco, in particular, was significant among males and females. Waterpipe smoking is an old practice in the Middle East but has recently become fashionable and gained popularity in both sexes worldwide, especially among young and affluent socioeconomic groups (*21,22*). This trend appears to be encouraged by the assumption that it is safer than smoking cigarettes, as well as the attraction of flavoured tobacco, and the social nature of the activity. In fact, some studies showed that waterpipe smoking has become more prevalent than tobacco smoking (*5,9*).

The prevalence of waterpipe smoking among Palestinian university students was found to be 24% (*23*) while 61.1% of Jordanian university students reported ever smoking from waterpipe (*24*). Additionally, it was found that males, in general, initiated smoking at younger ages compared to females (mainly between 15–18 years of age). Studies show that most adults initiate smoking during adolescence (*25*). Higher smoking rates were observed among residents of refugee camps and rural areas, as well as with increasing age and income, and lower parental educational level.

Parental socioeconomic level was found in some studies to be related to smoking initiation in young people; for example, in low-income countries adolescents coming from high-income families and residing in rural areas had higher rates of smoking (*26*), with several studies from Palestine and Jordan reported similar findings (*14,18,23,27*). However, Jawad et al. reported that Palestinian refugees had nearly twice the rates of current tobacco smoking compared to non-refugees (*28*).

It was also found that smoking among Palestinian young adults was associated with unhealthy nutritional patterns and increased consumption of caffeinated drinks (*29*), which was consistent with other recent studies (*30,31*). The significant increase in the consumption of caffeinated energy drinks, especially among children and young adults, has raised concerns regarding their effects on health among susceptible populations (*32,33*).

Investigation of factors that could encourage smoking initiation among young Palestinian adults indicated that having friends and family members who used tobacco increased the risk of smoking. However, better academic performance, measured by high school leaving certificate grades and university cumulative averages, was associated with a reduction in the prevalence of smoking. Consistent with this study, personal, behavioural and environmental factors had been shown to influence smoking initiation in young people (*3*). Social peer pressure on smoking initiation had been previously found to predict not only smoking behaviour but also the level of tobacco consumption (*34*), and is consistent with recent studies in the Gaza Strip and the United Arab Emirates where peer pressure had the strongest influence on smoking initiation (*11,35*). Furthermore, the higher academic performance of non-smokers reported in this study could be related to personality traits associated

Table 5 **Factors encouraging smoking initiation.**

Factor	Category	Smokers (*n*=953) N (%)	Non-smokers (*n*=1,044) N (%)	OR[a] (95%CI)	*P*-value
Smoker father	No	417(43.9)	593 (57.4)	1	<0.001
	Yes	532 (56.1)	440 (42.6)	1.8 (1.5–2.3)	
Smoker mother	No	851 (89.9)	949 (92.5)	1	0.039
	Yes	96 (10.1)	77 (7.5)	3.3 (2.4–4.9)	
Smoker brother	No	493 (52.3)	666 (56.6)	1	<0.001
	Yes	450 (47.7)	349 (34.4)	1.7 (1.4–2.1)	
Smoker sister	No	848 (92.1)	966 (97.1)	1	<0.001
	Yes	73 (7.9)	29 (2.9)	6.5 (3.9–11.1)	
Number of smoker friends	< 3	112 (12.0)	373 (48.0)	1	<0.001
	3–6	120 (12.8)	113 (14.5)	3.5 (2.5–4.9)	
	7–10	145 (15.5)	76 (9.8)	6.4 (4.5–9.0)	
	> 10	559 (59.7)	215 (27.7)	8.7 (6.7–11.3)	
High school certificate grade average (%)	>95	91 (11.9)	194 (27.3)	1	<0.001
	90–95	136 (17.8)	167 (23.5)	1.8 (1.3–2.6)	
	80–89	257 (33.6)	192 (27.0)	2.6 (1.8–3.7)	
	70–79	215 (28.1)	100 (14.1)	3.1 (2.1–4.6)	
	< 70	65 (8.5)	57 (8.0)	1.6 (0.9–2.5)	
University cumulative average (%)	≥90	32 (4.2)	55 (7.8)	1	<0.001
	80–89	178 (23.5)	260 (36.8)	1.0 (0.6–1.8)	
	70–79	398 (52.6)	315 (44.6)	1.5 (0.9–2.4)	
	< 70	148 (19.6)	76 (10.8)	1.9 (1.1–3.5)	

[a]*Odds Ratios were age, sex and family income adjusted*

with commitment and aspiration as reported by Tyas and Pederson (*36*). Similar findings had been reported by Tucktuck et al. among Palestinian university students (*23*).

The adverse health effects of smoking are already well known. Those found in this study were consistent with recent research assessing the prevalence of chronic obstructive pulmonary disease (COPD) in 11 Middle Eastern countries. The study reported a higher prevalence of COPD among smokers of both cigarettes and waterpipe with a dose–response relationship (*37*). Regardless of the high rates of smoking-related symptoms, lower belief scores for the perceived health risks of smoking were also found (*38*).

Belief patterns of smokers in this study were similar to those reported in the Gaza Strip (*11*). In addition, the reported effects of smoking on perceived reduction of stress and negative emotions were consistent with other studies (*36,39*). Overall, the findings in this study showed that smokers were less knowledgeable of the harmful effects of smoking compared to non-smokers.

Limitations

This study consisted of a large sample recruited to represent different geographic and socio-economic classes. However, the study lacked randomization in the process of selection, thereby limiting the generalizability of the findings. In addition, the sample consisted mainly of students, although the analysis showed no significant difference in the patterns, factors and beliefs towards smoking between students and non-students.

Conclusion

In summary, the prevalence of tobacco use among young Palestinian adults is significant, with waterpipe and tobacco smoking rising. These findings highlight the need for gender and age appropriate tobacco cessation programmes and educational campaigns targeting the health risks of tobacco use. In addition, counseling should be extended to parents who use tobacco in order to support smoking cessation programmes aimed at young people. Adapted interventions should also be accompanied by cognitive-behavioural and motivational strategies that take into account social influences with regard to smoking initiation. Moreover, targeting school-aged students through awareness and peer-led interventions could be effective in reducing long-term smoking rates in young adults and encouraging smoking cessation.

Importantly, for an effective and sustainable tobacco-control programme, a comprehensive nation-wide policy that decreases accessibility to tobacco products among young adults should be adopted. This control could be achieved through prohibiting the purchase of tobacco products by minors, increased taxation and prices, restricting advertising campaigns, and banning smoking in public places.

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Prévalence du tabagisme chez les jeunes adultes en Palestine

Résumé

Contexte : Le tabagisme est problème de santé publique mondial. Ces dernières décennies, les habitudes tabagiques ont évolué, comme le montre l'augmentation des taux de consommation chez les jeunes et chez les femmes en particulier.

Objectifs : La présente étude avait pour objectif de déterminer la prévalence et les modalités de la consommation de tabac et d'évaluer les facteurs, les habitudes et les croyances susceptibles d'encourager cette pratique chez les jeunes adultes en Palestine ou de les en dissuader.

Méthodes : En 2014, une étude transversale a été menée en Cisjordanie auprès de jeunes Palestiniens âgés entre 18 et 25 ans. Les sujets ont été recrutés dans six universités palestiniennes (*n*=1997). Il a été demandé aux participants de compléter un questionnaire portant sur les aspects sociodémographiques, les connaissances et les croyances vis-à-vis de la consommation de tabac ainsi que sur les raisons qui favorisent ou empêchent l'arrêt du tabac.

Résultats : La prévalence du tabagisme était de 47,7 %. Les hommes présentaient des taux et des niveaux de consommation supérieurs aux femmes et commençaient à fumer à un plus jeune âge (74,4 % avaient commencé à un âge inférieur ou égal à 18 ans). Les cigarettes et la pipe à eau constituaient les formes les plus répandues chez les deux sexes. Il a également été observé que les fumeurs consommaient davantage de boissons caféinées et de fast-food. Ils affichaient aussi des scores plus faibles s'agissant des croyances antitabac et faisaient état d'une prévalence significativement plus élevée de symptômes et de maladies liés au tabac, principalement les difficultés respiratoires (20,5 %) et la toux (16,6 %). La majorité des fumeurs ont déclaré avoir essayé d'arrêter de fumer et vouloir y parvenir. Les conséquences sur la santé et le coût financier constituaient les facteurs les plus importants en faveur de l'arrêt du tabac, tandis que les changements d'humeur et le manque de maîtrise de soi étaient les facteurs de démotivation les plus cités. Par ailleurs, le tabagisme parmi les membres de la famille et les collègues augmentait la probabilité de devenir fumeur.

Conclusions : L'augmentation des taux de tabagisme chez les jeunes Palestiniens et la popularité croissante de l'usage de la pipe à eau devraient alerter les parties prenantes et les inciter à mettre en œuvre des politiques et des programmes de prévention et de sensibilisation à cet égard.

معدل انتشار تعاطي التبغ بين الشباب في فلسطين

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الخلاصة

الخلفية: التدخين وباء عالمي. وعلى مدى العقود القليلة الماضية، تغيرت أنماط التدخين بمعدلات متزايدة بين الشباب، وبين الإناث تحديداً.

الأهداف: هدفت هذه الدراسة إلى تحديد معدل انتشار التدخين وكيفياته، وتقييم العوامل والعادات والعقائد التي ربما تشجع الشباب على التدخين أو تثنيهم عنه.

طرق البحث: أجريت دراسة شاملة لعدة قطاعات في الضفة الغربية عام ٢٠١٤ بين الفلسطينيين في عمر ١٨–٢٥ عاماً. وأُتي بالمشاركين في الدراسة من ست جامعات فلسطينية (عددهم ١٩٩٧). وطلب من المشاركين الإجابة عن استبيان يُركّز على الخصائص السكانية الاجتماعية، والمعرفة بالتدخين والمعتقدات الخاصة به، والأسباب التي تدفع المدخنين نحو الإقلاع أو تمنعهم منه.

النتائج: تبيَّن أن معدل انتشار التدخين ٤٧,٧٪. وكانت معدلات التدخين أكبر بين الذكور، وكذلك معدلات الاستهلاك، ويبدأ الذكور في التدخين بأعمار صغيرة (بدأ ٤,٧٤٪ منهم التدخين بعمر ١٨ عاماً أو أقل). وكان تدخين السجائر والنرجيلة أكثر أنواع التدخين شيوعاً بين كلا الجنسين. وأظهرت الدراسة أيضاً أن المدخنين يستهلكون كميات أكبر من المشروبات التي تحتوي على الكافيين ومن الأكلات السريعة، وأبدوا درجات أقل فيما يخص المعتقدات المناهضة للتدخين، وأبلغوا عن معدلات انتشار أكبر من الأعراض والأمراض المصاحبة للتدخين وخاصة ضيق النَّفَس (٢٠,٥٪) والسعال (١٦,٦٪). وأعرب غالبية المدخنين عن محاولتهم الإقلاع عن التدخين ورغبتهم في ذلك. وكانت أكبر العوامل الدافعة للإقلاع عن التدخين هي الحفاظ على الصحة والتكاليف المادية، بينما كانت أكبر العوامل التي تثنيهم عن الإقلاع هي التغييرات في المزاج وانعدام ضبط النفس. وإضافة إلى ذلك، زاد تدخين أفراد الأسرة والأقران من احتمالات التدخين.

الاستنتاجات: ينبغي أن تكون المعدلات المتزايدة للتدخين بين الشباب الفلسطينيين وزيادة شعبية النرجيلة تنبيهاً للأطراف المعنية بشأن ضرورة تطبيق سياسات وبرامج مكافحة التدخين والتوعية بأضراره.

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Oral health and tobacco research in the Eastern Mediterranean Region in relation to the Framework Convention on Tobacco Control: a scoping review

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Abstract

Background: Tobacco use is associated with oral diseases. Evaluating research on tobacco use and oral health can provide insight into the prevailing situation and help engage dental personnel in tackling the tobacco problem.

Aims: This study aimed to map knowledge gaps on tobacco and oral health research in the Eastern Mediterranean Region based on four articles of the Framework Convention on Tobacco Control (FCTC). These were: article 12 – use of communication tools to promote tobacco education and awareness; article 14 – promotion of tobacco cessation; article 20 – exchange of information on determinants and outcomes of tobacco use; and article 22 – international cooperation to transfer expertise to strengthen national tobacco control strategies.

Methods: A scoping review was conducted that included publications on tobacco use and oral health in the Region. PubMed, Scopus, Web of Science, Google Scholar and Proquest theses were searched. Information extracted included: country, study type, whether more than one country was included and whether the publication addressed FCTC articles 12, 14, 20 or 22.

Results: In all, 322 publications were included, of which 82.0% were observational studies and 4.3% were clinical trials. Most publications (87.9%) were from the Islamic Republic of Iran, Jordan, Pakistan Saudi Arabia and Yemen. Only 32 (9.9%) publications included participants from more than one country. Of all the publications, 21.5% related to article 12 of the FCTC, 4.3% to article 14, 94.7% to article 20 and 6.5% article 22.

Conclusions: Research on oral health and tobacco needs to be better aligned with the FCTC articles.

Keywords: tobacco, tobacco use cessation, oral health, dentistry, Eastern Mediterranean Region

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Introduction

Tobacco is associated with many health problems and high mortality rates *(1)*. It is a risk factor for oral diseases including periodontal pockets, alveolar bone loss, tooth mobility, tooth loss and implant failure *(2)*. Studies have shown a higher risk of caries because of lower pH of saliva, reduced salivary buffering capacity, sugar added to tobacco by manufacturers and high number of lactobacilli and *Streptococcus mutans* in the mouths of tobacco users *(3,4)*. Tobacco causes mucosal irritation that may progress to oral precancerous and cancerous lesions. The associated heat from tobacco smoking causes mucosal dryness and higher intraoral temperature with a greater risk of oral infections. Other oral effects of tobacco include bad breath *(5)*, staining of teeth, altered taste and nicotinic stomatitis *(2)*. All forms of tobacco are implicated in such health effects including smoked tobacco, such as cigarettes, cigars, and pipes *(6)*, and smokeless tobacco, such as snuff or chewed tobacco *(7)*.

The World Health Organization (WHO) proposed the Framework Convention on Tobacco Control (FCTC) which is a global public health treaty providing a path for governments to control tobacco. The FCTC came into effect in 2005 and as of 2017, 181 countries are party to the convention *(8)*.

The WHO Eastern Mediterranean Region (EMR) comprises 22 countries. Of the WHO regions, the EMR had the highest increase in the number of tobacco users from 2010 to 2015 *(9)* and this number is expected to further increase by 25% by 2025 *(10,11)*. The increase in tobacco use is attributed to the large proportion of young people who are likely to become users if no action is taken. It is also attributed to the growing use of tobacco in women and use of smokeless tobacco and waterpipes *(12)*. The countries of the Eastern Mediterranean Region, except Palestine and Somalia, are FCTC signatories/parties indicating their political commitment to support the treaty. However, implementation of the FCTC had not progressed in these countries between 2011 and 2015 *(13)* and this is still likely to be the case.

Dental care personnel can play an important role in controlling tobacco use by identifying its intraoral

signs earlier than other health care professionals. Therefore, they are in a position to offer preventive care (e.g. cessation advice) *(14)*. The FCTC includes four articles that can be supported by dental care personnel and assessed by dental research. These are: article 12 on use of communication tools to promote education and awareness of tobacco issues; article 14 on promotion of tobacco cessation; article 20 on exchange of information about determinants and outcomes of tobacco use; and article 22 on international cooperation to transfer scientific expertise to strengthen national tobacco control strategies *(15)*. Thus, the FCTC can guide the design, implementation and evaluation of oral health and tobacco research in the Region to maximize its effect on tobacco control.

Evaluating the type, location and progress of dental research conducted in the Eastern Mediterranean Region on tobacco and oral health can help engage dental care personnel in tobacco control, identify countries where research is needed because of a high prevalence of tobacco use and allow countries of the Region to build on each other's successes to control tobacco use. Evaluating research also provides insight into the prevailing situation to enable capacity-building for dental researchers using regional expertise to tackle the tobacco problem.

A scoping review maps research evidence on a broad topic and identifies research gaps. It follows a rigorous method to identify publications, ensure that they fit prespecified criteria and chart items to develop a research map *(16)*. A scoping review was used here to map dental research on tobacco and oral health according to selected FCTC articles and identify knowledge gaps in the 22 countries of the WHO Eastern Mediterranean Region.

Methods

Study design

A scoping review methodology, as outlined in the Joanna Briggs Institute manual *(17)* and the checklist of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for scoping review (PRISMA-ScR, Appendix 1, available on online), was used *(18)*.

Research question

The research question was based on the four FCTC articles relevant to oral health, which were modified to fit the dental context: article 12 – use of communication tools to promote education and awareness of tobacco issues; article 14 – promotion of tobacco cessation; article 20 – exchange of information about determinants and outcomes of tobacco use; and article 22 – international cooperation to transfer scientific expertise to strengthen national tobacco control strategies *(15)*. The research question was: how has the FCTC affected dental research in each and all countries of the Region? We assessed its influence by evaluating research on (i) the effect of tobacco use on oral health and dental treatment, (ii) the knowledge, attitude and practices of dental care personnel about tobacco, (iii) the knowledge, attitude and practices of the general public about tobacco, (iv) tobacco control interventions in the countries and (v) collaborations in tobacco and oral health research through the recruitment of participants from several EMR countries.

Eligibility criteria

Publications were selected for the study if they included: (i) participants living in at least one country of the Region, (ii) data on tobacco, and (iii) data on oral structures (e.g. tissues and their combinations with prosthetics or restoration), oral conditions, dental care personnel, dental students or dental treatment. Theses available on the Internet were included. There were no language, time, gender or age restrictions. Publications with participants from the Region who were living outside the Region were excluded as were publications by researchers from institutions in the Region that included only participants from outside the Region. Books were excluded.

Information sources

PubMed, Scopus, Web of Science, Google Scholar and Proquest dissertation and theses databases were searched using search terms covering the three concepts of the inclusion criteria (Appendix 2 includes details of the search strategies, available online). The search was conducted from November to December 2018. Mendeley folders were created for each country. Countries were randomly allocated to our team members to search for publications and the results were saved in the relevant folders. Subsequently, all search results were saved to one Mendeley folder and checked to remove duplicates. A level 1 screening was performed (title and abstract) and level 2 screening (full text) of the remaining publications. These two screening steps were checked by another investigator who had not been involved in the screening and differences were resolved by consensus.

Data charting

A data charting form was prepared, which was tested on five publications. Twenty-two columns were added, one for each country, so that countries having collaborated in a publication could be captured. Using the final version of the data charting form, each of us independently charted data from the publications assigned to her and further excluded publications that did not fit the inclusion criteria (level 3 screening). A check was done at the end for all entries by another examiner.

The following data for each publication were extracted; (i): publication year, (ii): whether more than one country (from anywhere in the world) was included (yes/no), (iii) whether more than one country of the Region was included (yes/no), (iv) name of the country of Region included, (v) age of participants (preschool children, 0–5 years; schoolchildren, 6–12 years; adolescents, 13–18 years; young adults, 19–24 year old; adults, 25–44 years; adults, 45–64 years; adults, 65+ years; multiple and unspecified), (vi) study type (letter, case report, case series, cross-sectional, case–control, cohort, clinical trial, systematic review, narrative review, report, in vitro

study and diagnostic accuracy study) (vii) tobacco type (cigarette, cigar, waterpipe, smokeless tobacco, pipe, e-cigarette, multiple and unspecified), (viii) whether the publication addressed the effect of tobacco on oral health or dental treatment (yes/no); (ix) whether the publication addressed the determinants of tobacco use (yes/no); (x) whether the publication addressed tobacco knowledge, attitudes and practices of the general public (yes/no); (xi) whether the publication addressed tobacco knowledge, attitudes and practices of dental care personnel (yes/no); and (xii) whether the publication addressed the effect of dental interventions on tobacco control (yes/no).

Synthesis of results

The number of publications was calculated for the charted items for each country of the Region and overall, and compared these numbers with the prevalence of tobacco use in the country *(19)*. Studies were categorized into observational (cross-sectional, case–control and cohort), clinical trials, reviews/reports (narrative review, systematic review and report) and others (letter, case report, case series, in vitro study and diagnostic accuracy study).

The correlation was assessed between number of publications and the prevalence of tobacco use using the Pearson correlation coefficient.

Results

Figure 1 shows the flowchart of the selection process of publications for the scoping review. A total of 4041 publications were retrieved. After removing duplicates, 2186 remained. After screening the title/abstract and applying the inclusion criteria at different stages, 322 publications were available for inclusion.

Figure 2 shows the trend in publications addressing oral health and tobacco from 1968 to 2018. Before 2000, fewer than five papers a year were published on oral health and tobacco in all 22 EMR countries. From 2000 publications per year increased except for 2011 where it dropped to only five publications. The greatest number of publications was in 2015 (36 publications, average of 1.6 publications per country).

Figure 1 Flow chart of selection of studies included in the scoping review

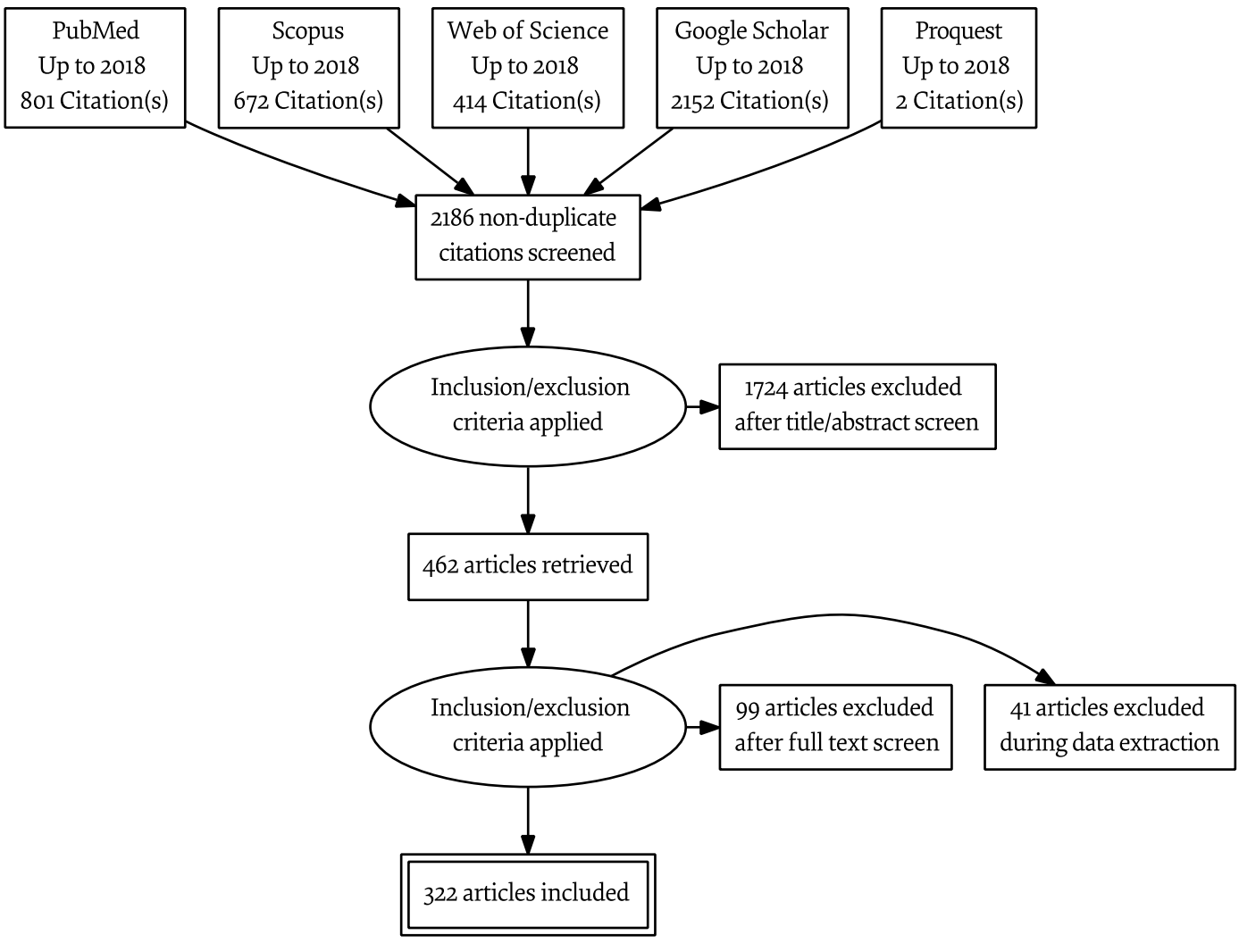


Figure 2 Trend in the number of publications on tobacco use and oral health in the Eastern Mediterranean Region, 1968–2018

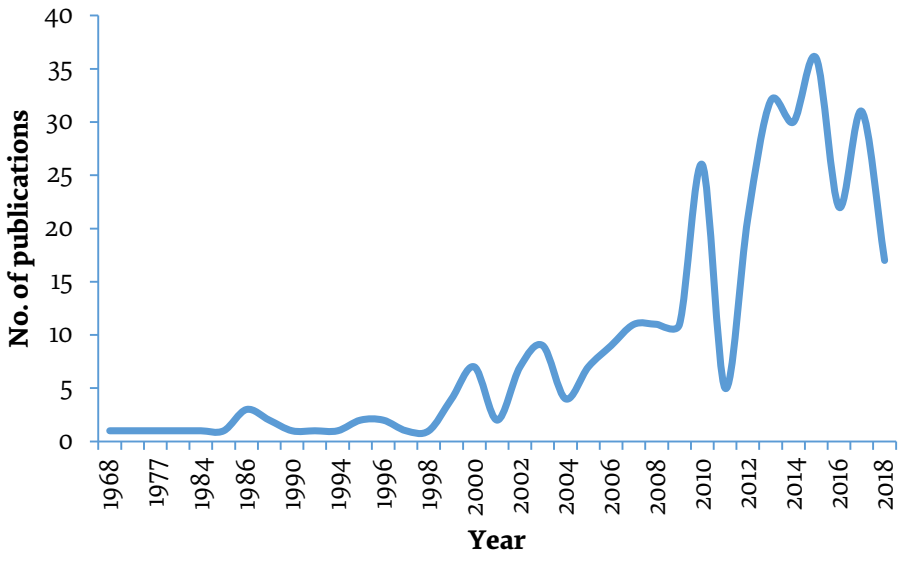


Table 1 Countries by tobacco use prevalence, number of all publications, multi-country publications and study design

Country [a]	Prevalence of tobacco use (19)	Total publications	Publications including > 1 country of the Region	Observational studies	Clinical trials
	%	No.	No. (%)	No. (%)	No. (%)
Saudi Arabia	16	79	12 (15.2)	63 (79.8)	5 (6.3)
Pakistan	19	66	10 (15.2)	46 (69.7)	0
Islamic Republic of Iran	11	60	9 (15.0)	46 (76.7)	3 (5.0)
Yemen	17	40	12 (30.0)	27 (67.5)	1 (2.5)
Jordan	–	38	7 (18.4)	26 (68,4)	3 (7.9)
Sudan	–	28	11 (39.3)	19 (67.9)	0
Egypt	25	19	9 (47.4)	7 (36.8)	2 (10.5)
Iraq	–	16	6 (37.5)	10 (62.5)	0
Morocco	24	14	7 (50)	5 (35.7)	0
United Arab Emirates	29	13	10 (76.9)	4 (30.8)	1 (7.7)
Libya	9	11	7 (63.6)	3 (27.3)	0
Tunisia	33	11	6 (54.5)	4 (36.4)	0
Kuwait	24	9	5 (55.6)	3 (33.3)	0
Lebanon	33	9	7 (77.8)	3 (33.3)	0
Syrian Arab Republic	–	9	8 (88.9)	1 (11.1)	0
Bahrain	27	7	6 (85.7)	1 (14.3)	0
Oman	12	7	6 (85.7)	1 (14.3)	0
Palestine	–	7	6 (85.7)	1 (14.3)	0
Qatar	22	7	5 (71.4)	2 (28.6)	0
Afghanistan	–	6	6 (100)	0	0
Djibouti	13	4	4 (100)	0	0
Somalia	–	4	4 (100)	0	0
All		322	21 (6.5)	264 (82)	14 (4.3)

[a] *In order of the number of publications.*
Dashes (–) mean data were not available.

Table 1 shows the number of publications on oral health and tobacco of each country. The five countries with the most publications were Saudi Arabia (79 publications), Pakistan (66), Islamic Republic of Iran (60), Yemen (40) and Jordan (38) giving a total of 283 publications (87.9% of the 322 publications). Apart from information in four multicountry reviews/reports, no publications were available on Djibouti and Somalia. Lebanon, Tunisia, United Arab Emirates and Bahrain had the highest prevalence of tobacco use (> 25%). The number of publications was negatively correlated with the prevalence of tobacco use but this was not statistically significant (Pearson $r = -0.35$, $P = 0.20$).

Of the 322 publications, 32 (9.9%) included participants from more than one country, 21 (6.5%) included participants from more than one country of the Region (addressing FCTC article 22) and 301 addressed the situation in one country of the Region only. Four (1.2%) reviews/reports covered all 22 countries of the Region. In two other publications, data were collected on three countries of the Region and in 12 publications, data were collected on two countries. Excluding the four multicountry reviews/ reports, Saudi Arabia and Yemen had the most publications that included more than one country of the Region (eight publications each) followed by Sudan (seven), Pakistan and UAE (six each), Egypt and Islamic Republic of Iran (five each) and the Syrian Arab Republic (four).

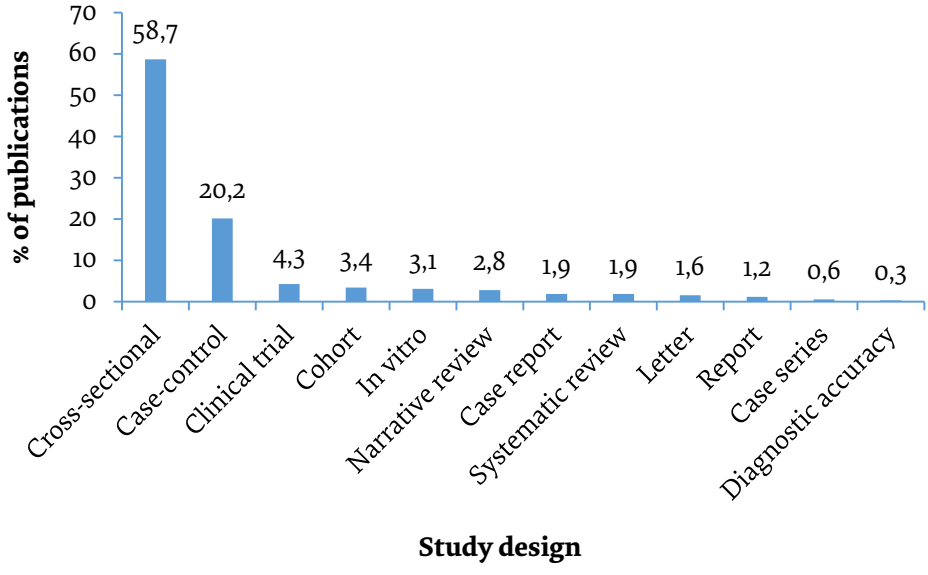
Most publications (82.0%) reported observational studies (Table 1). Figure 3 shows the study designs of the publications: 58.7% were cross-sectional studies, 20.2% were case–control studies and 3.4% were cohort studies. Only 14 (4.3%) publications reported clinical trials (Table 1 and Figure 3). Egypt, Jordan and the United Arab Emirates had the highest percentage of clinical trials relative to their total number of publications (> 7.5%) (Table 1). The 14 clinical trials included participants from Saudi Arabia (five publications), Islamic Republic of Iran (three), Jordan (three), Egypt (two) and United Arab Emirates (one). Most clinical trials were used to investigate interventions to reduce the effect of tobacco on oral health and dental treatment (11 publications); only three of the published clinical trials assessed interventions on tobacco control and interventions to modify the knowledge, attitudes and practices of the general public with regard to tobacco and its effects, harms, use and cessation.

Figure 4 shows that most publications addressed FCTC article 20 (exchange of information on determinants and outcomes of tobacco use), including the effect of tobacco use on oral health and dental treatment (79.5%) and factors affecting tobacco use (15.2%). Fewer publications addressed FCTC article 12 (use of communication tools to promote tobacco education and awareness): knowledge, attitudes and practices in the general public (10.6%) and dental care personnel (10.9%). Only 4.3% of the publications focused on interventions to control tobacco use (FCTC article 14).

Most publications (59.0%) included participants of multiple age groups or unspecified ages (14.9%). Young adults (9.0%) and adults (6.5%) were the two single age groups most frequently studied; only one study (0.3%) focused on preschool children and another study (0.3%) on older people. Seven studies (2.2%) exclusively included adolescents (Appendix 3, available on line).

Most publications addressed multiple (32.3%) or unspecified types of tobacco (28.6%). Smokeless tobacco (21.1%) and cigarettes (13.4%) were the most common types of tobacco examined where only one tobacco product was

Figure 3 Study designs of the publications on tobacco use and oral health in the Eastern Mediterranean Region



included; publications that examined only waterpipe use were less common (3.7%).

Discussion

This study shows that countries of the WHO EMR with the highest prevalence of tobacco use had fewer publications on tobacco use and oral health than other countries of the Region. In addition, most of the publications on tobacco use and oral health were from a small number of countries. Furthermore, few publications addressed tobacco use and oral health in more than one country of the Region. Despite the increase in tobacco and oral health literature in the Region, most publications were aligned with only one FCTC article and few studies directly dealt with tobacco cessation. Most publications were observational studies with only a small number of clinical trials. Few studies addressed young age groups when tobacco use may become established.

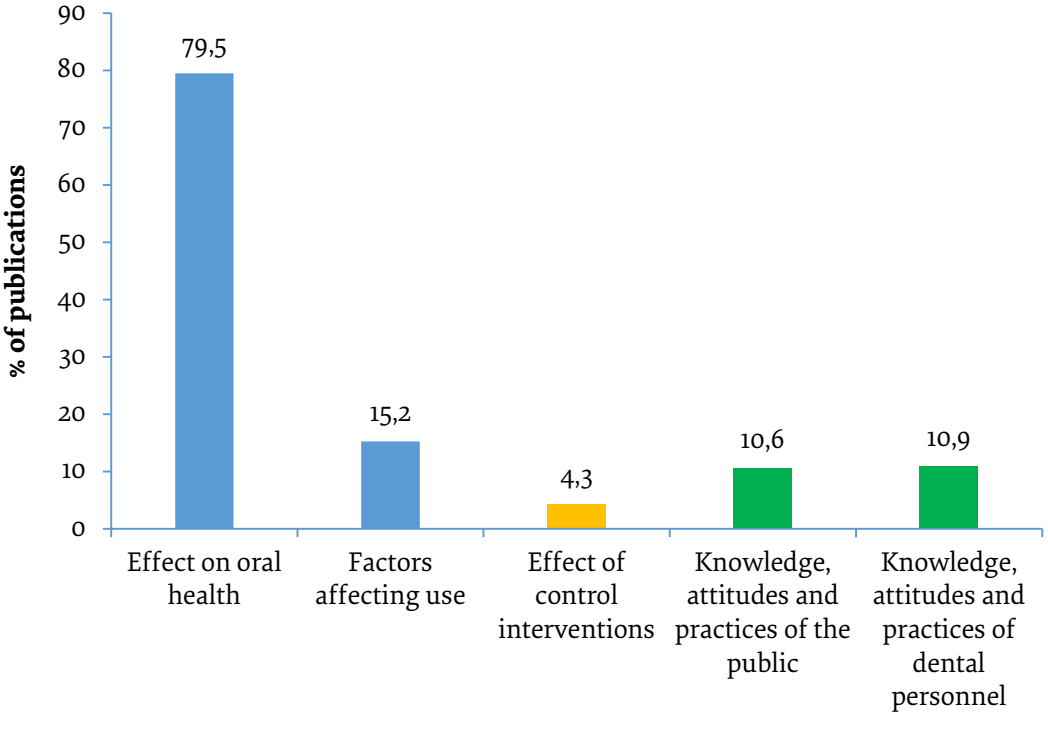
The findings showed an increase in the number publications on tobacco and oral health in the Region over time but overall the number of publications was limited. The increase may reflect a greater global focus on tobacco problems after the FCTC. The decrease in publications in 2011 may be attributed to war and political unrest in Egypt, Libya and Syrian Arab Republic and is an indication of how circumstances may affect research. The findings on an overall small amount of health research in the Region compared to global levels concur with other studies that showed a marked increase in research publications after 2000 *(20)* and an increase after a drop in 2011 *(21)*.

More publications were found with participants from countries within and outside the Region than publications that recruited participants exclusively from several countries of the Region. This finding suggests collaboration between countries of the Region and the world is greater than collaboration within the Region. Other research has also reported greater collaboration in health research between countries of the Region and European and North American countries than between countries of the Region *(20)*. Another study reported that 61% of publications on noncommunicable diseases in the Region were one-country studies and 30% involved regional collaboration *(21)*.

Most of the publications on tobacco and oral health in our review were from Islamic Republic of Iran, Jordan, Pakistan, Saudi Arabia and Yemen. The findings differ from other research that reported that Egypt and Pakistan produced the most health research *(20)*. This difference may be attributed to differences in the research areas and specialties examined. Tobacco and oral health research was also looked at but other countries of the Region may conduct a greater amount of research on the other fields.

Few of the publications in this study reported clinical trials or systematic reviews; of the clinical trials reported, two thirds were from the Islamic Republic of Iran and Saudi Arabia. This partly agrees with a previous study that showed that the greatest increase in clinical trial registration in countries of the Region in the past decade was in the Islamic Republic of Iran *(22)*. Clinical trials and systematic reviews provide the highest level of research evidence to inform clinical decision-making and policy setting. The small number in our study suggests that the

Figure 4 Areas of tobacco use and oral health addressed in the publications in the Eastern Mediterranean Region and the FCTC articles they relate to (blue bars – article 20, orange bar – article 14 and green bars – article 12)



availability of robust evidence to inform clinical practice and policy is limited.

The number of publications addressing different articles of the FCTC varied. While a large number of publications related to an FCTC article does not necessarily mean that this article has been successfully implemented, it gives an indication of the focus on FCTC articles in a country in general and in the health research community including the dentistry community. Our study partly agrees with previous research showing global variation in the progress toward implementing the FCTC in its first 10 years. Rapid progress was made in implementing article 12, while progress was slower for articles 14 and 20; the least progress made was in implementing article 22 *(15)*. Another study that assessed progress in implementing article 14 surveyed key stakeholders in 142 countries and showed better implementation in higher-income countries *(23)*. Research suggests that tobacco cessation services by dentists may be as effective as those provided by other health professionals *(24,25)*, and that tobacco control services provided by dentists can be improved with training and have a positive effect on patients who smoke even if they are not paid for this as a patient care service *(26,27)*. Research on tobacco cessation in a dental context in countries of the Region would provide guidance on designing tobacco control interventions to be implemented by dental care personnel.

The limited amount of research on oral health and tobacco control in the Region may be because of challenges in conducting heath research in general *(20)*. These challenges include limited human resources, financial constraints and problems of data availability because of the health system structure (most health care systems in the Region include no or limited surveillance, so risk factors and disease outcomes are not linked in large datasets that enable research. Similarly, patient records are often not complete). Such challenges are made worse by inadequate research strategies in many countries of the Region that limit the ability of research to respond to local health conditions. Another explanation for the small number of publications on oral health and tobacco control in the Region may be the limited interest and training of dental researchers to explore non-dental solutions to tobacco problems, including pharmacological and behavioural therapies.

This review has some limitations. First, most of the grey literature from the countries of the Region was not included, such as theses or papers published in regional journals, because it is generally not retrievable by search engines. This could have resulted in an underestimation of publications on tobacco and oral health and highlights one of the main challenges facing research in the Region. Second, the findings of the studies were not assessed whether they were translated to policies or improvement in clinical practices. This is an area of research that is needed.

Nonetheless, this scoping review is the first to map the status of research on oral health and tobacco in the Region. Gaps were identified in research including the need for multicountry clinical trials assessing the effect of interventions by dentistry personnel to control tobacco, especially in countries of the Region where tobacco use is most prevalent.

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Competing interests: None declared.

Recherche sur le tabagisme et la santé bucco-dentaire dans la Région de la Méditerranée orientale en lien avec la Convention-cadre de l'OMS pour la lutte antitabac : étude exploratoire

Résumé

Contexte : Le tabagisme est un facteur associé aux maladies bucco-dentaires. L'évaluation de la recherche menée sur le tabagisme et la santé bucco-dentaire peut fournir des indications sur la situation en cours et contribuer à impliquer le personnel de santé bucco-dentaire dans la lutte antitabac.

Objectifs : La présente étude avait pour objectif d'identifier les lacunes en matière de connaissances dans la recherche menée sur le tabagisme et la santé bucco-dentaire dans la Région de la Méditerranée orientale. Elle s'appuie sur quatre articles de la Convention-cadre pour la lutte antitabac : l'article 12 concernant l'utilisation des outils de communication disponibles pour promouvoir l'éducation et la sensibilisation du public à la lutte antitabac ; l'article 14 concernant la promotion du sevrage tabagique ; l'article 20 concernant l'échange d'informations sur les déterminants et les conséquences de la consommation de tabac ; et l'article 22 concernant la coopération internationale pour le transfert des compétences permettant de renforcer les stratégies nationales de lutte antitabac.

Méthodes : L'étude exploratoire réalisée s'est penchée notamment sur les publications relative au tabagisme et à la santé bucco-dentaire dans la Région. Les thèses publiées dans PubMed, Scopus, Web of Science, Google Scholar et Proquest ont été passées en revue. Les informations extraites incluaient : le pays, le type d'étude, le nombre de pays étudiés (un ou plusieurs) et la référence éventuelle aux articles 12, 14, 20 ou 22 de ladite Convention-cadre de l'OMS dans chaque publication.

Résultats : En tout, 322 publications ont été incluses, dont 82 % d'études d'observation et 4,3 % d'essais cliniques. La plupart des publications (87,9 %) provenaient d'Arabie saoudite, de la République islamique d'Iran, de Jordanie, du Pakistan et du Yémen. Seules 32 publications (9,9 %) incluaient des participants de plusieurs pays. Parmi toutes les publications, 21,5 % étaient liées à l'article 12 de la Convention-cadre de l'OMS pour la lutte antitabac, 4,3 % à l'article 14, 94,7 % à l'article 20 et 6,5 % à l'article 22.

Conclusions : La recherche sur le tabagisme et la santé bucco-dentaire doit être mieux alignée sur les articles de la Convention-cadre OMS pour la lutte antitabac.

صحة الفم وتعاطي التبغ في إقليم شرق المتوسط فيما يتعلق بالاتفاقية الإطارية بشأن مكافحة التبغ: مراجعة نطاقية

مها الطنطاوي، بسنت اللقاني، نورهان علي، هنا موسى

الخلاصة

الخلفية: يرتبط تعاطي التبغ بأمراض الفم. ويمكن أن يعطي تقييم البحث بشأن تعاطي التبغ وصحة الفم نظرةً ثاقبة على الوضع السائد، ويسمح بإشراك العاملين في مجال طب الأسنان في تناول مشكلة التبغ.

الأهداف: تمثَّلَ الهدف من هذه الدراسة في تحديد الثغرات المعرفية في البحوث بشأن التبغ وصحة الفم في إقليم شرق المتوسط، استناداً إلى أربع مواد من الاتفاقية الإطارية بشأن مكافحة التبغ. وهذه المواد هي: المادة ١٢ – استخدام وسائل الاتصال لتعزيز التثقيف والتوعية بشأن التبغ؛ والمادة ١٤ – التشجيع على الإقلاع عن التبغ؛ والمادة ٢٠ – تبادل المعلومات بشأن محددات تعاطي التبغ وحصائله؛ والمادة ٢٢ – التعاون الدولي بشأن نقل الخبرة لتعزيز الاستراتيجيات الوطنية لمكافحة التبغ.

طرق البحث: أُجريت مراجعة نطاقية تضمنت منشورات بشأن تعاطي التبغ وصحة الفم في الإقليم. وبُحث في برامج PubMed، Scopus، Proquest، Google Scholar، Web of Science. وقد تضمنت البيانات المُستخرجة: البلد، ونوع الدراسة، وهل أُدرِجَ أكثر من بلد، وهل تناوَل المنشور المواد ١٢ أو ١٤ أو ٢٠ أو ٢٢ من الاتفاقية الإطارية بشأن مكافحة التبغ.

النتائج: أُدرِجَ ٣٢٢ منشوراً (٨٢,٠٪ دراسات رصدية، و٤,٣٪ تجارب سريرية). وكانت معظم المنشورات (٨٧,٩٪) من المملكة العربية السعودية، وباكستان، وجمهورية إيران الإسلامية، واليمن، والأردن. وتضمن ٣٢ منشوراً فقط (٩,٩٪) مشاركين من أكثر من بلد واحد. ومن بين جميع المنشورات، كان ٢١,٥٪ منها مرتبطاً بالمادة ١٢ من الاتفاقية الإطارية بشأن مكافحة التبغ، و٤,٣٪ مرتبطاً بالمادة ١٤، و٩٤,٧٪ مرتبطاً بالمادة ٢٠، و٦,٥٪ مرتبطاً بالمادة ٢٢.

الاستنتاجات: من الضروري مواءمة البحوث بشأن صحة الفم والتبغ بصورةٍ أفضل مع مواد الاتفاقية الإطارية بشأن مكافحة التبغ.

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Smoking prevalence in the Eastern Mediterranean Region

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Abstract

Background: Three global reports issued by the World Health Organization (WHO) track and report on trends in the prevalence of tobacco smoking from 2000 to 2025 based on data from national surveys.

Aims: This review aimed to compare regional and country-level projections for current tobacco smoking as presented in the WHO trend reports. These changes were considered in the context of improved monitoring and tobacco control policies.

Methods: Regional and country-level results in the WHO trend reports were considered in terms of the projected percentage point increase of current tobacco smoking between 2000 and 2025. Data on national surveys and policy implementation came from the relevant WHO reports.

Results: In the 2019 trend report, the prevalence of current tobacco smoking among males is projected to decrease by less than 2 percentage points by 2025. Eight countries featured in both the 2015 and 2019 WHO trend reports. Seven of these countries indicated a more encouraging projection (a decline in their projected increase between 2000 and 2025) for current male tobacco smoking in the 2019 report than in the 2015 report. For five out of these seven countries, their monitoring and tobacco control policy implementation improved over the same period.

Conclusion: Countries in the Region should implement additional national surveys to improve the accuracy of prevalence estimates, allow further projections to be performed and motivate policy-makers to make positive policy changes. Solutions to under-reporting biases during surveys should be considered. Governments should use trend projections to guide effective tobacco control policies to reduce tobacco use in the Region.

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Introduction

As one of the leading preventable causes of morbidity and premature mortality in the world, tobacco contributed to 8 million deaths globally in 2017 (1). Approximately 80% of these deaths occur in low and middle-income countries. In 2013, the World Health Assembly endorsed the World Health Organization (WHO) Global Monitoring Framework for non-communicable diseases (NCDs) and an associated voluntary global target of a 30% relative reduction in tobacco use worldwide among those 15 years or older by 2025 (with 2010 levels as baseline) (2).

Updated data on tobacco use are necessary to identify key policy gaps. To overcome this challenge, WHO and the US Centers for Disease Control and Prevention, have developed a number of surveys designed to track tobacco use among youths (13–15 years) and adults, including the Global Youth Tobacco Survey (GYTS), Global Adult Tobacco Survey (GATS) and STEPwise Surveillance of NCD Risk Factors Survey, for implementation at the country-level (3).

WHO has issued three global reports, in 2015, 2018 and 2019 (4–6), which track trends in the prevalence of tobacco smoking from 2000 to 2025 based on data from national surveys (hereafter referred to as the 'trend reports'). These WHO trend reports can be considered companions to the biennial WHO Report on the Global Tobacco Epidemic (7). This provides the opportunity to compare tobacco control policy developments with the prevalence projections presented in the trend reports.

This review compares regional and country-level projections for current tobacco smoking presented in the WHO trend reports. It highlights how the projected prevalence of tobacco smoking in the Eastern Mediterranean Region (EMR) has changed over time and in the context of globally recognized targets for tobacco use reduction. The changing results presented in the three WHO trend reports are considered in the context of the implementation of country-level surveillance systems and the implementation of national tobacco control policies. This provides relevant and detailed insights regarding current and future tobacco smoking in EMR and the likely impact of improved monitoring efforts and policy changes on projected prevalence rates. It also allows specific recommendations to be made, for both future tobacco use surveillance systems and tobacco control policy-making.

Methods

The three WHO trends reports contain globally comparable national estimates for tobacco smoking prevalence for the years 2000–2025. In these reports these estimates are

summarized into global and regional prevalence estimates and projections. For the projection analysis, the reports use data from nationally representative surveys of tobacco use (or tobacco smoking) published since 1990. The full details of the method for producing trend estimates and projections is described in the trend reports themselves (*4–6*). In the 2015 trend report eight countries in the Region had sufficient survey data for the projection to be performed. In the 2018 and 2019 trend reports, 14 countries had sufficient data for the projection to be performed.

This review focuses on tobacco smoking because it is the indicator used in all three trend reports (unlike tobacco use). It is also by far the most common form of tobacco use in the EMR (*6*). The regional projections for overall male and female current tobacco smoking in the three reports are compared primarily in terms of projected percentage point increase between 2000 and 2025. Country-level projections for current tobacco smoking presented in the 2015 and 2019 trend reports are also considered, again in terms of projected percentage point increase between 2000 and 2025. For country-level figures, current male tobacco smoking is the only figure reviewed. Male smokers make up the vast majority of smokers in the region (*6*) and there are possible concerns about the reliability of data for current female smoking (see Limitations). In all cases, the projected percentage point increase for current tobacco smoking between 2000 and 2025 was calculated by subtracting the estimated current tobacco smoking prevalence in 2000 from the projected prevalence in 2025. Country-level results from the 2015 and 2019 trend reports are compared in terms of changes between the reports in the projected percentage point increase for current male tobacco smoking between 2000 and 2025.

Changes between the 2015 and 2019 reports in country-level projected percentage point increases for current male tobacco smoking are compared with national monitoring of tobacco use through a review of the implementation of national surveys in the countries of the Region. Data on national tobacco surveys comes from the WHO Report on the Global Tobacco Epidemic and the trend reports (*4,6,7*). The countries for which there is a decline in the projected percentage point increase for current male tobacco smoking (2000–2025) between the two reports are identified. Such countries can be regarded as having a more encouraging projection in the 2019 report than in the 2015 report.

Changes between the 2015 and 2019 trend reports in country-level projected percentage point increases for current male tobacco smoking are also compared with changes in national tobacco control policy between 2015 and 2019. These positive changes are identified from the WHO Reports on the Global Tobacco Epidemic 2015 and 2019, using progress in the implementation of any WHO "demand-reduction" MPOWER measure as the metric (*7,8*). The "demand-reduction" MPOWER measures are the five policy recommendations included in the WHO MPOWER package shown to reduce the prevalence of tobacco use when implemented (i.e., all of the MPOWER measures except the Monitoring measure) (*7*).

Results

In the latest trend report (*6*), decreases in overall tobacco smoking rates are projected in all WHO regions. The smallest decrease is expected in the EMR, where the overall tobacco smoking prevalence is projected to drop from 18.3% in 2010 to 16.3% in 2025, if current tobacco control efforts continue. This amounts to an 11% relative reduction in overall tobacco smoking prevalence. For males, which make up the vast majority of all tobacco smokers in the Region, the prevalence of current tobacco smoking is projected to decrease by less than 2 percentage points from 33.1% in 2010 to 31.2% in 2025 (Figure 1). Tobacco smoking rates among females in the Region are low and expected to decrease further (Figure 2) (*6*).

Unlike the 2019 trend report, both the 2015 and 2018 trend reports projected an increase in overall tobacco smoking prevalence between 2010 and 2025 (of 5 percentage points in the 2015 report and less than 1 percentage point in the 2019 report) (*4,5*). All three WHO trend reports projected that the EMR is unlikely to achieve a 30% relative reduction in tobacco smoking prevalence by the year 2025 (*4–6*).

For country-level projections of male current tobacco smoking prevalence in the 2015 trend report (Table 1), rates in all but one country were projected to increase in percentage point terms between 2000 and 2025. This ranged from an increment of 9.9 percentage points (Pakistan) to 68.8 percentage points (Bahrain). Only in the Islamic Republic of Iran was the prevalence rate projected to decrease, by 8.2 percentage points.

For country-level projections of current male tobacco smoking prevalence in the 2019 trend report (Table 2), rates in four countries were projected to increase in percentage point terms. All of these increases were of less than 4 percentage points, with the highest increase projected for Oman (3.7 percentage points). Rates in the remaining 10 countries were projected to decrease. These range from a decrease of 2.1 percentage points for Bahrain to a decrease of 27.4 percentage points for Tunisia.

Of the eight countries that were provided with trend projections in both reports (Bahrain, Egypt, Islamic Republic of Iran, Lebanon, Morocco, Oman, Pakistan and Saudi Arabia), all but one country (Islamic Republic of Iran) saw a decline in the projected percentage point increase for current male tobacco smoking between 2000 and 2025 (Table 1 and Table 2). For three out of these seven countries, this decline in the projected increase between 2000 and 2025 was actually sufficient to take the country from a projected increase in current male tobacco smoking prevalence in the 2015 trend report to a projected decrease in the 2019 report. For the remaining four countries, current male tobacco smoking prevalence was still projected to increase in percentage point terms between 2000 and 2025 in the 2019 report, but to a lesser extent than in the 2015 report.

Of the six countries for which the projection was only

Figure 1 Age-standardized fitted and projected smoking prevalence rates for males aged 15 years, by WHO region, 2000–2025

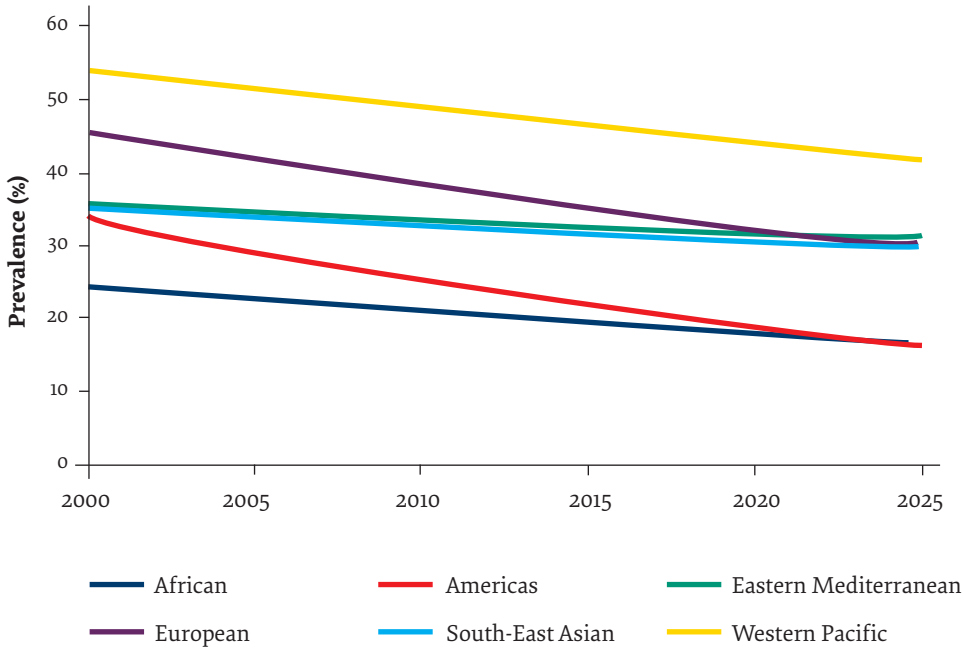

Figure 2 Age-standardized fitted and projected smoking prevalence rates for females aged 15 years, by WHO region, 2000–2025

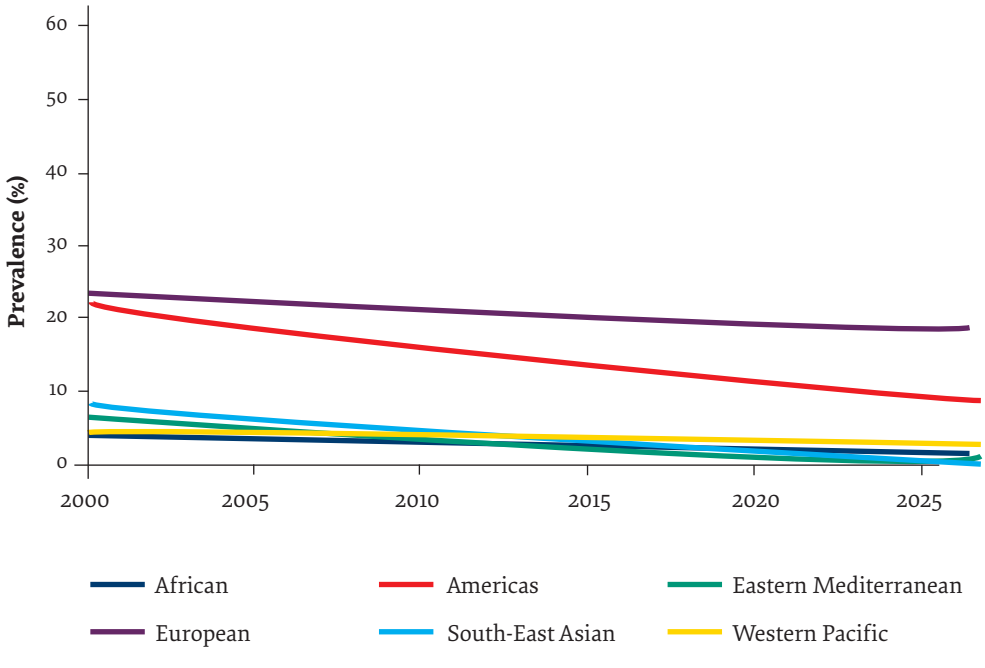

Table 1 Country-level projections for current male tobacco smoking, 2000–2025, WHO Trend Report 2015

Country	Estimated current male tobacco smoking 2000 (%)	Projected current male tobacco smoking 2025 (%)	Absolute percentage point increase*
Bahrain	18.4	87.2	68.8
Egypt	34.2	62.9	28.7
Islamic Republic of Iran	26.7	18.5	-8.2
Lebanon	34.4	57.1	22.7
Morocco	34	57.6	23.6
Oman	12.8	33.3	20.5
Pakistan	35.2	45.1	9.9
Saudi Arabia	21.1	36.1	15

**a negative value amounts to a projected decrease in projected prevalence between 2000 and 2025.*

performed in the 2019 report but not in the 2015 report, all were projected to see a percentage point decrease in current male tobacco smoking between 2000 and 2025.

Over the same period (2015–2019) there has been increased implementation of country-level tobacco use surveys and surveillance systems in several countries in the Region. As noted above, the projection could be performed for six further countries in the 2018 and 2019 trend reports than in the 2015 report (*4–6*). This indicates that many more countries now have more robust data on tobacco use and smoking, of the kind that allows useful trend projections to be calculated.

Of the countries for which the projected percentage point increase for current male tobacco smoking prevalence between 2000 and 2025 declined between the two trend reports (as described above), the number of recent national adult surveys since 2000 used to calculate country specific trends increased for five of them: Egypt (from 5 to 6), Lebanon (from 4 to 5), Morocco (from 4 to 5), Oman (from 2 to 3), and Pakistan (from 3 to 5) (*4,6,7*). The number of such surveys stayed the same for Bahrain and Saudi Arabia.

Of the countries for which the projected percentage point increase between 2000 and 2025 for current male tobacco smoking declined between the 2015 and 2019 trend reports (as described above), five out of seven improved their performance for at least one of the five "demand-reduction" MPOWER measures between 2015 and 2019 (*7,8*). Bahrain and Pakistan improved their performance for one measure each; Egypt and Oman improved their performance for two measures each; and Saudi Arabia improved its performance for four measures.

Discussion

As described above, for seven countries of the Region, the 2019 trend report yields a more encouraging projection to 2025 for current male tobacco smoking as compared to the 2015 trend report. It is reasonable to suppose that this improved outlook is at least in part due to improved monitoring simply providing a more accurate picture of actual current tobacco use. There was only approximately a four year difference in the cut-off points for national tobacco surveys used as datapoints by the 2015 and 2019 trend reports (the years 2014 and 2018 respectively), making it unlikely that actual tobacco use reduction via policy change is solely responsible for these changes.

Nevertheless, considering changes in the country-level projections presented in the 2015 and 2019 trend reports in the context of tobacco control policy implementation is still important. It is likely that for many of the countries having more encouraging projections in the 2019 trend report compared to the 2015 report, their improved tobacco control policies have played a key role (including in Bahrain, Egypt, Oman, Pakistan and Saudi Arabia). In general, many countries have moved forward with MPOWER policy strengthening between 2015 and 2019, including for the Monitoring measure (*7,8*).

Despite this, there are a number of countries that have not achieved any legal policy improvement since the publication of the 2015 trend report and the 2015 edition of the WHO Report on the Global Tobacco Epidemic (*7,8*). This includes some of the countries that have more encouraging projections in the 2019 trend report than in the 2015 report (as noted above, this is likely due to improvements in monitoring). This is in addition to other countries in the Region that have moved backwards with respect to key tobacco control policies since 2015, or implemented moderate policy changes that are substantially less likely to have an effect on reducing prevalence, such as banning tobacco use in some, but not all, public places (*7*).

The above, as well as the fact that all but one of the countries in the Region are not projected to achieve the 30% relative reduction in tobacco use target (*6*), are likely symptoms of the following factors. First, there is not a steady and systematic approach to moving forward with tobacco control across the whole region (*9*) and countries regularly make regressive changes to their tobacco control policies, even while other positive policy changes are being made (*7,10*). Second, in many cases a multi-sectoral approach is missing (*2*). Third, there is often a lack

Table 2 Country-level projections for current male tobacco smoking, 2000–2025, WHO Trend Report 2019

Country	Estimated current male tobacco smoking 2000 (%)	Projected current male tobacco smoking 2025 (%)	Absolute percentage point increase*
Bahrain	36.6	34.5	-2.1
Egypt	40.3	42.6	2.3
Islamic Republic of Iran	25.9	18.3	-7.6
Iraq	38.1	33.5	-4.6
Kuwait	41	36.7	-4.3
Lebanon	40.2	41.4	1.2
Morocco	39	23.4	-15.6
Oman	13.6	17.3	3.7
Pakistan	37.2	27.6	-9.6
Qatar	26.2	23.9	-2.3
Saudi Arabia	23.3	25.4	2.1
Tunisia	64.2	36.8	-27.4
United Arab Emirates	35.7	28.5	-7.2
Yemen	35.5	24	-11.5

**a negative value amounts to a projected decrease in projected prevalence between 2000 and 2025.*

of comprehensiveness in the approach to tobacco control, with policy-makers cherry-picking policies to implement, which is not effective for prevalence reduction (*11*). Fourth, the emergency situation in many countries is affecting progress across the whole region, as recently addressed by a WHO Framework Convention on Tobacco Control (FCTC) Report to the FCTC Conference of Parties (*12*). Individually these countries are unable to move forward in tobacco control and they also make it harder for other countries to continue to improve.

As outlined in the trend results, there were considerable gender differences in tobacco smoking habits in the EMR. Jarallah et al. suggest that this difference is attributable to social stigma attached to smoking among females in countries of the Region (*13*). The standardized survey methods call for family visits to collect responses regarding smoking behaviour. In the presence of male members of the family, females may be reluctant to reveal their true smoking behaviour and are therefore more likely to underreport compared to their male counterparts due to sociocultural factors (*14*).

Smoking prevalence among adolescent females is notably higher in comparison to that of adult females (*15*). This could be a result of less underreporting among this younger population due to increased openness regarding smoking (*14*). It could also reflect some bias related to exclusion of non-school-going adolescent females from the school-based surveys. Another factor may be the relative anonymity of the data collecting process of the adolescent population. Unlike adolescents, respondents to adult surveys, where data are typically collected in the home, may feel anonymity is less assured. Smoking rates among young people can reach 42% among males and 31% among females in the Region (*15*). This also applies to waterpipe smoking, which is in fact more popular among young people than cigarettes (*15*).

Extrinsic factors such as religious beliefs might also play a crucial role in influencing smoking behaviour in the Region. The effect of such factors on tobacco use behaviour is, however, not sufficiently studied (*16*).

Limitations

Of all WHO regions, the EMR has the lowest level of coverage for national surveys monitoring smoking. Since 2013, only 15 out of 22 countries have completed a nationally representative survey of adults that measures some form of tobacco use, and made these results public (*6*). Three countries (Afghanistan, Libya and Sudan) have no results in the WHO trend reports because they have done only one survey to date, needing a second survey to calculate a trend. Somalia is among the six countries globally that have produced no nationally representative data on tobacco use among adults (*5*).

Other indicators of tobacco use, such as smokeless tobacco use, waterpipe use and cigarette use by children aged 13–15 years, were not projected in the trend reports. Despite the fact that Parties to the WHO FCTC are required to monitor all forms of tobacco use, some are technically and logistically challenged to implement the recommended surveys. Out of the 181 Parties to the Convention, only 76 countries regularly monitor all types of tobacco use in both adult and young populations, covering only 40% of the world's population (*5*). Data on use of electronic nicotine delivery systems (ENDS), including electronic cigarettes, are just beginning to be collected.

The reliance of all tobacco use surveys on self-reporting of tobacco use is another limitation, especially if various cultural factors make it likely that tobacco use is under-reported. According to Gorber et al., who

compared the prevalence estimates of smoking produced from self-reported data against the prevalence estimates based on measured smoking biomarkers, self-reported smoking often leads to under-reporting, so much so that the true smoking figures can be underestimated by up to 47% (*17*).

Recommendations

Compared to a high (≥ 95%) probability of a decline in smoking prevalence for most countries in the Americas, European, and Western Pacific regions for both males and females, the possibility of an increase in prevalence in the EMR is high, especially among males (*6*). With the hesitant decline of smoking rates in the EMR, and the slow pace of implementation of tobacco control measures in many countries, the EMR is faced with an escalating economic burden attributed to tobacco-related diseases (*18*). This will in turn prevent most countries in the Region from achieving a 30% reduction in tobacco use by 2025 and cripple attempts to progress universal health coverage goals (*19*). Continued monitoring is crucial for informing and sensitizing decision-makers from the Region about this public health epidemic, the socio-economic burdens caused by tobacco use, as well as the growing use among youth and females that has not been anticipated (*18*).

Incomplete data remains one of the greatest challenges, as some countries in the EMR have not conducted a national survey for over a decade. In addition, some surveys do not report sufficient details, such as tobacco use by age. Efforts to monitor tobacco using cost-effective solutions, such as including Tobacco Questions for Surveys within other surveys that countries are already implementing, should be considered (*20*).

Solutions to the problem of under-reporting could involve ensuring respondents have complete privacy during the survey. Another method would be to manually identify individuals that are likely to have misreported, such as females during pregnancy, and ignore or correct their testimony, e.g., by identifying current smoking using cotinine blood tests or exhaled breath CO monitors (*21*). While likely under-reporting continues, governments should take it into consideration in their policy-making.

Data on the nature and scale of the tobacco epidemic should be used to implement targeted and effective policies to reduce the use of tobacco, including the "demand-reduction" MPOWER measures (*7*). It is is clear that all countries in the Region could do more to strengthen and improve implementation of these proven tobacco control policies.

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Prévalence du tabagisme dans la Région de la Méditerranée orientale

Résumé

Contexte : Trois rapports mondiaux publiés par l'Organisation mondiale de la Santé (OMS) rendent compte des tendances en matière de prévalence du tabagisme entre 2000 et 2025 sur la base de données issues d'enquêtes nationales.

Objectifs : La présente analyse visait à comparer les projections au niveau des régions et des pays concernant le tabagisme durant la période d'étude, comme présenté dans les rapports de l'OMS sur les tendances en la matière. Ces modifications sont examinées dans un contexte d'amélioration des politiques de surveillance et de lutte antitabac.

Méthodes : Les résultats au niveau des régions et des pays fournis par les rapports de l'OMS sur les tendances ont été pris en compte en termes d'augmentation prévue d'un point de pourcentage du tabagisme entre 2000 et 2025. Les données sur les enquêtes nationales et l'application des politiques provenaient de rapports pertinents publiés par l'OMS.

Résultats : Selon les projections du rapport 2009 sur les tendances, la prévalence du tabagisme chez les hommes au moment de l'analyse devrait baisser de moins de deux points de pourcentage d'ici 2025. Huit pays de la Région étaient représentés dans les deux rapports sur les tendances de 2015 et 2019. Sept ces huit pays indiquaient une projection plus encourageante (à savoir une diminution de la projection relative à l'augmentation entre 2000 et 2025) pour le tabagisme chez les hommes en 2019, par rapport à 2015. Cinq de ces sept pays ont connu une amélioration de l'application de leurs politiques de surveillance et de lutte antitabac.

Conclusion : Les pays de la Région devraient réaliser des enquêtes nationales supplémentaires pour améliorer la précision des estimations de la prévalence, permettre la réalisation de nouvelles projections et inciter les responsables de l'élaboration des politiques à les faire évoluer positivement. Des solutions devraient être envisagées quant au biais de sous-notification lors des enquêtes. Les gouvernements devraient utiliser les projections de tendances pour orienter l'élaboration de politiques de lutte antitabac efficaces et réduire le tabagisme dans la Région.

معدل انتشار التدخين في إقليم شرق المتوسط

هبة فؤاد، أليسون كومار، رندة حمادة، فاطمة العوا، زي شن، تشارلز فريزر

الخلاصة

الخلفية: ثلاثة تقارير عالمية صادرة عن منظمة الصحة العالمية ترصد اتجاهات معدل انتشار تدخين التبغ وتتتبَّعها من عام ٢٠٠٠ إلى عام ٢٠٢٥ بناءً على بيانات من دراسات استقصائية وطنية.

الأهداف: كان هذا الاستعراض يهدف إلى عقد مقارنة بين التوقعات الإقليمية والقُطرية للمعدل الحالي لتدخين التبغ التي وردت في تقارير المنظمة عن الاتجاهات، ودراسة هذه التغييرات في سياق تحسُّن الرصد وسياسات مكافحة التبغ.

طرق البحث: تُدرَس النتائج الإقليمية والقُطرية الواردة في تقارير المنظمة عن الاتجاهات من حيث الزيادة المئوية المتوقعة في المعدل الحالي لتدخين التبغ بين عامي ٢٠٠٠ و٢٠٢٥. وتُستقى البيانات الخاصة بالدراسات الاستقصائية الوطنية وتنفيذ السياسات من التقارير ذات الصلة الصادرة عن المنظمة.

النتائج: من المتوقع في تقرير الاتجاهات لعام ٢٠١٩ أن ينخفض المعدل الحالي لتدخين التبغ بين الذكور بنسبة تقل عن ٢٪ بحلول عام ٢٠٢٥. وتناول كلا تقريري المنظمة بشأن الاتجاهات لعامي ٢٠١٥ و٢٠١٩ ثمانيةَ بلدان. وفي سبعة من هذه البلدان كانت توقعات المعدل الحالي لتدخين التبغ بين الذكور في تقرير ٢٠١٩ تبعث على الأمل بدرجة أكبر مقارنةً بتقرير ٢٠١٥ (إذ حدث انخفاض في الزيادة المتوقعة بين عامي ٢٠٠٠ و٢٠٢٥). وقد شهدت خمسة من هذه البلدان السبعة تحسناً في كلٍّ من الرصد وتنفيذ سياسة مكافحة التبغ.

الاستنتاج: ينبغي لبلدان الإقليم تنفيذ دراسات استقصائية وطنية إضافية لتحسين دقة التقديرات الخاصة بمعدل الانتشار، والسماح بإجراء مزيد من التوقعات، وتحفيز واضعي السياسات على إجراء تغييرات إيجابية في السياسات. وينبغي النظر في إيجاد حلول للتحيزات التي يوجد تقصير في الإبلاغ عنها خلال الدراسات الاستقصائية. وينبغي للحكومات أن تسترشد بالتوقعات الخاصة بالاتجاهات في وضع سياسات فعالة لمكافحة التبغ من أجل الحد من تعاطي التبغ في الإقليم.

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The status of tobacco control in the Eastern Mediterranean Region: progress in the implementation of the MPOWER measures.

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Abstract

Background: The World Health Organization (WHO) MPOWER measures are a set of highly effective tobacco control measures drawn from the WHO Framework Convention on Tobacco Control (FCTC), designed to help countries reduce the prevalence of tobacco use. The WHO Report on the Global Tobacco Epidemic is published biennially to monitor global implementation of these measures.

Aims: This review aimed to critically assess the status of MPOWER implementation in the Eastern Mediterranean Region.

Methods: Data were collected for WHO Reports on the Global Tobacco Epidemic, focusing on the most recent 2019 edition. Regional population coverage figures were calculated using this data and population figures for the countries of the Region.

Results: Between 2007 and 2018, for any MPOWER measure, there were 29 cases of countries progressing to the highest level of achievement; 23 cases of countries progressing to the intermediate levels from the lowest level; 12 cases of countries falling from the highest level; and 18 cases of countries falling to the lowest level. 57.7% of people are covered at the highest level for the monitoring measure; 63.7% for the smoke-free policies measure; 6.7% for the cessation measure; 60.7% for the health warnings measure; 37.4% for the mass media measure; 29.4% for the advertising bans measure; and 16.1% for the taxation measure.

Conclusions: Countries must work comprehensively to improve tobacco control. Regional priorities should include lifting more people out of lowest level coverage for the health warnings and mass media measures, increasing taxation on tobacco products and improving access to cessation services.

Keywords: tobacco, smoking, tobacco control, noncommunicable diseases, MPOWER

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Introduction

In May 2013 the World Health Assembly of the World Health Organization (WHO) adopted and approved a set of voluntary targets for the control of non-communicable diseases (NCDs). All countries have shown commitments to these targets, which include a 30% relative reduction in tobacco use by the year 2025 (*1*). The importance of this target is further emphasized by the Sustainable Development Goals (SDGs) and, in particular, SDG3a on strengthening the implementation of the WHO Framework Convention on Tobacco Control (FCTC). In 2018, this commitment was reinforced by the introduction of WHO 13th General Programme of Work, which aims for a 25% relative reduction in the prevalence of current tobacco use among persons aged 15 years and above by 2023 (*2*). Member States of the Eastern Mediterranean Region (EMR) have pledged to achieve this target and to work towards scaling up national policy implementation based on the WHO FCTC, the MPOWER package (*3*) and the NCD best buys (*4*).

This review examines the current status of implementation of the MPOWER measures in the countries of the Region and the resulting regional population coverage for these measures. It considers how policies have changed in EMR Member States over time and considers these results in relation to tobacco trend reports published in 2015 and 2018.

Methods

Data for MPOWER achievement at the country level were taken from the relevant published editions of the biennial WHO Report on the Global Tobacco Epidemic (hereafter, the Report). It was first published in 2008 and most recently in 2019. Each Report publishes data from the previous year. For the 2019 Report (*5*), data on the implementation of the MPOWER measures were correct as of 31 December 2018 (with two exceptions: taxation (31 July 2018) and mass-media campaigns (30 June 2018).

Regional population coverage figures were calculated with an exactly similar method to the global coverage figures presented in the 2019 Report (*6*). 2018 population

figures for each country and the Region are from the Population Division of the UN Department of Economic and Social Affairs (Population Prospects 2019) (7). The absolute regional coverage figures for each level for each measure (in Table 1) were calculated by summing the population figures for the countries performing at that level. The percentage coverage was calculated from the absolute coverage and the total population of the region. The percentage changes from 2016 were calculated by doing the same for 2016 data, for which updated data published with the Report 2019 were used. As in the 2019 Report, population figures were kept constant throughout calculations to avoid the effect of population changes in countries.

The regional prevalence data and trend projections included in this paper come from the 1st and 2nd editions of the WHO Global Report on Trends in the Prevalence of Tobacco Smoking (*8,9*). These reports include trend lines for each country that summarize smoking prevalence between 2000 and 2015 and project trends to 2025. This allows regional and global prevalence projections to be calculated (this is done in detail in the 2nd edition of the report). It should be noted that there are substantial gaps in the data used in these reports, especially for the 1st edition. Some countries have not completed a relevant smoking prevalence survey in over a decade.

MPOWER achievement at the country level

The Report contains data on the seven MPOWER measures: Monitor tobacco use and prevention policies (Monitoring); Protect people from tobacco smoke (Smoke-free Policies); Offering cessation services to tobacco users (Cessation); Warning the public about the dangers of tobacco (through health warnings and mass media campaigns) (Health Warnings, Mass Media); Enforce bans on advertising, promotion and sponsorship (Advertising Bans); and, Raise taxes on tobacco products (Taxation). Each measure corresponds to one or more articles of the WHO FCTC. The aim is to provide countries with a set of effective measures to reduce the demand for tobacco products. For each measure there are several possible levels of achievement, as outlined in Table 2. Full details can be found in the 2019 Report (*6*).

Table 3 outlines the number of countries performing at the highest level, the intermediate levels (amounting to two levels) and the lowest level in 2007 and 2018. Overall, between 2007 and 2018, the number of countries performing at the highest level increased for each measure apart from Monitoring (that had less stringent criteria for highest achievement in 2007). Over the same period, the number of countries performing at the lowest level decreased for all measures apart from Monitoring. However, as in 2007, most countries remain at the intermediate level, having partially implemented the MPOWER measures. In 2018, more countries performed at the intermediate levels than at the lowest level or the highest level for each measure.

Between 2007 and 2018 (for Mass Media, 2010 is considered instead of 2007 since this measure was not included in the MPOWER package in the 2008 Report), there were 29 cases of countries moving up to the highest level of achievement for an MPOWER measure (from any lower level), including seven cases of countries moving up to the highest level from the lowest level. There were 23 cases of countries moving up to the intermediate levels from the lowest level.

Over the same period, there were 11 cases of countries dropping to the intermediate levels from the highest level for an MPOWER measure. There were 18 cases of countries dropping to the lowest level (from any higher level), including one case of a country moving to the lowest level from the highest level.

Between 2016 and 2018, 8 out of the 22 countries in the Region moved up to a higher level for at least one of the MPOWER demand reduction measures (i.e., the five POWER measures – all the measures apart from Monitoring) (*10*). On the other hand, even compared to 2016 there have been five cases of countries getting worse with respect to the POWER measures (*10*). Two of these decreases occurred for the Islamic Republic of Iran,

Table 1 Regional population coverage for each MPOWER measure by level of achievement

MPOWER Measures	Highest Level		Intermediate Levels		Lowest Level	
	Absolute coverage (people)	Percentage coverage (%)	Absolute coverage (people)	Percentage coverage (%)	Absolute coverage (people)	Percentage coverage (%)
Monitoring [M]	406 230 474	57.7	259 019 885	36.8	38 631 842	5.5
Smoke-free Policies [P][1]	448 024 939	63.7	168 670 742	24.0	77 555 561	11.0
Cessation [O]	47 471 027	6.7	640 444 025	91.0	15 967 149	2.3
Warnings [W]						
Health Warnings	427 113 751	60.7	118 271 082	16.8	158 497 368	22.5
Mass Media	263 408 886	37.4	204 887 754	29.1	235 585 561	33.5
Advertising Bans [E]	206 930 429	29.4	481 943 546	68.5	15 008 154	2.1
Taxation [R][2]	113 251 895	16.1	406 441 577	57.7	183 229 806	26.0

[1] *The United Arab Emirates is excluded here because its achievement for this measure was not classified in the 2019 Report.*

[2] *Djibouti is excluded here because its achievement for this measure was not classified in the 2019 Report.*

Table 2 Summary of criteria for achievement for each level for each MPOWER measure

M: Monitoring	Highest level	Recent, representative and periodic data for both adults and youth.
	Intermediate levels	High-intermediate: recent and representative data for both adults and youth. Low-intermediate: recent and representative data for either adults and youth.
	Lowest level	No known data or no recent data or data that are not both recent and representative.
P: Protection from second-hand smoke	Highest level	All public places completely smoke-free (or at least 90% of the population covered by complete subnational smoke-free legislation).
	Intermediate levels	High-intermediate: Six to seven types of public place completely smoke-free. Low-intermediate: Three to five types of public place completely smoke-free.
	Lowest level	Complete absence of ban, or up to two types of public place completely smoke-free.
O: Offer cessation support	Highest level	National quit line and both nicotine replacement therapy (NRT) and some cessation services cost-covered.
	Intermediate levels	High-intermediate: NRT and/or some cessation services (at least one of which is cost-covered). Low-intermediate: NRT and/or some cessation series (neither cost-covered).
	Lowest level	None
W: Graphic Health Warnings	Highest level	Large warnings with all appropriate characteristics.
	Intermediate levels	High-intermediate: Medium size warnings with all appropriate characteristics or large warnings missing some appropriate characteristics. Low-intermediate: Medium size missing some or many appropriate characteristics or large warnings missing many appropriate characteristics.
	Lowest level	No warnings or small warnings
W: Mass media campaigns	Highest level	National campaign conducted with at least seven appropriate characteristics including airing on television and/or radio.
	Intermediate levels	High-intermediate: National campaign conducted with five to six appropriate characteristics, or with seven characteristics excluding airing on television and/or radio. Low-intermediate: National campaign conducted with one to four appropriate characteristics.
	Lowest level	No recent national campaign conducted with a duration of at least three weeks.
E: Enforce bans on advertising, promotion and sponsorship	Highest level	Ban on all forms of direct and indirect advertising (or at least 90% of the population covered by subnational legislation completely banning tobacco advertising, promotion and sponsorship).
	Intermediate levels	High-intermediate: Ban on national television, radio and print media as well as on some but not all other forms of direct and/or indirect advertising. Low-intermediate: Ban on national television, radio and print media only.
	Lowest level	Complete absence of ban, or ban that does not cover national television, radio and print media.
R: Raise taxes on tobacco products	Highest level	≥75% of retail price of the most popular brand of cigarettes is tax.
	Intermediate levels	High-intermediate: ≥50% and < 75% of retail price is tax. Low-intermediate: ≥ 25% and <50% of retail price is tax.
	Lowest level	<25% of retail price is tax.

Table 3 Number of countries performing at each level for each MPOWER measure

MPOWER Measures	Highest level		Intermediate levels		Lowest levels	
	2007	2018	2007	2018	2007	2018
M	10	6	9	13	3	3
P	1	7	13	8	8	7
O	0	3	17	17	5	2
W GHW	0	5	14	10	8	7
W MM	3*	4	8*	8	11*	10
E	8	10	11	11	3	1
R	0	3	11	12	11	7

**Achievement for the mass media warnings measure is from 2010 instead of 2007.*

which dropped to the lowest level for Taxation and from the highest level for Cessation.

In terms of compliance with legislation, of the countries given a compliance score for the 'Smoke-free Policies' in the 2019 Report (*6*), 10 countries, including 6 out of the 7 countries performing at the highest level (Afghanistan, Egypt, Lebanon, Libya, Pakistan and the West Bank and Gaza Strip), were given a score of 3/10 or lower (*10*). Only two countries were given a score of 8/10 or higher (labelled 'high compliance') for this measure. Of the countries given a compliance score for the advertising bans measure, 10 countries were given a score of 8/10 or higher and 9 were given a score between 3/10 and 7/10 (labelled 'moderate compliance').

Regional population coverage

Implementation of the MPOWER measures at the country level translates into degrees of coverage of the regional population. For each MPOWER measure, Table 1 presents the population coverage at the highest level, the intermediate levels and the lowest level. Three measures (Monitoring, Smoke-free Policies and Health Warnings) are each adopted at the highest level for over half of the total population of the Region. For both Smoke-free Policies and Health Warnings, over 60% of people are covered at the highest level.

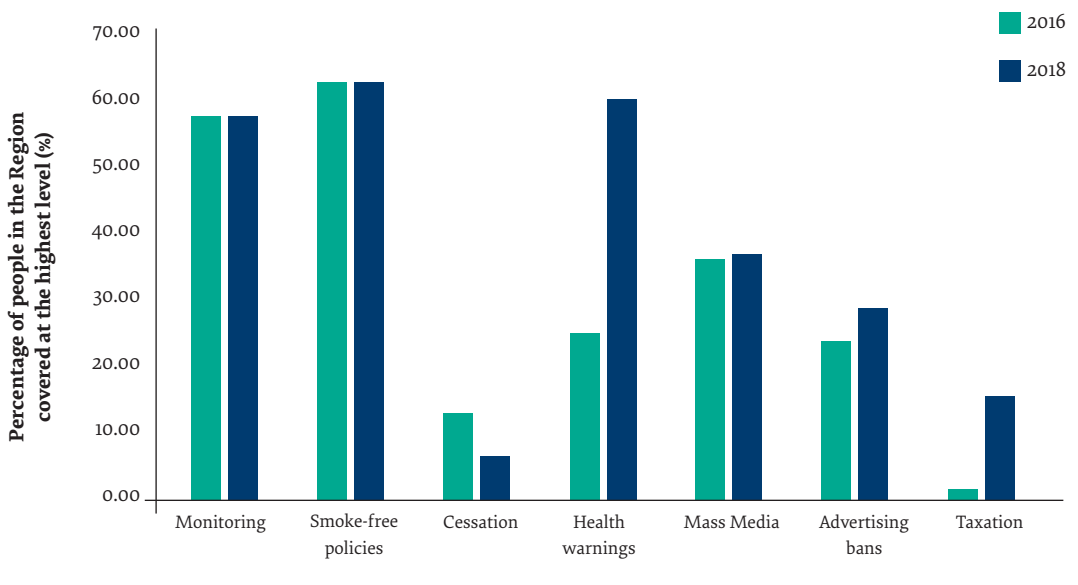
However, large proportions of the population of the Region are not covered by the warnings measure (beyond the lowest level), with over 30% of people in the Region are not covered by anti-tobacco mass media campaigns in their country. Despite a relatively high proportion of people being covered at the highest level by health warnings on cigarette packs, over 22% of people still live in countries where such warnings are either absent or very small. Similarly, for Taxation, over a quarter of people are not covered (beyond the lowest level), while 16% of people are covered at the highest level for this measure.

Figure 1 shows that highest level coverage for the MPOWER measures has improved for 4 out of the 7 measures since 2016, including some large percentage increases. Most notably the number of people covered at the highest level by health warnings on cigarette packs increased by over 135% between 2016 (25.7%) and 2018 (60.7%). The number of people covered at the highest level by the taxation measure increased by 677% from very low coverage (2.1%) in 2016 to higher coverage (16.1%) in 2018.

There was a large percentage decrease in the number of people covered at the highest level for Cessation. In 2018, just over 50% fewer people had access to the comprehensive tobacco dependence treatment afforded by adoption of this measure at the highest level. The proportion of the population covered at the highest level for Monitoring dropped slightly, from 58.4% in 2016 to 57.7% in 2018.

Several of the changes in population coverage from 2016 to 2018 can be attributed to particular countries with large populations adopting legislation in line with one or more of the MPOWER measures. For instance, the large increase in the percentage of people covered at the highest level by graphic health warnings on cigarette packs was due to Pakistan, with a population of over 212 million, and Saudi Arabia, with a population of close to 34 million, adopting legislation to reach the highest level for this measure. The even larger percentage increase in the number of people covered by adequate taxation policy is due to Egypt implementing a tax increase on cigarette packs, taking it above 75% of retail price as tax threshold. The 50% fall in the number of people in the Region covered by comprehensive cessation services is in part

Figure 1 MPOWER coverage at the highest level: 2016, 2018



due to the Islamic Republic of Iran reducing the cessation services it provides, and thus no longer performing at the highest level for this measure.

In comparing regional and global coverage at the highest level (*11*), a far higher proportion of the Region's population is protected by comprehensive smoke-free policies (63.6%) than the estimated proportion of the global population covered by such policies (22%). Regional coverage at the highest level is also significantly higher than global coverage at that level for Health Warnings (regional: 60.7%; global: 52%), Mass Media (regional: 37.4%; global: 24%), Advertising Bans (regional: 29.4%; global: 18%) and Monitoring (regional: 57.7%; global: 38%).

Coverage at the highest level at the regional level is significantly lower than at the global level for Cessation (regional: 6.7%; global: 32%). In addition, lack of coverage (beyond the lowest level) is much higher in the Region than globally for Mass Media (regional: 33.5%; global: around 19%) (*12*).

The tobacco prevalence trend in the Eastern Mediterranean Region

WHO issued reports on trends in the prevalence of tobacco smoking in 2015 (*8*) and in 2018 (*9*) (a third report was issued in December 2019). Both reports projected that the EMR will not achieve its 30% relative prevalence reduction target (12.6%) by the year 2025. In fact, the prevalence of tobacco use in the EMR was projected to increase in both reports. Despite this, there is a notable difference in the projections. The 2015 report projected a prevalence increase of 5 percentage points from 2010 to 2025, while in the 2018 report the projected increase was of less than 1 percentage point (Figure 2). This is due to some large decreases in the projected 2025 prevalence for several countries (Bahrain, Lebanon, Oman, Pakistan and Saudi Arabia) between the two reports (*8,9*). With respect to the change in the regional prevalence projection between the two trend reports, the most important decrease was for Pakistan (whose population amounts to just over 30% of the Region), where the projected 2025 male prevalence dropped from 45.1% in the 2015 report to 35.1% in the 2018 report.

Discussion

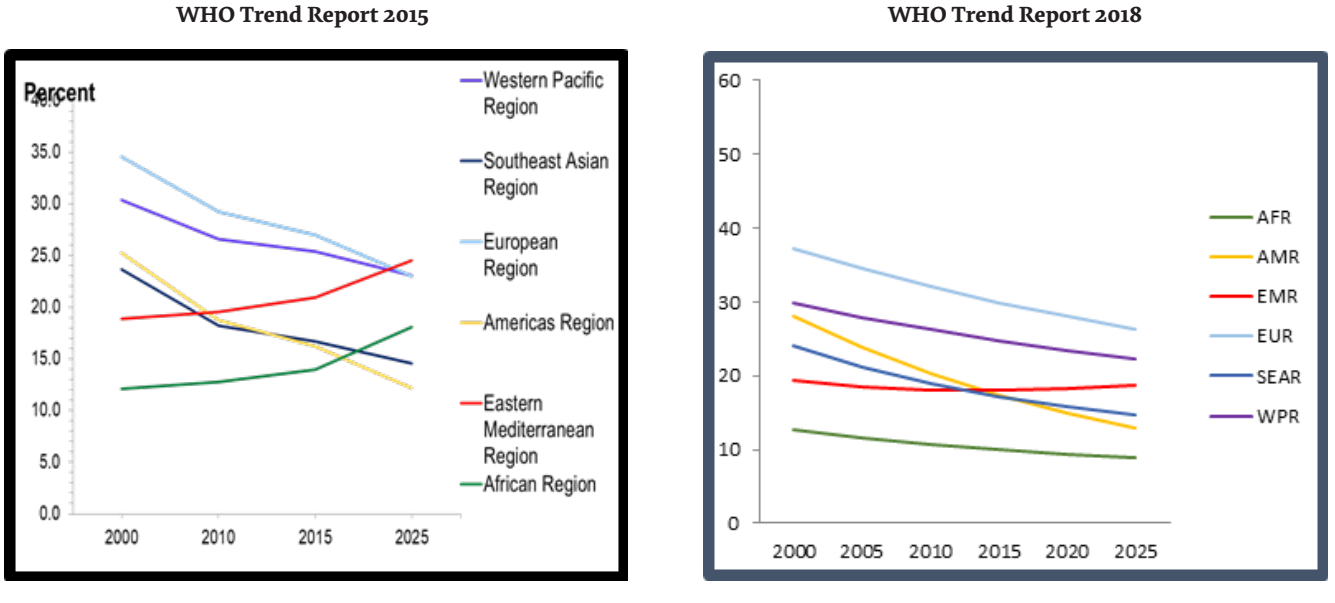
The difference between the 2015 and 2018 trend reports indicates improvement in tobacco control efforts in the Region. This accords with the figures for both policy developments at the country level and population coverage at the regional level. For both we see widespread improvement, as outlined in the analysis above.

However, the change in projected prevalence should not only be attributed to improvements in tobacco control policy. Tobacco and other NCD risk-factor surveillance has also drastically improved, with the implementation of several Global Adult Tobacco Survey, Global Youth Tobacco Survey and Stepwise Surveillance of NCD Risk Factor programmes in various countries. When the 2015 trend report was issued only 8 countries in the Region had sufficient data on smoking prevalence for adults to calculate their projected prevalence up to 2025 (*8*). By 2018, 14 countries of the Region had sufficient data for this projection (*9*).

Despite these improvements in both demand-reduction policy measures and monitoring, the EMR is the only WHO region for which smoking prevalence was projected to increase by 2025 in the 2018 trend report (*9*). Several issues can be identified to explain this (*13*).

First, many countries are stagnating at an intermediate level. Performance at this level is not effective for prevalence reduction (*14*). Highest level implementation is required. This intermediate coverage is coupled with large proportions of the Region's population that are

Figure 2 Prevalence projections for the WHO Regions, 2015 vs. 2018 trend report



covered at the lowest level, especially for Health Warnings and Taxation.

Second, many countries are not maintaining positive policy implementation and upward progress. Between 2007 and 2018 there were many cases of countries' performance dropping for particular measures, and even since 2016 this has occurred several times. This instability in tobacco control efforts threatens any long-term achievement in reducing prevalence and the disease burden of tobacco use.

Third, many countries lack a comprehensive tobacco control strategy. Across all editions of the Report (data from 2007 to 2018) only one country (Islamic Republic of Iran) has achieved the highest level for more than 3 MPOWER measures. A comprehensive tobacco control approach is key for reducing prevalence (*15*), as is evident in countries that have achieved significant reductions, such as Brazil, Turkey and Uruguay (*5,9*).

Fourth, poor compliance with national tobacco control laws is still a major problem. Many countries in the Region do not fully enforce the tobacco control laws that they have passed. If a country does not enforce such legislation, then while it may be formally performing at the highest level for a particular MPOWER measure, it will not achieve the intended reduction in tobacco use. Lack of compliance is seen most markedly for Smoke-free Policies. While over 60% of people in the Region are formally covered at the highest level for this measure, there are very low levels of compliance among many countries, including almost all of the highest achieving countries.

The way forward

While there is much work to be done to achieve highest level implementation of all MPOWER measures, the analysis indicates certain specific priority areas. First, more people should be lifted out of lowest level coverage for both Health Warnings and Mass Media.

Second, taxation on tobacco products should be increased to combat low coverage at the highest level and high coverage at the lowest level. Decreasing the affordability of cigarettes in this way is recognized as the most effective means to reducing prevalence (*16*). Multi-sectoral work that recognizes the health and economic benefits of increasing taxation to more than 75% of the retail price is needed. In addition, where incomes are increasing and where inflation is taking place, taxes must continue to rise to prevent tobacco products becoming more affordable over time.

Third, it is necessary to improve access to cessation services in the Region. The EMR is by global standards far behind in terms of coverage at the highest level for this measure, and there was a large percentage decrease in the number of people covered at the highest level between 2016 and 2018. While covering the costs of all cessation services is not possible for all countries in the Region, work should be done on encouraging countries to provide brief advice in primary health care facilities, establish national tobacco quit lines (which are low cost and relatively easy to implement) and at least partially covering the cost of some medication and quitting support.

Fourth, it is crucial to maintain upward momentum by getting countries to move beyond intermediate coverage, since the MPOWER measures are only properly effective when fully implemented at the highest level (*14,17*). This requires political commitment to be achieved in a sustainable way. Countries should aim to protect the tobacco control legislation they implement to prevent regressive changes in the future. It is also vital that sustained upward momentum is comprehensive in covering all tobacco products, including waterpipe and novel tobacco products like electronic nicotine delivery systems (ENDS) and heated tobacco products (HTPs).

Fifth, to translate legislative and regulatory success into prevalence reductions, countries must drastically improve their governance and enforcement. Legislative achievement at the highest level is not enough for prevalence reduction. It should be recognized that such improvements in enforcement mechanisms (e.g., via increased sanctions and monitoring) benefit all sectors of society.

Sixth, increasing the scale, scope and frequency of monitoring systems for tobacco use is key to gaining an accurate picture of tobacco use prevalence and trends in the Region. This monitoring should include both adult and youth prevalence and all tobacco products, including waterpipe and novel products like ENDS and HTPs.

Any efforts to improve tobacco control in the EMR must take into account the strong presence of the (multi-national and national) tobacco industry. Alliances between governments and the tobacco industry are clear (*18*). The industry is also exploiting the lack of stability that exists in many parts of the Region (*19*). Any serious attempt to strengthen tobacco control at the country level must fully consider the implementation of FCTC Article 5.3 to avoid any industry interference (*20*).

If tobacco control policies were implemented at the highest level, it is highly likely that a significant reduction in smoking prevalence would be achieved (21). For four representative countries of the Region considered (Egypt, Lebanon, Pakistan and Tunisia), a reduction in prevalence of between 21% and 35% is estimated if all MPOWER measures were fully implemented (*21*).

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Situation de la lutte antitabac dans la Région de la Méditerranée orientale : progrès dans la mise en œuvre des mesures MPOWER.

Résumé

Contexte : Les mesures MPOWER mises en place par l'Organisation mondiale de la Santé (OMS) constituent un ensemble de recommandations très efficaces en matière de lutte antitabac issues de la Convention-cadre de l'OMS pour la lutte antitabac, destinée à aider les pays à réduire la prévalence de la consommation de tabac. Le rapport de l'OMS sur l'épidémie mondiale de tabagisme est publié tous les deux ans afin de suivre la mise en œuvre au niveau mondial de ces mesures.

Objectifs : La présente étude avait pour objectif d'évaluer de manière critique la situation concernant la mise en œuvre des mesures MPOWER dans la Région de la Méditerranée orientale.

Méthodes : Les données ont été collectées en vue de la rédaction des rapports de l'OMS sur l'épidémie mondiale de tabagisme, en privilégiant l'édition 2019 qui est la plus récente. Les chiffres concernant la couverture de la population régionale ont été calculés à l'aide de ces données et des chiffres de la population des pays de la Région.

Résultats : Entre 2007 et 2018, pour toute mesure MPOWER, on a observé 29 cas de pays ayant progressé au plus haut degré d'exécution ; 23 cas de pays étant passé du niveau le plus faible au niveau intermédiaire ; 12 cas de pays ayant régressé par rapport au plus haut niveau ; et 18 cas de pays ayant régressé au degré le plus bas. Cinquante-sept pour cent de la population est couverte au plus haut niveau d'exécution en ce qui concerne la mesure de suivi ; 63,7 % concernant la mesure relative aux politiques sur les environnements sans fumée ; 6,7 % pour la mesure relative au sevrage ; 60,7 % concernant la mesure relative aux mises en garde sanitaires ; 37,4 % concernant la mesure relative aux médias ; 29,4 % concernant la mesure relative à l'interdiction de la publicité et 16,1 % concernant la mesure relative à la taxation.

Conclusions : Les pays doivent travailler de manière globale afin de renforcer la lutte antitabac. Les priorités régionales devraient inclure le passage du niveau de couverture le plus bas à un niveau supérieur pour un plus grand nombre de personnes en ce qui concerne les mesures relatives aux mises en garde sanitaires et aux médias, l'augmentation de la taxation sur les produits du tabac et l'amélioration de l'accès aux services de sevrage.

وضع مكافحة التبغ في إقليم شرق المتوسط: تقدم في تطبيق التدابير الستة (MPOWER).

فاطمة العوا، دوجلاس بيتشير، جواد اللواتي، رءوف الابشيهي، هبة جودة، تشارلز فريزر

الخلاصة

الخلفية: تدابير منظمة الصحة العالمية الستة هي مجموعة من التدابير ذات الكفاءة العالية لمكافحة التبغ، وهي مبنية على اتفاقية منظمة الصحة العالمية الإطارية بشأن مكافحة التبغ، وتهدف إلى مساعدة البلدان على تقليص معدل انتشار تعاطي التبغ. ويُنشَر تقرير منظمة الصحة العالمية بشأن وباء التبغ العالمي كل عامين بغرض رصد تطبيق هذه التدابير على مستوى العالم.

الأهداف: هدف هذا الاستعراض إلى إجراء تقييم نقدي لحالة تطبيق التدابير الستة في إقليم شرق المتوسط.

طرق البحث: جُمعت البيانات نحو إعداد تقارير منظمة الصحة العالمية بشأن وباء التبغ العالمي، مع التركيز على أحدث نسخة لعام ٢٠١٩. وحُسبت أرقام التغطية السكانية الإقليمية باستخدام هذه البيانات وأرقام تعداد السكان لبلدان الإقليم.

النتائج: كانت هناك ٢٩ حالة لبلدان تتقدم نحو أعلى مستويات الإنجاز، و٢٣ حالة لبلدان تتقدم من أدنى المستويات نحو مستويات متوسطة، و١٢ حالة لبلدان تهبط من أعلى المستويات، و١٨ حالة لبلدان تهبط إلى أدنى المستويات، وذلك بين عامي ٢٠٠٧ و٢٠١٨ وفيما يخص أي تدبير من مجموعة التدابير الستة. وشملت أعلى مستويات تدبير الرصد ٧,٥٧٪ من الأشخاص، و٧,٦٣٪ في تدبير السياسات الخاصة بالأماكن الخالية من التدخين، و٧,٦٪ في تدبير الإقلاع عن التدخين، و٧,٦٠٪ في تدبير التحذيرات الصحية، و٤,٣٧٪ في تدبير وسائل الإعلام، و٤,٢٩٪ في تدبير حجب الدعاية للتبغ، و١,١٦٪ في تدبير فرض الضرائب.

الاستنتاجات: يتعين على البلدان العمل بشمولية من أجل تحسين مكافحة التبغ. وينبغي أن تتضمن الأولويات الإقليمية رفع المزيد من الأشخاص من أدنى مستويات التغطية في تدابير التحذيرات الصحية ووسائل الإعلام، وزيادة الضرائب على منتجات التبغ، وتحسين الوصول إلى خدمات الإقلاع عن التدخين.

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Smoking cessation services in the Eastern Mediterranean Region: highlights and findings from the WHO Report on the Global Tobacco Epidemic 2019

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Abstract

The report aimed to review and assess the status of tobacco cessation services in the Eastern Mediterranean Region (EMR). Nearly 70% of people in the Region have legal access to nicotine-replacement therapy but for 77% of these people the costs of the treatment are not covered. Bupropion and Varenicline are legally available in 10 and 11 EMR countries respectively. Just under 50% of people in the Region have access to at least some cessation support in primary health care facilities. Around 32% of people have access to a national toll-free quit line. Costs for cessation services are fully covered in few EMR countries; however, cessation services in the Region must be improved. Member States should aim to increase the availability of, and financial support for, cessation treatments and support, which should be prioritized in primary health care facilities.

Keywords: smoking cessation; tobacco control; Eastern Mediterranean Region, substance use, addiction

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Introduction

Use of tobacco continues to be one of the major public health issues worldwide (*1*). According to the World Health Organization (WHO), tobacco kills almost half of its consumers, equivalent to nearly 7 million people annually (*2*). Without improvement, the number of tobacco-caused deaths will reach 8.3 million in 2030 (*3*). Nearly 80% of the 1.1 billion smokers globally live in low- and middle-income countries and it is in these countries that the burden of tobacco-related diseases and deaths is the heaviest (*2*). Supporting current smokers to quit smoking should be a key part of comprehensive tobacco control programmes and will contribute to reducing the burden of disease and improving population health (*4*). It is estimated that halving global adult consumption of tobacco by 2020 would avert around 180 million deaths by 2050 (*5*).

The WHO Eastern Mediterranean Region (EMR) consists of 22 high, middle and low-income countries/territories (Afghanistan, Bahrain, Djibouti, Egypt, the Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen). In this Region smoking prevalence is high, especially among males (36.8%) (*6–8*). Globally smoking rates are falling and projected to continue to decline, but unlike all other WHO regions, smoking rates in the EMR are currently estimated to increase (*2,9*). This calls for urgent action in the area of smoking cessation services.

The importance of cessation services to comprehensive tobacco control efforts is recognized in Article 14 of the WHO's Framework Convention on Tobacco Control (FCTC). WHO guidelines for this article recommend developing a comprehensive cessation support system to provide a range of services, including advice in primary care facilities, national toll-free quit lines, specialist cessation support and (free or low-cost) medication (*10*).

Presently, there has been no analysis of the smoking cessation services currently provided across EMR countries. To this end, this study examines and discusses the current status of smoking cessation support and treatment in the Region and provides recommendations for the way forward.

Methods

Data on cessation services in the countries collected for the WHO Report on the Global Tobacco Epidemic 2019 were used (*11*), primarily from official reports by WHO FCTC Parties to the Conference of Parties (COP) in 2018, and via a questionnaire sent to tobacco control focal points in the ministry of health of the country. Data published in the 2019 WHO Report were correct as of 31 December 2018. Data on the availability and cost of certain specific drugs (bupropion and varenicline), although not published in the 2019 WHO Report, were collected and recorded as part of the same mechanism.

Regional population coverage figures were calculated using the 2018 population figures from the Population Division of the United Nations Department of Economic

and Social Affairs (the same source as the WHO Report on the Global Tobacco Epidemic 2019). Percentages were calculated by summing the populations of the relevant countries and considering the result as a percentage of the overall population of the Region.

Results

Nicotine replacement therapy treatments are legally available in just under two thirds of the countries of the Region (Afghanistan, Bahrain, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Morocco, Oman, Pakistan, Palestine, Qatar, Saudi Arabia, Tunisia and United Arab Emirates). Given the population of the Region and the population size of these countries, this means that almost 70% of people have legal access to Nicotine replacement therapies. Furthermore, Nicotine replacement therapies can be bought in pharmacies without a prescription in 10 countries. In 3 countries (Morocco, Qatar and Tunisia) a prescription is needed. One country (Pakistan) did not provide information. Six countries include nicotine replacement therapies on their essential drug list. Of the countries where nicotine replacement therapy is available, costs are fully covered by national health insurance in 6 countries (Bahrain, Jordan, Kuwait, Qatar, Saudi Arabia and Tunisia), partially covered in Iraq and the United Arab Emirates, and not covered in the remaining 6 countries. Given population numbers, this means that for over 75% of the people who have legal access to nicotine replacement therapy in their country, this treatment is not cost-covered.

Bupropion and varenicline[1] are legally sold in 10 and 11 countries respectively, but in very few countries are the costs for these drugs fully covered. The cost of bupropion is fully covered in Saudi Arabia and partially covered in Iraq and Qatar. For all countries in which bupropion is legally available and that provided information (7 countries), a prescription is required to buy the drug. The cost of varenicline is fully covered in Qatar and Saudi Arabia and partially covered in Jordan and the United Arab Emirates. Varenicline is available only with a prescription in 9 countries and without a prescription in the United Arab Emirates (1 country, the Islamic Republic of Iran, did not provide information).

Smoking cessation support is available in at least some (i.e., less than half of all) primary health care facilities in 16 countries. This means that just under 50% of people in the Region have, in principle, access to at least some cessation support via primary health care facilities in their country. In 4 countries (Morocco, Saudi Arabia, Syrian Arab Republic and Tunisia) this support is available in most (i.e., more than half of all) primary health care facilities. The cost for such support is at least partially covered in 12 of the 16 countries. Costs are fully covered in Bahrain, Jordan, Kuwait, Qatar and Saudi Arabia. Smoking cessation support is not available in any primary health care facility in Djibouti, Egypt, Oman, Pakistan, Somalia and Yemen (amounting to just over half of the population of the Region).

Cessation support and treatment is available in at least some hospitals in 9 countries in the Region, and in 7 of these countries the costs are partially covered. Costs are only fully covered in Bahrain, Qatar and Saudi Arabia. Nine countries of the Region (Egypt, Islamic Republic of Iran, Jordan, Kuwait, Libya, Pakistan, Qatar, Saudi Arabia and the United Arab Emirates) also offer cessation support in dedicated tobacco cessation centres. All of these countries at least partially cover the costs for this support. In Kuwait, Saudi Arabia and the United Arab Emirates these costs are fully covered. Just over 32% of people in the Region have access to a national toll-free quit line (provided in Egypt, Islamic Republic of Iran, Kuwait, Saudi Arabia and the United Arab Emirates).

Most countries in the Region do not cover the full cost of cessation treatment and support. Cost coverage is best in primary health care facilities, for which 5 countries (Bahrain, Jordan, Kuwait, Qatar and Saudi Arabia) fully cover the cost of cessation treatment and support, and 7 further countries partially cover this cost. For hospitals and specialized cessation centres, less than half of the countries in the Region partially cover the costs of cessation support. Only 3 countries fully cover the cost of cessation support in these locations (hospitals: Bahrain, Qatar, Saudi Arabia; specialized cessation centres: Kuwait, Saudi Arabia, United Arab Emirates).

Discussion

Primary health care plays a pivotal role in initiating and maintaining smoking cessation efforts (*12*). As recognised by WHO (*10*), utilizing primary health care infrastructure in this way can allow widespread cessation systems to be rapidly introduced. In addition, counselling in such facilities by health workers other than physicians can allow the burden on the public health care system to be reduced (*13*). Despite these considerations, as described in the above analysis, a disappointingly small proportion of people in the Region live in countries where at least some primary health facilities offer cessation support. Very few countries provide such support in most facilities or fully cover the cost of the support. Unlike specialized cessation centres, which usually exist in only limited numbers, primary health care providers have the potential to reach a large proportion of a country's tobacco users with cessation support. This opportunity is largely being missed in the Region.

As recognized by WHO (*10*), nicotine replacement therapy should be made available to people in their countries as an evidence-based, effective medical aid for smoking cessation. Indeed, as recognized above, most people in the Region (70%) live in countries where nicotine replacement therapy is legally available. The problem, however, is that for an even larger proportion of these

[1] Bupropion is an antidepressant drug that reduces nicotine cravings and withdrawal symptoms. Varenicline reduces nicotine cravings and decreases the pleasurable effects of products containing nicotine.

Table 1 **Tobacco Cessation Interventions in the Eastern Mediterranean Region**

Tobacco cessation interventions	Number of countries with availability of service		Number of countries where cost is covered	
	Majority availability	Partial availability	Fully	Partially
Tobacco Cessation Support				
In primary care facilities	4	12	5	7
In hospitals	2	7	3	4
In specialized cessation centres		9	3	
Nicotine replacement therapy		14	6	2
Bupropion		10	1	2
Varenicline		11	2	2
National toll-free quit-line		5	–	

people (77%), the cost of nicotine replacement therapy is not covered at all via their national health insurance scheme. The resulting financial commitment to cessation products is especially detrimental for cessation efforts in lower-income countries. One reason for this discrepancy between legal availability and financial support may be that while many countries allow nicotine replacement therapies to be sold, far fewer include it on their essential drug list.

In addition, rates of access to non-nicotine-containing medication (i.e. bupropion and varenicline) are much lower than for nicotine replacement therapy. This is despite the fact that these drugs have been shown to improve cessation rates, especially when combined with behavioural support (*14*). In general, this lack of accessibility to both nicotine replacement therapy and other medication for cessation is unfortunate, especially given that quit rates can be increased by 3 to 6 times with medications (and appropriate behavioural support) (*15*).

Currently, less than a third of people in the Region have access to a toll-free quit line in their country. Such lines are an effective way for tobacco users who are ready to quit to easily access useful information and behavioural counselling (*16*) and they have the potential to reach up to 6% of all tobacco users per year (*17*). Those that use quit lines increase their absolute quit rate by 2 to 4 percentage points above quitting without assistance (*18*); this corresponds to a doubling in success rate (*19*). In addition, if the quit line is 'proactive' – for instance, counsellors make follow-up calls to the tobacco users who want to quit – then this rate can be increased further (*20*). A toll-free quit line is also relatively cheap to implement (*11*).

Few countries in the Region fully cover the cost of tobacco cessation support and medication. Disappointingly, this is even the case in primary health care facilities. Unsurprisingly, the countries that do fully cover the costs of these services and pharmacotherapies are almost exclusively the high-income Gulf Cooperation Council (GCC) countries, which have the financial resources to provide such support (*21*). Ideally, pharmacotherapy and counselling would be brought under national health insurance schemes to ensure widespread access and increase the proportion of smokers who attempt to quit, use tobacco cessation treatment and succeed in quitting (*22*).

Challenges

As more high-income nations tighten their tobacco regulations and increase their control efforts, the low and middle-income EMR countries – with their relatively relaxed tobacco control policies – may present a 'safe haven' for the tobacco industry (*6*). One significant challenge in this context is the lack of political commitment and resources in the Region to pursue substantive tobacco control reform. In the area of cessation support this is especially significant, given the need for significant financial commitment in providing the needed services. The problem is made worse by prolonged political instability in many countries in the Region.

Another challenge in increasing access to cessation services is simply a lack of the required infrastructure to enable such services to be implemented. Countries need to ensure widespread access to primary health care facilities before effective cessation support efforts can be implemented in such facilities. Increasing awareness among the population regarding the services that are available to them is also key in this regard.

Training and practices among health care workers pose a further challenge. Screening for, and recording, tobacco use is not a common practice among health care practitioners. Often they are not trained to monitor this use or provide other cessation support, including encouraging a quit attempt and referring to specialised tobacco dependence treatment centres (*23,24*). In addition, research shows that tobacco control content in education centres for health professionals is inadequate (*25*). There is also a high prevalence of tobacco use among physicians and other health care workers (*26–29*), which undermines the central role that health care professionals should play in cessation support and in diminishing the social acceptability of tobacco use (*10*).

Way forward

The EMR is the only WHO region for which prevalence is not projected to decrease given current tobacco control

efforts (*9*). This calls for quick and decisive action in all areas of tobacco control, including in providing cessation services to smokers. This report shows that while some effort is being made in this area, much more can and should be done. The following specific actions are recommended in light of the above analysis.

Availability of treatments

Countries should work to increase the availability, and decrease the cost, of evidenced-based cessation pharmacotherapies, including nicotine replacement therapy, bupropion and varenicline. This can be at least partly achieved by drug registration, direct import, collective bargaining and appropriate coordination with generic manufacturers (*10*).

From legal availability to financial support

The analysis shows that there is a large gap between the legal availability of a specific medication or means of support and this being financially accessible to the population. From the analysis, this is perhaps most evident for the accessibility of nicotine replacement therapy. Countries must be encouraged to move from simply allowing the sale of the various pharmacotherapies to committing to covering their cost, at least partially. While for many countries fully covering the costs of all medications will not be possible, through prioritization and partial coverage or subsidies, the accessibility of these treatments can be greatly increased (*30*).

Quit lines

More countries should (and certainly could) establish a national quit-line for cessation support. As the discussion noted, this is a cost-effective measure that does not require significant investment in infrastructure. For several countries in the Region, if they were to implement such a quit line they would be performing at the highest level for the WHO's cessation measure in the MPOWER package (*11*).

Primary health care

When investing in cessation support, countries should prioritize providing this support in primary health facilities, given their reach and presence in local communities. Surveillance in this area should also be increased as there are no significant studies on the number of smokers currently receiving cessation advice from primary health care facilities or on quitting rates after receiving such advice.

Health care workers

When introducing cessation schemes and projects, governments should ensure that health care workers receive the necessary training to effectively deliver the intended content and support to patients and current smokers (*23*). In addition, work should be done on discouraging smoking among this group. Policy change, backed by strong political commitment, is necessary to realise the benefit of tobacco control initiatives. This is particularly true in the low and middle-income countries of the Region, where cessation support, among other control measures, needs to be prioritized as an urgent public health intervention (*31*).

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Services de sevrage tabagique dans la Région de la Méditerranée orientale : faits marquants et conclusions issus du Rapport de l'OMS sur l'épidémie mondiale de tabagisme, 2019

Résumé

Le présent rapport a pour objectif d'examiner et d'évaluer l'état des services d'aide au sevrage tabagique dans la Région de la Méditerranée orientale. Près de 70 % des habitants de cette Région bénéficient d'un accès légal aux traitements de substitution nicotinique (TSN), mais pour 77 % d'entre eux, les coûts de ces traitements ne sont pas pris en charge. Le bupropion et la varénicline sont légalement disponibles dans 10 et 11 pays de la Région de la Méditerranée orientale, respectivement. Un peu moins de 50 % de la population de la Région a accès à au moins une forme d'aide au sevrage tabagique assurée par les établissements de soins de santé primaires. Près de 32 % des habitants ont accès à un service téléphonique d'aide au sevrage tabagique national et gratuit. Les coûts des services d'aide au sevrage tabagique sont entièrement pris en charge dans un nombre restreint de pays de la Région ; ces services doivent cependant être améliorés. Les États Membres devraient se fixer pour objectif d'accroître le soutien financier et d'améliorer la mise à disposition de traitements et d'une aide pour le sevrage tabagique, qui devraient constituer une priorité dans les établissements de soins de santé primaires.

خدمات الإقلاع عن التدخين في إقليم شرق المتوسط: أبرز التطورات والنتائج من تقرير منظمة الصحة العالمية بشأن وباء التبغ العالمي لعام ٢٠١٩

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الخلاصة

هدف هذا التقرير إلى استعراض حالة خدمات الإقلاع عن تعاطي التبغ وتقييمها في إقليم شرق المتوسط. ويتمتع قرابة ٧٠٪ من الأشخاص في الإقليم بإمكانية الحصول بطريقة قانونية على العلاج ببدائل النيكوتين، غير أن تكاليف هذا العلاج ليست في متناول ٧٧٪ من هؤلاء الأشخاص. ويتوفر عقار البوبروبيون في ١٠ بلدان والفارينيكلين في ١١ بلداً من بلدان إقليم شرق المتوسط بصورة قانونية. كما أن نسبة الأشخاص الذين يتوفر لهم على الأقل بعض الدعم للإقلاع عن التدخين في مرافق الرعاية الصحية الأولية أقل من ٥٠٪. ويتوفر لقرابة ٣٢٪ من الأشخاص خط هاتفي مجاني للإقلاع عن التدخين. وتُغطّى تكاليف خدمات الإقلاع بالكامل في بلدان قليلة من إقليم شرق المتوسط، إلا أنه يتعين تحسين خدمات الإقلاع في الإقليم. وينبغي للدول الأعضاء أن تسعى إلى زيادة توفر علاجات الإقلاع ودعمه وتوفير الدعم المالي لذلك، وينبغي منحه الأولوية في مرافق الرعاية الصحية الأولية.

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Evidence from the Lebanon Global School-based Student Health Survey on *midwakh* tobacco smoking in school students: a harbinger of the next global tobacco pandemic?

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Abstract

Background: Cigarette smoking is the most common form of tobacco consumption but other methods have grown in popularity. In the United Arab Emirates and other Gulf countries, smoking *dokha*, a form of tobacco mixed with herbs and spices in a *midwakh* pipe, is common.

Aims: The aim of this study was to determine the prevalence of *midwakh* use in school students in Lebanon and factors associated with its use.

Methods: Data on tobacco use from the Lebanon Global School-based Student Health Survey (GSHS), 2017 were analysed, including current *midwakh* use (defined as midwakh use at least once in the 30 days before the survey). The survey includes school students in grades 7–12 (12–18 years). Current *midwakh* use was analysed according to sociodemographic and tobacco-related variables using bivariate and logistic regression analyses.

Results: Of the 5590 students included in the analysis, 4.6% were current *midwakh* users. Current midwakh use was significantly more prevalent in students 13 years and older and in male students ($P < 0.01$). Current use was also statistically significantly more prevalent in students in public than private schools. Current cigarette smoking (OR = 15.22; 95% CI: 11.08–20.90), ever use of a waterpipe (OR = 9.61; 95% CI: 6.66–13.86) and parental smoking (OR = 1.56; 95% CI: 1.05–2.31) were also significantly associated with current *midwakh* use.

Conclusion: Although *midwakh* use is low in Lebanon, the patterns of association of *midwakh* use are similar to those of cigarette and waterpipe smoking in young people. Further research is needed to understand the context of *midwakh* use and prevent it from spreading.

Keywords: tobacco use, smoking, midwakh pipe, students, Lebanon

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Introduction

Although tobacco use globally is decreasing, it is on the rise in Africa and the Eastern Mediterranean Region. It kills 6 million people every year worldwide, and this number is predicted to increase to 8 million each year by 2030 *(1–3)*. Cigarettes are the most common type of tobacco consumed globally; however, other types of consumption – often called alternative tobacco products – have increased in popularity, such as waterpipe smoking *(1)*.

In the Arab world, consumption of alternative tobacco products, including waterpipe smoking, has increased rapidly, particularly among young people *(4)*. *Dokha* – an Arabic word meaning dizziness – is another alternative tobacco product that is gaining popularity in the Arab world *(5)*. *Dokha* is a form of tobacco leaves mixed with dried fruits, herbs, bark, spices, and dried flowers, which is smoked using a narrow pipe called a *midwakh (5)*. About 0.5 g of *dokha* is placed in the *midwakh*, one or two deep inhalations are taken to burn the *dokha*, and this is done an average of 12 times a day *(6)*. *Dokha* is available in different strengths ranging from mild to strong *(4)*.

Little research has been done on *dokha* smoking using a *midwakh*, with most published reports coming from the United Arab Emirates and anecdotal reports coming from elsewhere in the Gulf region. Emerging evidence suggests that *dokha* is not a safe alternative to traditional cigarette smoking. Acute effects of smoking *dokha* include increased systolic blood pressure, heart rate and respiratory rate *(4,5,7,8)*. Chronic use of *dokha* can result in excessive stimulation of the sympathetic nervous system leading to increases in heart rate and cardiac output which can damage blood vessels *(8)*. The nicotine in *dokha* can also cause constriction of the airways resulting in shortness of breath or tachypnoea *(8)*. Median carbon monoxide and salivary cotinine levels in *midwakh* smokers were similar to those of cigarette smokers and higher than those of non-smokers *(9)*.

The negative health outcomes of *dokha* smoking are particularly concerning given its increasing prevalence and popularity, especially among young people *(6,10)*. *Dokha* is preferred to cigarettes and other alternative tobacco products such as waterpipe (hookah) because it: produces a strong light-headed sensation, satisfies nicotine craving more quickly, produces less second-hand smoke, has no smell, does not stain the lips, is less bulky than a waterpipe and even a cigarette packet, and is relatively cheap *(6,10)*. About 89% of the population of the United Arab Emirates are non-nationals, including nationals of the United States of America (USA) and other high-income countries. A study of ninth-grade male expatriate school students, found that 15% had used a *midwakh* at least once in the previous 30 days, with an average of 25 days of use, and 2–3times a day *(11)*. A more recent study found that the prevalence rates of ever and current smoking with a *midwakh* in expatriate school students (North American, Australian and/or European) in the United Arab Emirates were not significantly different from those of Emirati students *(12)*. Therefore, while *midwakh* use has been most popular in the United Arab Emirates and other Gulf countries, this alternative tobacco product threatens to spread within and beyond the Arab world *(5,12,13)*.

The objective of our study was to assess the prevalence of *midwakh* smoking in middle- and high-school students in Lebanon, and to explore sex and age differences and associations with smoking other tobacco products.

Methods

The Global School-based Student Health Survey (GSHS) is a surveillance tool developed by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), and conducted in collaboration with ministries of health and education *(14)*. It is a school-based survey conducted mainly among a representative sample of adolescents in in grades 7 through 12 (about ages 13–18 years).

Sampling procedures

Centers for Disease Control and Prevention determined the sample size and sampling procedures using a sampling frame provided by the Ministry of Education and Higher Education in Lebanon. In order to get representative data with a 5% error, the minimum sample size was calculated to be 1534 students. A two-stage cluster sample design was used to select a representative sample of students in grades 7–12 in schools in Lebanon. The first stage was a systematic sampling of schools with probability proportional to school enrolment size. A total of 64 schools were selected. The second stage was equal probability sampling of classrooms: all classes with most of the students in grades 7–12 were included in the sampling frame. The list of selected schools and classrooms was shared with the Ministry of Education and Higher Education for data collection. All students in the sampled classrooms were eligible to participate in the survey. Out of the 64 selected schools, 56 agreed to participate, giving a school response rate of 88%. Of the 6152 students selected, 5717 completed the survey, giving a student response rate of 93%. Hence, the overall response rate was 82% (0.88 × 0.93 × 100). Of the completed surveys, 5708 were usable after data cleaning.

GSHS questionnaire and main measures

The 2017 GSHS conducted in Lebanon used an 88-item questionnaire: 54 core questions and 34 core-expanded or Lebanon-specific questions. The questionnaire was developed in English and Arabic and students were allowed to choose which language they wanted to complete it in.

For the purpose of our analysis, we included the following measures:

Sociodemographic data: age (≤ 12 years, 13–15 years, 16–17 years and ≥ 18 years), sex (male/female), school grade (7–12) and type of school (private/public).

Tobacco use: Our main outcome was current midwakh use (yes/no), which was assessed by the following question: "During the past 30 days, on how many days did you smoke a *midwakh* or smoking pipe?" We categorized a response of 0 days as non-current midwakh use and all other responses as current midwakh use. Only 5590 students answered this question. Further analyses (results available on request) showed that the students who did not respond to the *midwakh* question did not differ significantly from those who did answer this question in terms of sociodemographic and other tobacco use variables. Therefore, the data are missing at random and less likely to introduce bias and affect our results. Other questions on tobacco use included: age at which students first tried cigarettes; waterpipe use (ever/never); number of days they had smoked cigarettes in the 30 days before the survey; exposure to second-hand smoke in the 7 days before the survey, including any form of smoked tobacco use by parents or guardians.

Data collection

The survey is self-administered and students answered it in school during school hours. Students were informed about the survey and its content, their rights and the voluntary nature of participation. Students recorded their answers on an answer sheet that could be scanned by computer. Survey procedures were designed to protect the students' privacy and allow for anonymous and voluntary participation.

Data analysis

Epi Info and Stata software was used for data analyses. To ensure the data were representative of all students in grades 7–12, a weighting factor was applied to each student record to adjust for non-response and for the varying probabilities of selection. Univariate and bivariate analyses were performed, and also adjusted logistic regression analyses to control for age, sex and school type (these three variables were statistically significantly associated with *midwakh* use in the bivariate analysis). Data are reported as frequencies and odds ratios (ORs) and 95% confidence intervals (95% CIs).

Results

A total of 5590 students were included in the analysis. Of these students, 3309 (59.2%) were female, 3597 (64.3%) were in public schools, 3341 (59.8%) were aged 15 years or younger and 2326 (41.6%) were in grades 7 or 8 (Table 1).

Overall, 275 (4.6%) students were current *midwakh* users – had used a *midwakh* at least once in the 30 days before the survey. Current *midwakh* use was significantly more prevalent in students 13 years and older and in male students ($P < 0.01$) (Table 1). Current use was also statistically significantly more prevalent in students in public than private schools (Table 1).

Current *midwakh* use was significantly associated with current cigarette smoking (OR = 15.22; 95% CI: 11.08–20.90, $P < 0.001$) and starting cigarette smoking younger than 14 years of age among cigarette smokers (OR = 2.34; 95% CI: 1.49–3.68, $P = 0.001$), after adjusting for age, sex and school type. *Midwakh* use was also significantly associated with ever smoking a waterpipe (OR = 9.61; 95% CI: 6.66–13.86, $P < 0.001$) and parental smoking (OR = 1.56; 95% CI: 1.05–2.31, $P = 0.029$) after controlling for age, sex and school type (Table 2). Exposure to second-hand smoke was not significantly associated with current midwakh use ($P = 0.128$).

Discussion

Our study provides prevalence rates of *midwakh* use outside the United Arab Emirates and other Gulf areas, where it has been mostly confined. We also explored sex and age differences, and associations with smoking other tobacco products. Overall, 275 (4.6%) of students in grades 7–12 currently smoked *midwakh*; current use ranged between 2.4% in students 12 years or less to 8.6% in students aged ≥ 18 year or more. In secondary-school students (grades 10–12, ages 15–17 years), *midwakh* use ranged from 4.2% to 5.4% of students. These rates are substantially lower than those reported by secondary-school students in the United Arab Emirates (24%) *(7)*. To our knowledge, no other studies have reported the prevalence of *midwakh* use in middle-school students.

Although the prevalence of *midwakh* use is still low in Lebanon, *dokha* use by young adolescents is still concerning, particularly in view of the associations we found with cigarette and waterpipe smoking and parental smoking. Our findings concur with previous evidence on the determinants of smoking in young people *(15–17)*. This situation is of concern because, despite the existence of tobacco control policies at the national level in Lebanon, the overall policy environment in Lebanon – that is, lack of effective enforcement of existing policies (law 174 banning indoor smoking and smoking in public areas) and absence of other regulatory policies (taxation) – is still conducive to tobacco use *(18)*. In addition, government commitment to tobacco product regulation and restrictions on access for young people is lacking, which enables the sale and promotion of tobacco products in this age group.

Table 1 Sociodemographic characteristics of the sample overall and by current midwakh use (smoked midwakh on one or more days in the past 30 days)

Variable	Students No. (%)	Midwakh use Weighted % (95% CI)	OR (95% CI)	*P*-value
Total	5590 (100)	4.6 (3.5–5.9)	–	
Sex				
Male	2273 (40.7)	6.7 (5.1–8.8)	1 (–)	
Female	3309 (59.2)	2.7 (1.9–3.7)	0.38 (0.27–0.53)	< 0.001*
Age (years)				
≤ 12	660 (11.8)	2.4 (1.4–3.9)	1 (–)	
13–15	2681 (48.0)	4.5 (3.2–6.2)	1.91 (1.32–2.77)	0.002*
16–17	1805 (32.3)	5.1 (3.6–7.2)	2.21 (1.40 –3.47)	0.002*
≥ 18	428 (7.7)	8.6 (5.7–12.7)	3.85 (2.34–6.32)	< 0.001*
Grade				
7	1227 (21.9)	5.1 (2.9–9)	1 (–)	
8	1099 (19.7)	4.1 (2.9–5.7)	0.79 (0.40–1.53)	0.458
9	768 (13.7)	3.9 (2.9–5.2)	0.75 (0.37–1.53)	0.408
10	942 (16.9)	4.2 (2.7–6.6)	0.81 (0.54–1.23)	0.301
11	694 (12.4)	4.7 (2.5–8.8)	0.92 (0.47–1.80)	0.792
12	836 (15.0)	5.4 (4.1–7.0)	1.05 (0.65–1.70)	0.836
Type of school				
Public	3597 (64.3)	6.3 (4.1–9.7)	1 (–)	
Private	1993 (35.7)	3.6 (2.7–4.7)	0.54 (0.31–0.96)	0.037*

OR: odds ratio; CI confidence intervals.

**Statistically significant at P < 0.05.*

Table 2 Association of current *midwakh* use with other variables related to tobacco uses: logistic regression analyses

Variable	*Midwakh* use No. (%)	OR (95% CI)	P-value	ORa (95% CI)a	*P*-value
Tried a cigarette before age 14 years (of those who ever tried a cigarette)					
No	39 (7.5)	1 (–)		1 (–)	
Yes	138 (15.7)	2.31 (1.53–3.49)	0.001*	2.34 (1.49–3.68)	0.001*
Current cigarette smoker					
No	90 (1.6)	1 (–)		1 (–)	
Yes	161 (21.6)	16.61 (12.21–22.58)	< 0.001*	15.22 (11.08–20.90)	< 0.001*
Waterpipe use					
Never	34 (1)	1 (–)		1 (–)	
Ever	228 (9)	9.89 (6.78–14.45)	< 0.001*	9.61 (6.66–13.86)	< 0.001*
Parent/guardian smokes (any type)					
No	86 (3.3)	1 (–)		1 (–)	
Yes	168 (5.2)	1.61 (1.13–2.29)	0.011*	1.56 (1.05–2.31)	0.029*
Exposure to second-hand smoke					
No	59 (3.6)	1 (–)		1 (–)	
Yes	206 (4.8)	1.37 (0.94–2.0)	0.097	1.32 (0.91–1.92)	0.128

OR: unadjusted odds ratio; ORa: adjusted odds ratios; CI confidence intervals.

[a]*Controlling for age, sex and school type.*

**Statistically significant at P < 0.05.*

Exposure of young non-nationals living in the Gulf to *midwakh* use can help spread this practice globally. More than 15% of ninth-grade male expatriate students in the United Arab Emirates were current smokers of *midwakh* and smoked it regularly (25 out of 30 days on average) and often (2–3 times a day) *(11)*. In addition, data from the Global Youth Tobacco Survey on students in grades 10–12 in the United Arab Emirates indicated that about 21% had ever smoked *midwakh*, with no difference between national and expatriate students from the USA, Europe or Australia *(12)*. At least two American websites offer access to *midwakh* products *(19,20)*. The results in this study indicate that *midwakh* smoking is now present among young people in Lebanon. This situation calls for urgent global attention to prevent *midwakh* smoking from spreading further among young people and undermining tobacco control efforts.

Limitations

Only one question was asked on *midwakh* smoking in the 2017 GSHS in Lebanon, which limits a broader understanding of the pattern of use of this product in students in grades 7–12.

Conclusion

Global and regional research on midwakh smoking is just beginning. However, as with other tobacco products, understanding the patterns of midwakh use and the development of interventions to reduce its use requires research across different disciplines, such as epidemiology, health promotion, economics, engineering, medicine, chemistry, psychology, policy and others. A recent meeting in the United Arab Emirates – hosted by New York University, Abu Dhabi – brought together researchers on midwakh use and experts on alternative tobacco products used in the Arab region to draft a research agenda (21). We urge relevant regional and global organizations with an interest in reducing tobacco use (excluding the tobacco industry and foundations financed by the tobacco industry) to support research on midwakh before it becomes the next global tobacco pandemic(*22,23*).

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Bases factuelles tirées de l'Enquête mondiale en milieu scolaire sur la santé des élèves au Liban sur le tabagisme par midwakh : signe avant-coureur de la prochaine pandémie mondiale de tabagisme ?

Résumé

Contexte : Le tabagisme par cigarettes est le premier mode de consommation du tabac, mais d'autres méthodes ont gagné en popularité. Aux Émirats arabes unis ainsi que dans d'autres pays du Golfe, il est courant de consommer la *dokha*, un type de tabac mélangé à des herbes et des épices, au moyen d'une pipe appelée « *midwakh* ».

Objectifs : La présente étude avait pour objectif de déterminer la prévalence de l'utilisation de la *midwakh* parmi les élèves libanais ainsi que les facteurs qui y sont associés.

Méthodes : Les données sur le tabagisme issues de l'Enquête mondiale en milieu scolaire sur la santé des élèves au Liban en 2017 ont été analysées, y compris l'utilisation de la *midwakh* au moment de l'enquête (définie comme l'utilisation de cette dernière au moins une fois dans les 30 jours ayant précédé l'enquête). L'enquête incluait des collégiens et des lycéens (âge compris entre 12 et 18 ans). En réalisant des analyses bivariées et de régression logistique, nous avons analysé l'utilisation de la *midwakh* au moment de l'étude en fonction des variables sociodémographiques et liés au tabagisme.

Résultats : Sur les 5 590 élèves inclus dans l'analyse, 4,6 % étaient des utilisateurs de la *midwakh* au moment de l'étude. L'utilisation de la *midwakh* était significativement plus fréquente chez les élèves de 13 ans et plus et chez les élèves de sexe masculin (p <0,01). L'utilisation de la pipe était statistiquement plus répandue, de façon significative, chez les élèves des écoles publiques par rapport à ceux des écoles privées. Le tabagisme par cigarettes (odds ratio (OR) = 15,22 ; intervalle de confiance à 95 % (IC) : 11,08-20,90), le fait d'avoir déjà fumé le narguilé (OR = 9,61 ; IC à 95 % : 6,66-13,86) et le tabagisme des parents (OR =1,56 ; IC à 95 % : 1,05-2,31) étaient également fortement liés à l'utilisation de la *midwakh* au moment de l'étude.

Conclusion : Bien que l'utilisation de la *midwakh* soit peu répandue au Liban, les schémas d'association de son utilisation sont analogues à ceux du tabagisme par cigarettes et par narguilé chez les jeunes. Des recherches supplémentaires sont nécessaires pour comprendre le contexte de l'utilisation de la *midwakh* et pour éviter sa propagation.

تعاطي التبغ باستخدام المدواخ بين طلاب المدارس في لبنان: تحليل البيانات من المسح العالمي لصحة طلاب المدارس

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الخلاصة

الخلفية: يُعتبر تدخين السجائر من أكثر طرق تعاطي التبغ شيوعاً، ولكن ثمة طرقاً أخرى آخذة في الانتشار انتشاراً كبيراً. ففي الإمارات العربية المتحدة وبعض بلدان الخليج الأخرى، أصبح شائعاً تدخينُ الدوخة بالمدواخ، وهي نوع من التبغ مخلوطٌ مع أعشاب وتوابل.

الأهداف: هدفت هذه الدراسة إلى الوقوف على مدى انتشار استخدام المدواخ بين طلاب المدارس في لبنان والعوامل المرتبطة بذلك.

طرق البحث: حُللت بيانات بشأن تعاطي التبغ من المسح العالمي لصحة طلاب المدارس في لبنان لعام ٢٠١٧، وتضمنت الاستخدام الحالي للمدواخ (عُرِّف بأنه استخدام المدواخ مرةً واحدة على الأقل خلال الثلاثين يوماً السابقة للمسح). وشمل المسح طلاب المدارس في الصفوف من ٧–١٢ (١٢– ١٨ عاماً). وقد حللنا استخدام المدواخ في الوقت الحالي وفقاً للمتغيرات الاجتماعية السكانية وتلك المرتبطة بالتبغ باستخدام تحليل ثنائي المتغير وتحليل الانحدار اللوجستي.

النتائج: تبين أن ٦,٤٪ من الطلاب الذين شملهم التحليل وعددهم ٥٥٩٠ طالباً من مستخدمي المدواخ في الوقت الحالي. وكانت نسبة مستخدمي المدواخ في الوقت الحالي أعلى كثيراً في الذكور، والطلاب البالغين ١٣ عاماً فما فوق، وطلاب المدارس العامة. وقد ارتبط ارتباطاً قوياً باستخدام المدواخ في الوقت الحالي: تدخينُ السجائر حالياً (نسبة الأرجحية المُصحَّحة = ٢٢,١٥؛ فاصل الثقة ٩٥٪: ٠٨,١١–٩,٢٠)، وأي استخدام للنرجيلة: نسبة الأرجحية المُصحَّحة = ٦١,٩؛ فاصل الثقة ٩٥٪: ٦٦,٦–٨٦,١٣)؛ وتدخين الآباء (نسبة الأرجحية المُصحَّحة = ٥٦,١؛ فاصل الثقة ٩٥٪: ٠٥,١–٣١,٢).

الاستنتاج: على الرغم من انخفاض استخدام المدواخ في لبنان، إلا أن النماذج المرتبطة باستخدامه مشابهة لتلك المرتبطة بتدخين السجائر والنرجيلة في صفوف الشباب. ويلزم إجراء مزيدٍ من البحث لفهم سياق استخدام المدواخ والحيلولة دون انتشاره.

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Tobacco use in school students in Afghanistan, Oman and Kuwait and association with parental monitoring: analysis of data from Global School-based Student Health surveys

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Abstract

Background: Nationally representative data are lacking on cigarette smoking in adolescents in Afghanistan, Oman and Kuwait, which are considered low-income, middle-income and high-income countries respectively of the World Health Organization Eastern Mediterranean Region.

Aims: This study examined the effect of parental monitoring on the tobacco use of adolescent school students in Afghanistan, Oman and Kuwait.

Methods: Using data from the 2014 Afghanistan, 2015 Oman and 2015 Kuwait Global School-based Student Health surveys, factors associated with cigarette smoking and tobacco use among the students in the 30 days before the survey were analysed. These factors included: parental understanding of their problems/worries, parental awareness of how they spent their free time, parents searching their belongings without their approval, and parents checking if homework was done. Logistic regression analysis was used to determine the association between tobacco use and parental monitoring.

Results: The prevalence of cigarette smoking and/or use of other tobacco products by the students on one or more days in the 30 days before the survey was 10.6% in Afghanistan, 9.3% in Oman and 28.8% in Kuwait. Adolescents whose parents understood their problems, were aware of how they spent their free time, and checked if their homework was done were less likely to be current tobacco users in all three countries ($P < 0.05$). Adolescents in Oman and Kuwait whose parents searched their belongings were more likely to use tobacco ($P < 0.01$).

Conclusion: The prevalence of tobacco use in the adolescents, especially in Kuwait, suggests the need for better school-based health education and promotion programmes in these countries.

Keywords: cigarette smoking, tobacco use, adolescents, parents, Afghanistan, Kuwait, Oman

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Introduction

The harmful health effects of tobacco use are widely known and include damage to multiple organ systems and cancer *(1,2)*. It is one of the main causes of the disturbing increase in noncommunicable diseases. Globally, seven million people die each year because of tobacco use *(3)*. The tobacco epidemic is moving from high-income to low- and middle-income countries *(4)*. A recent burden of health study of countries of the Eastern Mediterranean Region (EMR) of the World Health Organization (WHO) identified tobacco use and systolic blood pressure as the leading causes of disability-adjusted life years (DALYs) *(5)*. Strong monitoring of the correlates of the tobacco use epidemic is needed to combat this important public health problem *(3)*.

Among the EMR Member States, Afghanistan is considered a low-income country, Oman a middle-income country and Kuwait a high-income country. Few nationally representative studies on cigarette smoking in adolescents have been carried out in these three Member States. The Global School-based Student Health Survey (GSHS) is a self-administered questionnaire that assesses various health behaviours and practices in schoolchildren, including the use of tobacco *(6)*. The GSHS was developed by WHO in collaboration with the United States Centers for Disease Control and Prevention (CDC). The survey is conducted in collaboration with the national ministries of health in each country. The data can be used to evaluate the epidemiology and burden of these behaviours and practices and to make statistically sound comparisons between countries on their profile and correlates.

In Afghanistan, the first GSHS was completed in 2014, while in Oman and Kuwait these surveys were first done in 2010 and 2011 respectively. The most recent GSHSs in Oman and Kuwait were done in 2015. This study examines the differences and similarities in adolescent tobacco use and the role of parental monitoring activities on tobacco use in these three countries using recently released GSHS data on nationally representative samples of students.

Methods

Sample

Data from the most recent GSHSs of Afghanistan (2014), Oman (2015) and Kuwait (2015) were used for a secondary analysis. Detailed information on the data collection methods, questionnaire, procedures and data are available at the CDC website *(6)*. Briefly, a two-stage cluster sampling design was used to collect data representing all students in classes 7 to 11 in Afghanistan (typically attended by students aged 13–17 years), and grades 8 to 12 (typically attended by students aged 13–17 years) in Oman and Kuwait. In stage one, schools were selected with a probability proportional to their enrolment size. In stage two, classrooms within the chosen schools were randomly selected and all students in the selected classes were eligible to participate. In Afghanistan, the school response rate was 97%, student response rate was 87%, overall response rate was 79% and 2579 students participated in the survey. In Oman, the school response rate was 98%, student response rate was 94%, overall response rate was 92% and 3468 students participated. In Kuwait, the school response rate was 97%, student response rate was 80%, overall response rate was 78% and 3637 students participated. All respondents 11 years of age or younger were recoded as 12 years old because there were so few. Respondents 18 years or older were coded as such in the original database.

Participation in the survey was voluntary and all students were informed of the anonymous nature of the questionnaire. Answers were self-reported on a questionnaire with an answer sheet that could be scanned by computer. With the exception of verifying heights and weights, no validation measures were used for the other responses in the survey, including the responses to items used for the present study.

Measurements

Current tobacco use was the dependent variable and was ascertained by two questions in the GSHS. "During the past 30 days, on how many days did you smoke cigarettes?" and "During the past 30 days, on how many days did you use any tobacco product other than cigarettes, such as …". In each of the three countries, different types of non-cigarette tobacco products were named. Response options for both questions were the same: 0 days, 1 or 2 days, 3 to 5 days, 6 to 9 days, 10 to 19 days, 20 to 29 days, or all 30 days. For the purpose of these analyses, participants were classified as a current tobacco user if they reported having smoked a cigarette or used any tobacco product for 1 or 2 days or more in the past 30 days.

Four parental monitoring questions were investigated as explanatory variables: "During the past 30 days, how often did your parents or guardians check to see if your homework was done?", "During the past 30 days, how often did your parents or guardians understand your problems and worries?", "During the past 30 days, how often did your parents or guardians really know what you were doing with your free time?", and "During the past 30 days, how often did your parents or guardians go through your things without your approval?". Response options for all four questions were the same and ranged from: never, rarely, sometimes, most of the time, or always. Responses of "most of the time" and "always" were combined for each question and coded as "yes" (i.e. having parental monitoring) and all other responses were coded as "not having parental monitoring". Additional questions asked were on: age when the respondents first tried smoking a cigarette, attempts to stop smoking in the past 12 months, number of days other people smoked in the respondents' presence in the seven days before the survey and parental tobacco use.

Statistical analysis

Use of tobacco products, cigarette smoking and other variables related to cigarette smoking (age at first smoking a cigarette, attempts to quit cigarette smoking and number of days a week other people smoked cigarettes in your presence) were examined and recorded as number of students and weighted percentages. Differences in current tobacco use in relation to the following variables were evaluated using Rao–Scott chi-squared test: age, sex, parents/guardians use of tobacco, and parental monitoring (understand your problems and worries; aware of your free-time activities, go through your things without permission and check your homework is done). This test is a design-adjusted version of the Pearson chi-squared test for categorical variables, and the design-adjusted version of *t*-test for the continuous variable age

For each country, four logistic regression analyses were done to evaluate the association between each individual parental monitoring variable and current tobacco use for each country. A logistic regression analyses including all four parental monitoring variables was then done for each country to predict the current tobacco use status. Measures are reported as unadjusted odds ratios (ORs), adjusted odds ratios (aORs) and associated 95% confidence intervals (CIs). All analyses were carried out using Stata 15.

Results

Within the recall period of the 30 days before the survey, 10.6% of students in Afghanistan, 28.8% in Kuwait and 9.3% in Oman reported having smoked cigarettes and/or used other tobacco products on one or more days.

Table 1 shows the prevalence of cigarette smoking, tobacco use, and related factors in adolescents attending school in Afghanistan, Oman and Kuwait. In Afghanistan, the percentage of the school students who were current cigarettes smokers was 7.9%, and the percentage who were current tobacco users was 7.5%. In Oman the percentages were 6.8% and 6.3% respectively for current cigarette smokers and tobacco users. In Kuwait, the percentages were 22.0% for current cigarette smokers and 22.2% for current tobacco users. Almost half the students in Afghanistan (47.4%) reported that other people had smoked in their presence in the seven days before the survey, while the percentages were 26.1% in Oman and

Table 1 Tobacco use (cigarettes and/or other forms) and associated factors in adolescent school students in Afghanistan, Kuwait and Oman

Variable	Afghanistan (*n* = 2579)	Oman (*n* = 3468)	Kuwait (*n* = 3637)
	No. (%)	No. (%)	No. (%)
Current cigarette smoker			
Yes	167 (7.9)	225 (6.8)	715 (22.0)
No	2349 (92.1)	3180 (93.2)	2693 (78.0)
Missing data	63	63	229
Age at which first tried to smoke a cigarette (years)			
Never smoked	2034 (83.7)	2927 (87.4)	2193 (65.4)
≤ 7	124 (5.4)	98 (3.0)	225 (7.1)
8 or 9	81 (3.8)	50 (1.6)	185 (6.2)
10 or 11	70 (3.1)	84 (2.6)	166 (5.2)
12 or 13	35 (1.4)	66 (2.0)	236 (7.2)
14 or 15	42 (1.7)	73 (2.2)	211 (6.5)
16 or 17	14 (0.6)	32 (0.9)	75 (2.2)
≥ 18	10 (0.3)	10 (0.3)	5 (0.2)
Missing data	169	128	341
Tried to quit cigarette smoking			
Never smoked	2261 (91.8)	3135 (92.8)	2414 (73.1)
Have not smoked in the past 12 months	62 (2.9)	71 (2.1)	246 (7.6)
Yes	82 (4.0)	102 (3.2)	412 (13.2)
No	33 (1.3)	65 (1.9)	190 (6.1)
Missing data	141	95	375
No. of days a week other people smoked cigarettes in your presence			
0	1405 (52.6)	2551 (73.9)	1234 (35.5)
1 or 2	675 (28.0)	469 (13.8)	847 (24.7)
3 or 4	209 (9.2)	155 (4.6)	451 (13.6)
5 or 6	100 (4.1)	84 (2.5)	186 (5.5)
7	145 (6.1)	176 (5.2)	696 (20.7)
Missing data	45	33	223
Current tobacco user			
Yes	184 (7.5)	210 (6.3)	735 (22.2)
No	2360 (92.5)	3217 (93.7)	2710 (77.8)
Missing data	35	41	192

All frequencies are unweighted, while percentages are weighted.

64.5% in Kuwait.

Table 2 shows the associations between current tobacco use of the school students (smoked cigarettes and/or used tobacco) and sociodemographic characteristics and parental monitoring. Significantly more current tobacco users were male: 74.9% in Afghanistan, 81.7% in Oman and 65.1% in Kuwait ($P < 0.01$). Age and current tobacco use were also significantly associated in Oman and Kuwait, with older students more likely to report tobacco use in any form ($P < 0.01$).

In all three countries, current tobacco use was significantly associated with the parental monitoring: monitoring if homework was done, parental understanding of problems and worries, and monitoring free-time activities ($P < 0.01$). Fewer school students who were current tobacco users were monitored by their parents in these ways. In Oman and Kuwait, significantly more students whose parents went over their things without their approval smoked ($P < 0.01$), but this association was not significant in Afghanistan.

Table 3 shows the results of the logistic regression analyses of the association between current tobacco use and parental monitoring activities in the school students in the three countries. In the univariate logistic regression analyses, parental understanding, monitoring of free-time activities and checking homework were statistically significant associated with lower likelihoods of smoking in the students. However, parents going

Table 2 Association between current tobacco use (cigarettes and/or other forms) and sociodemographic characteristics and parental monitoring in adolescent school students in Afghanistan, Kuwait and Oman

Variable	Afghanistan (n = 2563[a])		Oman (n = 3453[a])		Kuwait (n = 3485[a])	
	Current tobacco user					
	Yes	No	Yes	No	Yes	No
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Age (years)						
12 years or less	21 (0.8)	97 (3.2)	11 (0.3)	67 (2.0)	31 (0.9)	50 (1.3)
13	22 (0.7)	327 (10.8)	14 (0.5)	342 (9.8)	85 (2.3)	482 (12.6)
14	43 (1.7)	490 (18.6)	27 (0.9)	504 16.3)	131 (3.8)	569 (15.1)
15	45 (2.1)	466 (18.0)	70 (2.1)	669 (18.8)	170 (5.6)	472 (15.2)
16	48 (2.1)	418 (17.0)	66 (1.8)	690 (18.5)	196 (6.1)	429 (12.6)
17	27 (1.4)	240 (11.0)	79 (2.4)	648 (19.0)	240 (7.1)	383 (10.9)
18 years or more	35 (1.7)	247 (10.9)	45 (1.4)	209 (6.3)	99 (3.0)	116 (3.5)
Missing values	7	30	2	10	11	21
Mean (SD)	15.4 (1.7)	15.2 (1.7)	15.9 (1.5)	15.4 (1.5)	15.6 (1.5)	15.0 (1.5)
P-value[b]	0.496		0.006		0.001	
Sex						
Male	135 (74.9)	908 (53.2)	236 (81.7)	1377 (46.6)	586 (65.1)	1024 (43.7)
Female	86 (25.1)	1350 (46.8)	58 (18.3)	1718 (53.4)	339 (34.9)	1467 (56.3)
Missing values	27	57	20	44	38	31
P-value	0.003		< 0.0001		0.008	
Parents/guardians use tobacco						
Neither	134 (58.4)	1905 (81.8)	160 (53.8)	2747 (88.0)	366 (40.6)	1685 (68.0)
Father/male guardian	56 (25.4)	320 (15.2)	55 (18.2)	223 (7.3)	305 (34.1)	659 (26.5)
Mother/female guardian	16 (7.0)	24 (1.3)	23 8.0)	7 (0.3)	80 (8.9)	23 (0.9)
Both	15 (5.4)	13 (0.5)	19 (6.8)	15 (0.5)	88 (9.6)	39 (1.6)
Don't know	11 (3.8)	29 (1.2)	38 (13.2)	124 3.9)	60 (6.8)	77 (3.0)
Missing values	16	24	19	23	64	39
Parental monitoring (understand your problems and worries)						
Yes	48 (20.2)	1159 (54.1)	87 (10.3)	1263 (6.6)	221 (23.8)	877 (36.0)
No	174 (79.8)	977 (45.9)	203 (89.7)	1787 (93.4)	686 (76.2)	1564 (64.0)
Missing values	26	179	24	89	56	81
P-value	< 0.0001		0.001		< 0.0001	
Parental monitoring (aware of your free-time activities)						
Yes	60 (27.6)	1189 (54.8)	72 (24.2)	1360 (43.9)	238 (26.7)	1143 (47.1)
No	156 (72.4)	940 (45.2)	227 (75.8)	1728 (56.1)	651 (73.3)	1286 (52.9)
Missing values	32	186	15	51	74	93
P-value	< 0.0001		< 0.0001		< 0.0001	
Parental monitoring (go through your things without permission)						
Yes	38 (20.2)	432 (19.9)	54 (19.2)	185 (6.0)	167 (19.1)	333 (13.9)
No	190 (79.8)	1768 (80.1)	241 (80.8)	2914 (94.0)	712 (80.9)	2078 (86.1)
Missing values	20	115	19	40 0	84	111
P-value	0.9476		< 0.0001		0.008	
Parental monitoring (check your homework is done)						
Yes	55 (24.1)	1003 (44.8)	103 (35.4)	1552 (50.7)	255 (28.3)	882 (37.3)
No	178 (75.9)	1178 (55.2)	189 (64.6)	1515 (49.3)	640 (71.7)	1544 (62.7)
Missing values	15	134	22	72	68	96
P-value	0.001		0.0001		0.0003	

SD: standard deviation.

[a] *For 16 records in Afghanistan, 15 records in Oman, and 152 records in Kuwait, information on current tobacco use (defined as current cigarette smoker and/or current tobacco user) were missing.*

[b] *For differences between the mean ages of smokers and non-smokers.*

Table 3 Multivariable analysis of current tobacco use (cigarettes and/or other forms) and parental monitoring in adolescent school students in Afghanistan, Kuwait and Oman

Variable	Current tobacco use									
	Afghanistan			Oman			Kuwait			
	OR (95% CI)	P-value	aOR (95% CI)	P-value	OR (95% CI)	P-value	aOR (95% CI)	P-value	OR (95% CI)	P-value	aOR (95% CI)	P-value
Parental monitoring (understand your problems and worries)												
Yes	0.21 (0.12–0.38)	< 0.0001	0.30 (0.15–0.60)	0.002	0.61 (0.46–0.81)	0.001	0.81 (0.58–1.14)	0.217	0.55 (0.47–0.66)	< 0.0001	0.69 (0.55–0.86)	0.003
Parental monitoring (aware of your free-time activities)												
Yes	0.31 (0.18–0.56)	< 0.0001	0.58 (0.35–0.98)	0.044	0.41 (0.31–0.53	< 0.0001	0.46 (0.34–0.62)	< 0.0001	0.41 (0.35–0.47	< 0.0001	0.45 (0.37–0.55)	< 0.0001
Parental monitoring (search your belongings without permission)												
Yes	1.02 (0.50–2.09)	0.948	1.04 (0.53–2.10)	0.893	3.7 (2.25–6.11)	< 0.0001	3.52 (1.88–6.59)	< 0.0001	1.47 (1.12–1.91)	0.008	1.52 (1.15–2.02)	0.006
Parental monitoring (check your homework is done)												
Yes	0.39 (0.23–0.66)	0.001	0.80 (0.47–1.36)	0.390	0.53 (0.40–0.72)	< 0.0001	0.66 (0.45–0.95)	0.026	0.66 (0.55–0.80)	< 0.0001	0.85 (0.72–1.003)	0.054

OR = odds ratio; aOR = adjusted OR; CI: confidence interval.
Reference categories were "no" responses.

over respondents' things without their approval was significantly associated with a greater likelihood of students smoking in Oman (OR = 3.70; 95% CI: 2.25–6.11) and Kuwait (OR = 1.47; 95% CI: 1.12–1.91).

When adjusting for all covariates in the multivariable logistic regression analysis, parental monitoring was also associated with a lower likelihood of tobacco use, except for parents going over things without respondent's approval, which was associated with higher aORs of tobacco use. However, the associations were not statistically significant for some variables, as shown in Table 3. In Oman, school students whose parents went over their things without their approval were significantly more likely to use tobacco (aOR = 3.52; 95% CI: 1.88–6.59), and also in Kuwait (aOR = 1.52; 95% CI: 1.15–2.02). The Hosmer–Lemeshow goodness-of-fit test showed that multivariable logistic regression models with parental monitoring covariates were good models for tobacco use in all three countries.

Discussion

In this study, the most recent data from the nationally representative GSHSs were used to determine the prevalence of cigarette smoking and tobacco use in other forms in school students in Afghanistan, Oman and Kuwait and their association with parental monitoring activities.

In the 30 days before the survey, the lowest tobacco use was reported in Oman, followed by Afghanistan and then Kuwait. In Afghanistan 7.9% of the school students had smoked cigarettes on one or more days in the 30 days before the survey and 7.5% had used other tobacco products; overall 10.6% of the students had used tobacco in either cigarette or other forms. In Oman, 6.8% of the students had smoked cigarettes on one or more days and 6.3% had used other tobacco products; overall 9.3% had used tobacco in either cigarettes or other forms. In Kuwait, 22.0% had smoked cigarettes on one or more days and 22.2% had used other tobacco products; overall 28.8% had used tobacco in either cigarettes or other forms.

These figures clearly show a substantial overlap in the use of cigarettes and other tobacco products by students. These figures highlight the need for school-based programmes offering support to those who want to quit smoking cigarettes and the use of other tobacco products. Tobacco use in school students in Kuwait was higher than in Afghanistan and Oman combined. Taxation has been used to reduce the tobacco use epidemic, but results are inconclusive *(7)*. A recent study in Bangladesh concluded that high tax share alone may not be a good measure of effective tobacco taxation in low-income countries, especially in countries with a complex tax arrangement, relatively cheap tobacco products and a growing affordability of tobacco products, which emphasizes the need for better and targeted health promotion activities *(8)*. Although cigarette smoking has decreased in people

under 18 years in the United States of America, the rate did not change from 2017 to 2018. In addition, e-cigarette use has increased significantly in these young people in the same period *(9)*.

The GSHS asks four questions about parental monitoring of adolescents' activities in the 30 days before the survey. With the exception of parents going through adolescent's things without their permission most of the time or always, the other three monitoring activities appear to inhibit adolescents from using tobacco in any form in the three countries. It could be hypothesized that this type of control of adolescents (going through their belongings without permission) could result in rebellion in the form tobacco use. However, the cross-sectional nature of the survey does not allow cause–effect relationships to be determined. However, the association between the other three types of parental monitoring and lower tobacco use is positive and such monitoring needs to be further encouraged.

Conclusion

The proportion of adolescent school students smoking cigarettes and using tobacco in other forms in Afghanistan, Oman and especially Kuwait is disturbing and suggests the need for better school-based health education and promotion programmes in these countries. In addition, services to help support students who want to stop using tobacco need to be provided in a trusting and secure environment within schools. The association of parental monitoring and use of tobacco is interesting and further studies are needed to elucidate a casual role, if any.

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Consommation du tabac par les élèves d'Afghanistan, d'Oman et du Koweït et lien avec la surveillance parentale : analyse des données de l'enquête mondiale sur la santé des élèves en milieu scolaire

Résumé

Contexte : Les données représentatives au plan national sur le tabagisme par cigarettes chez les adolescents d'Afghanistan, d'Oman et du Koweït font défaut ; ces trois pays sont considérés respectivement comme des pays à revenu faible, intermédiaire et élevé de la Région de l'Organisation mondiale de la Santé pour la Méditerranée orientale.

Objectifs : La présente étude a examiné l'effet de la surveillance parentale sur le tabagisme des élèves adolescents d'Afghanistan, d'Oman et du Koweït.

Méthodologie : Sur la base des données des enquêtes mondiales sur la santé des élèves en milieu scolaire menées en 2014 en Afghanistan, en 2015 à Oman et au Koweït, les facteurs associés au tabagisme par cigarettes et à la consommation de tabac chez les adolescents dans les 30 jours ayant précédé les enquêtes ont fait l'objet d'une analyse. Ces facteurs incluaient : la compréhension par les parents de leurs problèmes et soucis, la connaissance par les parents de l'occupation qu'ils font de leur temps libre, le fait que leurs parents fouillent ou non dans leurs affaires sans leur consentement, et le contrôle par les parents de l'exécution des devoirs à faire à la maison. L'analyse de régression logistique a été utilisée pour déterminer le lien entre la consommation du tabac et la surveillance parentale.

Résultats : La consommation de cigarettes et/ou d'autres produits du tabac par les élèves adolescents pendant un ou plusieurs jours au cours des 30 jours ayant précédé l'enquête était de 10,6 % en Afghanistan, de 9,3 % à Oman et de 28,8 % au Koweït. Les adolescents dont les parents comprenaient les problèmes, connaissaient l'occupation qu'ils faisaient de leur temps libre et vérifiaient l'exécution des devoirs à faire à la maison étaient beaucoup moins susceptibles de consommer du tabac à ce moment-là dans les trois pays ($p < 0,05$). Les adolescents d'Oman du Koweït dont les parents fouillaient les affaires sans leur consentement étaient beaucoup plus susceptibles de consommer du tabac ($p < 0,01$).

Conclusions : La prévalence du tabagisme chez les adolescents, surtout au Koweït, met en évidence la nécessité d'améliorer l'éducation sanitaire et les programmes de promotion de la santé en milieu scolaire dans ces pays.

تعاطي التبغ بين طلاب المدارس في أفغانستان وعُمان والكويت، وارتباط ذلك بالرقابة الأبوية: تحليل البيانات من المسح العالمي لصحة طلاب المدارس

مسعود علي شيخ

الخلاصة

الخلفية: لا توجد بيانات مُعبِّرة عن الأوضاع الوطنية حول تدخين السجائر بين المراهقين في أفغانستان، وعُمان، والكويت.

الأهداف: تناولت الدراسة أثر الرقابة الأبوية على معدل تعاطي التبغ بين طلاب المدارس المراهقين في أفغانستان، وعُمان، والكويت.

طرق البحث: استُخدمت البيانات الواردة من المسوحات العالمية لصحة طلاب المدارس من أفغانستان لعام ٢٠١٤، ومن عُمان ومن الكويت لعام ٢٠١٥ في تحليل العوامل المرتبطة بتدخين السجائر وتعاطي التبغ بين المراهقين على مدار الثلاثين يوماً السابقة للمسح. وتضمنت هذه العوامل: استيعاب الآباء لمشاكل أولادهم ومخاوفهم، وعلم الآباء بكيفية قضاء أولادهم لأوقات فراغهم، وتفتيش الآباء لأغراض أولادهم دون موافقتهم،

وتحقُّق الآباء من أداء أولادهم لفروضهم المدرسية. وأُجري تحليل الانحدار اللوجستي لتقييم الارتباط بين معدلات تعاطي التبغ والرقابة الأبوية.

النتائج: بلغت نسبة تدخين السجائر و/ أو تعاطي منتجات التبغ الأخرى بين طلاب المدارس المراهقين على مدار يوم أو أكثر خلال الثلاثين يوماً السابقة للمسح ١٠,٦٪ في أفغانستان، و٩,٣٪ في عُمان، و٢٨,٨٪ في الكويت. وتبين أن احتمال تعاطي التبغ في البلدان الثلاثة يقل بدرجة ملحوظة بين المراهقين الذين كان آباؤهم يتفهمون مشاكلهم، وكانوا على علم بكيفية قضاء أولادهم لأوقات فراغهم، وكانوا يتحققون من أداء أولادهم لواجباتهم المدرسية (القيمة الاحتمالية < ٠,٠٥). بينما ارتفع ارتفاعاً كبيراً احتمال تعاطي التبغ في عُمان والكويت بين المراهقين الذين كان آباؤهم يفتشون أغراضهم دون موافقتهم (القيمة الاحتمالية < ٠,٠١).

الاستنتاجات: يدل انتشار تعاطي التبغ بين المراهقين، على الحاجة الماسة إلى برامج مدرسية أفضل لتعزيز الصحة والتثقيف الصحي في هذه البلدان، خاصة في الكويت.

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Regional consultation on novel tobacco products: health effects, research needs and provisional recommended actions for regulators[1]

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Introduction

Shifts in the tobacco market due to awareness of tobacco risks, implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) provisions (1), and tightening of regulations, have resulted in declining sales of cigarettes in high-income economies. The tobacco industry has responded by promoting so-called 'cleaner' or 'reduced risk' alternative products, including electronic nicotine delivery systems (ENDS), of which e-cigarettes are the most common type; electronic non-nicotine delivery systems (ENNDS); and other newer tobacco products such as new generation heated tobacco products (HTPs). Currently, HTPs are available in at least 40 WHO Member States and continue to spread (2). Moreover, the evolution of these products and the interchangeability of the component parts have posed a unique challenge to their monitoring, surveillance, classification and regulation (2).

The high prevalence of tobacco use, paired with increasing measures to combat the use of traditional tobacco products, could drive a market move to these newer tobacco products, which are severely under regulated in many Member States. In 2016, ENDS were banned in 30 WHO Member States globally, 11 of which were in the EMR (3).

Following an emerging trend in the EMR for the legalization of e-cigarettes, a regional consultation was called upon by Member States from the Region to give further guidance on how to deal with these new products, and was held 3–4 July 2019 at the WHO Regional Office for the Eastern Mediterranean Region, Cairo, Egypt.

The objectives of the consultation were to:

- review the global and regional status of regulation on e-cigarettes and newer tobacco products
- examine best practice regulation on regulating e-cigarettes and newer tobacco products
- review and develop recommendations for EMR Member States on how to regulate e-cigarettes and newer tobacco products.

This consultation was attended by nearly 30 participants including international and regional experts in addition to Member States' representatives. The consultation served as a platform for sharing recommendations for regulation of ENDS, ENNDS, and HTPs. Two side-by-side texts (one for ENDS/ENNDS and one for HTPs) were finalized during the consultation and are to be included in its final report. The findings of the regional consultation and the side-by-side texts will be the basis of a WHO global consultation to be held in early 2020.

The consultation addressed the following topics: the overarching scientific evidence on ENDS, ENNDS and HTPs and their prevalence in the Region; global recommendations (WHO FCTC/WHO) on ENDS and HTPs and the relevant Articles of the WHO FCTC; ENDS taxation; policy considerations and approaches towards regulating ENDS and HTPs (with a focus on protecting users and non-users and preventing unproven health claims); European perspectives on policies to control ENDS and HTPs; preventing youth initiation; protecting tobacco control policies from vested interests; Illicit tobacco trade in ENDS/ENNDS and HTPs; flavour regulation in the EU; and Member States' experiences in establishing strong policies to control ENDS and HTPs.

Summary of discussions

The work of the consultants and the Member States sought agreement on the elements of the side-by-side text for implementation of the WHO FCTC on ENDS and ENNDS; and the elements of the side-by-side text for implementation of the WHO FCTC on HTPs. During the consultation experts, Member States, and representatives from WHO Regional Office for the eastern Mediterranean Region, WHO FCTC and WHO HQ were divided into working groups based on their expertise. These groups developed side-by-side texts based on WHO FCTC and Conference of the Parties (COP) decisions, and provided options to Member States for regulations based on international best practices.

Recommendations to Member States

- Banning either ENDS and ENNDs products until further evidence is available or regulate these products.

[1] This report is based on the proceedings of the Regional consultation on novel tobacco products: ENDS, ENNDS and HTPs. Health effects, research needs and provisional recommended actions for regulators, 3–4 July 2019, Cairo, Egypt.

- Regulating ENDS and ENNDS, if a Member State chooses to do so, using COP and WHO recommendations.

For HTPs, given COP decisions and WHO recommendations, Member States are called upon to regulate them as a tobacco products.

The side-by-side texts included in the report for the consultation contain regulatory options based on COP decisions, WHO recommendations and international best practices for ENDS, ENNDS and HTPs.

Recommendations to WHO

- continuing its support to Member States for implementing effective control policies for the use of ENDS, ENNDS and HTPs.
- continuing supporting Parties to the WHO FCTC to fulfil their obligations under the treaty with respect to ENDS, ENNDS and HTPs.

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Regional framework for action on tobacco control

World Health Organization
REGIONAL OFFICE FOR THE Eastern Mediterranean

Strategic intervention	Progress indicator	Relevant WHO Framework Convention on Tobacco Control (FCTC) article
Governance and political commitment		
→ Become a Party to the WHO FCTC → Develop national tobacco control strategies, plans and programmes aligned with the WHO FCTC → Assign a full-time focal point for tobacco control → Adopt measures to protect public health policies from the influence of the tobacco industry → Ensure the sustainability of tobacco control programmes	→ A comprehensive national tobacco control law is in place, in line with WHO FCTC commitments → Comprehensive, multisectoral national tobacco control strategies, plans and programmes, consistent with the WHO FCTC, are enacted → A designated national multisectoral coordinating mechanism for tobacco control is in place → A tobacco control focal point is in place → Measures to address Article 5.3 of the WHO FCTC are included in national tobacco control plans → Funding is available in the ministry of health budget for tobacco control programmes	Article 5
Demand reduction		
→ Increase tobacco taxes to at least 75% of the retail price, and include all tobacco products in tax increases → Expand current smoke-free policies to cover all public places and workplaces → Establish a complete ban on tobacco advertising, promotion and sponsorship, including a ban on tobacco promotion in drama → Enforce graphic health warnings at least 50% of the pack size on all tobacco products and packaging in line with WHO FCTC guidelines → Incorporate delivery of brief cessation advice into essential services package for primary health care, including	→ Tobacco tax is at least 75% of retail price for all tobacco products, through using excise tax → All public places and workplaces are totally smoke-free with no designated smoking areas → All forms of tobacco advertising, promotion or sponsorship are banned → All tobacco products have graphic health warnings at least 50% of pack size → Brief tobacco cessation advice is integrated into primary health care, health promotion, risk reduction and disease control programmes. Primary health care workers are trained in brief tobacco cessation advice. Quit line is established	Articles 6–14

(continued) ↘

Regional framework for action on tobacco control *(continued)*

Strategic intervention	Progress indicator	Relevant WHO Framework Convention on Tobacco Control (FCTC) article
Demand reduction		
establishment of quit line, and ensure availability of nicotine replacement therapy and mandate training of all health professionals in giving brief cessation advice		
Supply restriction		
→ For Member States that are Parties to the WHO FCTC, pursue ratification of the Protocol to Eliminate Illicit Trade in Tobacco Products → Adopt measures to minimize illicit trade in tobacco products → Ban tobacco sales to and by minors → Transition tobacco farmers towards other crops → Eliminate incentives for tobacco agriculture	→ The number of WHO FCTC Parties that have ratified the Protocol to Eliminate Illicit Trade in Tobacco Products has increased to nine → Tracking and tracing system of tobacco products is in place → Legislation banning sales of tobacco products to and by minors is enacted in all Member States → Policies and programmes to reduce tobacco agriculture are being established	Articles 15–17
Surveillance, monitoring and research		
→ Regularly implement standard global/regional surveys (e.g. Global Tobacco Surveillance System surveys) and evaluation on tobacco control activities and disseminate results widely → Institute research to monitor tobacco industry efforts to circumvent tobacco control in the Region	→ National adult and youth surveys are regularly conducted, every 5 years → Tobacco industry monitoring and research is actively being implemented in the Region	Article 20 and part of Article 5

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