

Original investigation

# Tobacco-Related Education in Schools of Pharmacy in the Middle East: A Multinational Cross-Sectional Study

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## Abstract

**Background:** Lack of adequate tobacco-related content in pharmacy curricula can interfere with pharmacist's ability to provide tobacco cessation interventions. This study aims to determine the extent of tobacco-related content in pharmacy schools' curricula across the Middle East region, instructional methods used, perceived adequacy and importance of tobacco education, and barriers for inclusion of tobacco-related content in pharmacy curricula.

**Methods:** A web-based survey was sent to 120 schools of pharmacy in 13 Middle Eastern countries. Key faculty members were identified and sent an e-mail with an online link to the survey. Data were descriptively analyzed using Statistical Package for Social Sciences version 22.

**Results:** Of the 120 pharmacy schools contacted, 59 schools completed the survey (49.2% response rate). Of this, 44 (74.6%) reported including tobacco-related content in their undergraduate curricula. Nicotine pharmacology and principles of addiction (64.4%), pharmacologic aids for tobacco cessation (61%), and health effects of tobacco (61%) were the most commonly reported topics. The topics that were least perceived to be adequately covered were monitoring outcomes of tobacco cessation interventions (5.9%) and epidemiology of tobacco use (15.4%). The top barriers to inclusion of tobacco-related topics in the curriculum were lack of time (75.9%), lack of experiential training sites focusing on tobacco cessation interventions (72.2%), lack of faculty expertise (66%), and perceived lack of priority of tobacco related content in pharmacy schools (66%).

**Conclusions:** The current findings suggest that more efforts should be geared towards increasing content for tobacco education in schools of pharmacy across the Middle East and towards overcoming the identified barriers.

**Implications:** This study is the first to assess the extent of tobacco-related content in pharmacy schools curricula across the Middle East countries. If pharmacy students are expected to deliver effective tobacco cessation services when they graduate as pharmacists, then schools of pharmacy in the Middle East should consider providing adequate tobacco-related content and training in undergraduate curricula. Pharmacy schools have to work on circumventing the identified

barriers including lack of time, lack of experiential training sites offering tobacco cessation interventions, shortage of faculty with relevant expertise and placing low priority on tobacco education in pharmacy schools.

## Introduction

Tobacco use is a major burden in the Eastern Mediterranean region with 36.2% of male adults (15 years and older) in 2012 and 21.3% of male adolescents (13–15 years) from 2007 to 2014 using tobacco.<sup>1</sup> The region has the highest growth rate in the cigarette market with over one-third increase in cigarette consumption in the last 16 years.<sup>2</sup> In addition, tobacco attributable diseases are also prevalent in the Middle East and North Africa (MENA) region. For instance, in 2013, ischemic heart disease and chronic obstructive pulmonary disease (COPD) have been among the top ten causes of years of life lost in this region.<sup>3</sup> In response to the increasing tobacco epidemic, many countries in the region have implemented different tobacco control intervention programs as outlined in the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) and in MPOWER measures. Despite these interventions, tobacco use prevalence is still on the rise and greater efforts to control this public health burden are needed.<sup>4</sup>

Tobacco cessation intervention is key for reducing the risk of developing and dying from tobacco-related diseases.<sup>5</sup> Although many tobacco users make unaided quit attempts, only a few remain abstinent a year later.<sup>6</sup> Evidence confirms that counseling from a healthcare provider can increase success in quitting tobacco use.<sup>7–8</sup> Pharmacists are considered the most accessible healthcare providers and most tobacco cessation aids are available over-the-counter in community pharmacies in many countries.<sup>8</sup> This places pharmacists in a unique position to initiate addiction behavior changes among tobacco users within the community.<sup>9</sup> Many studies have demonstrated that pharmacists can offer effective tobacco cessation interventions and can help improve tobacco abstinence rates.<sup>10</sup> Research evidence suggests that healthcare providers, including pharmacists, who received smoking cessation training are more likely to effectively intervene with smokers than those who did not.<sup>11</sup> Tobacco-related clinical practice guidelines highly recommend that all healthcare providers and students in health professions should receive comprehensive training to implement effective tobacco cessation interventions and that health professional institutions should integrate tobacco cessation education in their curricula.<sup>7,12</sup> Moreover, the WHO code of practice on tobacco control stresses the importance of including tobacco control in the curricula of health institutions and education centers.<sup>13</sup>

In tandem with this, the role of pharmacy academia in supporting tobacco control has been increasingly recognized and studies have shown that pharmacy students who receive tobacco cessation training have better perceived roles and abilities for providing tobacco cessation counseling to patients compared with students who did not receive such training.<sup>14–17</sup> Some studies have assessed tobacco-related content in pharmacy schools' curricula in different countries.<sup>18–20</sup> Hudmon et al. evaluated the extent of tobacco-related education in 83 schools of pharmacy in the United States.<sup>18</sup> A similar study aimed at determining the extent of smoking cessation education in 12 schools of pharmacy was conducted in Thailand.<sup>19</sup> However, the extent of tobacco-related education in pharmacy schools curricula in the Middle East (ME) region has not been previously assessed.

Undoubtedly, there is a clear need to ensure that pharmacy graduates in the ME are receiving adequate training in tobacco control.

This study aimed to: (1) assess the extent of tobacco-related content in the curricula of ME schools of pharmacy; (2) determine the educational methods of instruction for tobacco-related content; (3) assess the perceived adequacy with which tobacco-related topics are being addressed in the curricula and; (4) identify the key barriers against the inclusion of tobacco-related topics in the curricula of ME schools of pharmacy.

## Methods

### Study Design

This was a multinational cross-sectional web-based survey that was conducted among pharmacy faculty members in the ME schools of pharmacy who were involved in teaching tobacco-related content, planned to have such content, or have an insight of such content. The 13 ME countries involved in the study were: Egypt, Iraq, Jordan, Kingdom of Saudi Arabia (KSA), Kuwait, Lebanon, Oman, Palestine, Qatar, Sudan, Syria, United Arab Emirates (UAE), and Yemen.

### Population and Sampling

This study targeted all schools and colleges of pharmacy in 13 Middle Eastern countries. A total of 120 schools of pharmacy across these countries were included. One faculty member (in the capacity of institutional informant) was targeted to respond to the survey from each pharmacy school as our aim was to make an inventory of tobacco-related education in pharmacy curricula within the region. Therefore, we used universal purposive sampling and no sample size was determined for this study.

### Survey Implementation and Data Collection Procedures

We created an electronic database that included the names and contact details of all Deans and occasionally Departmental Chairs of all pharmacy schools and colleges in the 13 Middle Eastern countries. All Deans and/or Pharmacy Practice Department Chairs of the identified schools of pharmacy were initially contacted through an e-mail to identify faculty members who were teaching tobacco-related courses at their respective pharmacy schools or coordinating courses with such content or interested in such content. Those who did not respond to the invitation were sent weekly reminders at least three times. Follow-up telephone calls were made to those who had not responded after 6 weeks. In addition, snow-balling method was used to identify appropriate faculty members for schools whose Deans or Department Chairs had not responded or could not be reached through telephone. It is worthwhile to note that several countries including Syria, Yemen, Iraq, and Palestine were in political turmoil, making communication and data collection highly laborious and challenging. E-mails were sent to all identified faculty members with an online link to the survey on SurveyMonkey (SurveyMonkey Inc., Palo Alto, CA). In order to increase the response rate, a weekly reminder was sent to non-responders four times after the initial e-mail.

Although the initial plan was to include only one faculty member for each school of pharmacy, we received two or more responses from a few schools. Given the practical challenges of collapsing the responses and the fact that the majority of the schools (52 of 59 schools) had only one respondent, the investigators felt that it would be more appropriate to include one respondent from each school. The selection of one respondent from each school with two or more respondents was achieved through consensus by the investigators with consideration to the quality and comprehensiveness of the reported data.

### Instrument Development and Validation

A 33-item survey instrument comprising of a combination of close-and open-ended questions was developed. Specifically, similar surveys conducted in the United States, Thailand, and Canada about tobacco teaching in pharmacy served as guidance for developing the survey instrument.<sup>18-20</sup> The instrument was developed through an iterative process among the investigators. To ensure content validity of the developed instrument, the first draft was reviewed by two faculty members with expertise and experience in tobacco research using survey instruments. The appropriateness, comprehensiveness, ease of readability, and completion time of the survey items were determined through a pilot-testing among three faculty members.

The final survey contained five sections: (1) socio-demographic and smoking-related personal characteristics (14 items); (2) extent of tobacco-related topics in pharmacy curriculum (5 items); (3) methods of delivery of tobacco-related topics (8 items); (4) perceived importance of tobacco-related topics (4 items) and; (5) perceived barriers of including tobacco-related education in the pharmacy curricula (1 item). The survey is available as a Supplementary file.

### Ethical Approval

The study was approved by the Qatar University Institutional Review Board (QU IRB).

### Statistical Analysis

Data collected were analyzed using Statistical Package for Social Sciences, version 22 (IBM SPSS Statistics for Windows; IBM Corp,

Armonk, NY). Frequencies and percentages were used to summarize most of the responses generated. In addition, median (IQR) and range were used as appropriate for the time devoted for teaching tobacco-related topics.

## Results

### Survey Response Rate and Sociodemographic Characteristics of Respondents

Thirteen ME countries including five Gulf Cooperation Council (GCC) states were involved in this multinational regional study (Table 1). Of 120 schools of pharmacy in the ME targeted by the study, 59 schools returned completed surveys (49.2 % response rate). The majority of the respondents (78%) were male, aged between 30 and 49 years (72.9%), and had never been smokers (65.5%). Most respondents (71.2%) have been taught tobacco-related topics during their study period. However, only 13.8% of the respondents had received formal tobacco-related training.

### Pharmacy Schools' Characteristics and Tobacco-Related Education

There was some form of tobacco-related content in the undergraduate curricula of 44 out of the 59 pharmacy schools (74.6%). All pharmacy schools that responded to the survey in Qatar, Kuwait, Jordan, Oman, and Lebanon included tobacco-related education in their curricula. Overall, the average class size was 70 students ( $SD = 72.3$ , range = 15–400). Almost half of the schools (49.2%) offered continuous education (CE) or continuing professional development (CPD) programs for practicing pharmacists of which 34.5% reported offering CE or CPD programs specific to tobacco. Tobacco-related topics were mostly taught in pharmacology (42.4%), pharmacotherapy (28.8%), pharmacognosy (20.3%), and toxicology and drugs of abuse (16.9%) courses. Tobacco education was typically delivered as a required course or part of a required course as reported by 69.5% of the schools.

**Table 1.** Study Response Rate Per Country and Percentage of Pharmacy Schools in the Middle East That Include Tobacco Related Contents in Their Undergraduate Curricula

Country	Number of pharmacy schools in the country	Number of contacted pharmacy schools	Number (% <sup>a</sup> ) of pharmacy schools that participated in the study	Number (% <sup>b</sup> ) of pharmacy schools that include tobacco-related topics in their undergraduate curricula
Qatar	1	1	1 (100)	1 (100)
KSA <sup>c</sup>	20	20	12 (60)	6 (50)
UAE	7	7	5 (71.4)	4 (80)
Kuwait	1	1	1 (100)	1 (100)
Egypt	27	27	8 (29.6)	6 (75)
Sudan	12	12	4 (33.3)	2 (50)
Oman	2	2	2 (100)	2 (100)
Lebanon	5	5	5 (100)	5 (100)
Jordan	10	10	6 (60)	6 (100)
Syria	9	9	2 (22.2)	0 (0)
Palestine	5	5	3 (60)	3 (100)
Yemen	5	5	3 (60)	2 (66.7)
Iraq	16	16	7 (43.8)	6 (85.7)
Total	120	120 (100%)	59 (49.2%)	44 (74.6%)

<sup>a</sup>Percentage was computed out of the number of pharmacy schools that were contacted.

<sup>b</sup>Percentage was computed out of the number of pharmacy schools that responded to the survey.

<sup>c</sup>Kingdom of Saudi Arabia.

### Extent of Tobacco-Related Content and Perceived Adequacy of Coverage in Undergraduate Pharmacy Curricula

The median total time spent on tobacco education was 185 minutes (interquartile range 81–570 minutes) (Table 2). The topics that were reported to be covered by the majority of the schools that responded were nicotine pharmacology and principles of addiction (64.4%), pharmacologic aids for tobacco cessation (61%), and health effects and/or the pathophysiology of tobacco-related diseases (61%).

The highest median times in minutes dedicated to tobacco education were also reported for the same topics. Less than 35% of the participants perceived that all topics were adequately covered. The topics that were least perceived to be adequately covered were methods for monitoring outcomes of tobacco cessation interventions (5.9%), epidemiology of tobacco use (15.4%), tobacco use, prevention, and/or methods of quitting in special populations (15.8%), and the transtheoretical model of change (15.8%). When asked about any plans to add more tobacco-related contents in their curricula, 52.3% of

**Table 2.** Extent of Tobacco-Related Content and Perceived Adequacy of Coverage in Undergraduate Pharmacy Curricula in the Middle East

Topic	Time allocated (Median [M] IQR and range in minutes)	Proportion of schools including the topic in the curriculum (percent)	Proportion of schools perceiving the topic to be adequately covered (percent <sup>a</sup> )
Epidemiology of tobacco use	M = 10 IQR = 4.8–30 Range = 0–120	31/59 (52.5)	4/26 (15.4)
Forms of tobacco	M = 7.5 IQR = 4.8–20 Range = 0–120	32/59 (54.2)	5/23 (21.7)
The health effects and/or the pathophysiology of tobacco-related diseases	M = 20 IQR = 10–80 Range = 0–600	36/59 (61)	8/31 (25.8)
The health benefits of tobacco cessation	M = 10 IQR = 5–45 Range = 0–600	34/59 (57.6)	7/25 (28)
Nicotine pharmacology, principles of addiction	M = 20 IQR = 10–90 Range = 0–240	38/59 (64.4)	9/27 (33.3)
Drug interactions with tobacco	M = 10 IQR = 5–45 Range = 0–120	31/59 (52.5)	6/23 (26.1)
The 5A's (Ask, Advice, Assess, Assist, Arrange follow-up) strategy for tobacco cessation intervention	M = 10 IQR = 3–30 Range = 0–300	25/59 (42.4)	4/22 (18.2)
Transtheoretical model of change (TTM)	M = 2 IQR = 0–12.5 Range = 0–60	16/59 (27.1)	3/19 (15.8)
Pharmacologic aids for tobacco cessation	M = 30 IQR = 10–60 Range = 0–240	36/59 (61)	8/25 (32)
Non-pharmacologic methods for tobacco cessation	M = 10 IQR = 4.5–33.8 Range = 0–240	26/59 (44.1)	4/23 (17.4)
Counseling patients regarding the use of NRT and other smoking cessation aids	M = 10 IQR = 5–42.5 Range = 0–240	27/59 (45.8)	5/22 (22.7)
Tobacco use, prevention, and/or methods of quitting in special populations	M = 5 IQR = 0–15 Range = 0–120	19/59 (32.2)	3/19 (15.8)
National or international guidelines for smoking cessation	M = 5 IQR = 0–22.5 Range = 0–240	19/59 (32.2)	3/16 (18.8)
Methods for monitoring outcomes of tobacco cessation interventions	M = 1.5 IQR = 0–13.8 Range = 0–120	15/59 (25.4)	1/17 (5.9)
Different approaches to smoking cessation intervention	M = 2 IQR = 0–10 Range = 0–360	16/59 (27.1)	3/18 (16.7)
Total	M = 185 IQR = 81–570 Range = 26–2420		

<sup>a</sup>Percentage has been computed out of the total number of respondents who answered the question.

the respondents indicated that they were not sure, 31.8% answered that they had plans to add more tobacco-related topics in their curricula, while 15.9% had no plans.

### Methods Used in Teaching Tobacco-Related Topics

Various teaching methods were reported to be used with didactic lectures being the most frequently used approach (90.2%), followed by case studies and other problem-solving exercises (56.1%), seminars (31.7%), and group discussions (29.3%). Methods involving independent study or standardized/simulated patients' role plays were the least used (14.6% and 7.3%, respectively). Interventions with tobacco users during experiential training (clerkships or clinical rotations) were used by 24.4% of the schools. Instructor handouts, readings from textbooks and/or other scholarly sources, journal articles and clinical practice guidelines were used for teaching and learning by 73.2%, 75%, and 72.5% of the schools respectively. Only 10% of the schools used hands-on training in smoking cessation clinics for teaching students. The majority of the schools (73.2%) assessed students on tobacco-related topics with written assessments being the most commonly reported method of assessment (90%). The Objective Structured Clinical Examination (OSCE) was used by 30% of the schools as a method of assessment.

### Perceived Importance of Tobacco-Related Topics in Pharmacy Curriculum

In general, almost all of the participants (98.2%) considered including tobacco-related topics in the pharmacy curriculum as important. In addition, the majority (94.6%) rated including tobacco-related topics as core part of the pharmacy curriculum as important. Furthermore, 89.1% perceived implementing CE or CPD programs on tobacco education for practicing pharmacists as important. All topics were considered important for inclusion in the curriculum by more than 78% of the schools. The top four topics perceived as important were: nicotine pharmacology and principles of addiction (98.2%), the health effects of tobacco-related disease (98.2%), the health benefits of tobacco cessation (96.3%), and pharmacologic aids for tobacco cessation (94.6%).

### Perceived Barriers Against the Inclusion of Tobacco-Related Topics in Pharmacy Curriculum

Of the 11 possible barriers against the inclusion of tobacco-related content in pharmacy curricula, lack of time, lack of experiential training sites that focus primarily on tobacco cessation interventions, perceived lack of priority of tobacco-related content in pharmacy schools, and lack of faculty with expertise in smoking cessation were rated as important barriers by 75.9%, 72.2%, 66% and 66% of the respondents, respectively. On the other hand, the barriers that were considered least important were lack of financial resources, and receiving funding from tobacco companies or their subsidiaries (40.7% and 22.2%, respectively).

### Discussion

Among schools of pharmacy where tobacco-related contents were taught to undergraduate students, there was diversity in the topics covered and in the courses incorporating such topics. Tobacco-related contents were relatively more commonly covered within courses with clinical nature (eg, therapeutics) than within courses related to public health or general pharmacy practice. In general, tobacco-related

contents are less commonly taught in the curricula of schools of pharmacy in the ME when compared to those in the Western world (eg, the United States) and Southeast Asia (eg, Thailand).<sup>18,19</sup> There is no topic that was covered by all or the majority of the schools of pharmacy in the ME region. However, the topic that was most commonly covered is nicotine pharmacology and principles of addiction. Other topics were covered by 25.4%–61% of the schools, a rate that is relatively lower than that in the US schools of pharmacy.<sup>18</sup> In the United States, there was more consistent coverage with more than five topics shared among at least 90% of the schools of pharmacy. However, the time dedicated to teaching various tobacco-related topics in the present study (median duration of 185 minutes) is comparable to that devoted in the United States and the Thai schools of pharmacy.<sup>18,19</sup> With the wide scope of tobacco-related content and the challenge of counseling for tobacco dependence, at least 6 hours of training are recommended to understand the 5A's approach to counseling, including activities that enhance self-efficacy for counseling, such as role playing, interactions with virtual patients, and/or standardized patients and OSCE assessments.<sup>14</sup> This implies that the schools of pharmacy in the region and elsewhere<sup>18,19</sup> fell short of the recommended dedicated time for teaching tobacco-related content in healthcare curricula.

In the present study, didactic lectures, case studies, and other problem-solving exercises were the most common teaching methods used for tobacco-related subjects, whereas interactive teaching strategies were the least commonly used. The use of role plays and patients scenarios which incorporated treatment guidelines, the 5A's counseling process, and the transtheoretical model have been found to facilitate pharmacists' skills development for smoking cessation.<sup>21</sup> In the area of continuing pharmacy education on reproductive health, interactive workshops resulted in better knowledge retention than didactic lectures, although the overall knowledge scores were higher for didactic lectures.<sup>22</sup> This may suggest that using a blended approach to teach health-related issues may result in greater outcomes. A study from Kuwait suggested that a 4-hour teaching module which included 2 hours of didactic lecturing and 2 hours of interactive workshop can improve students' preparedness for providing tobacco cessation counseling.<sup>23</sup>

The reliance on the didactic lectures found in the present study is consistent with the study finding that respondents rated the topics that are more theoretical in nature such as nicotine pharmacology and principles of addiction and the health effects of tobacco-related diseases to be more important than the topics that are having more practical nature and those requiring interaction with smokers such as patient counseling regarding smoking cessation aids, methods for monitoring outcomes of tobacco cessation, and the different approaches to smoking cessation intervention. The later topics prepare future pharmacists to play more active roles in assisting tobacco users with quitting. In the United States, pharmacy educators made more emphasis on aids for cessation and assisting patients with quitting.<sup>18</sup> A majority of newly graduated pharmacists indicated the importance of incorporating motivational interviewing into pharmacy curricula.<sup>24</sup>

The present study revealed that the two most commonly perceived barriers against the inclusion of tobacco-related topics in pharmacy curriculum were lack of time in the curriculum and lack of available experiential training sites that primarily offer tobacco cessation interventions. Such finding is comparable with the findings from other countries.<sup>18–20</sup>

Globally, there is a similarity in the nature of tobacco-related topics covered by pharmacy, medical, and nursing schools; an attribute

that is overall positive because of the need to have a universally harmonized tobacco control curriculum that can be taught across healthcare professional education institutions. In a worldwide survey of medical schools, the most common topics taught were health effects of smoking, health effects of passive smoking, epidemiology of tobacco use, nicotine dependence, and smoking history taking.<sup>25</sup> In a study evaluating tobacco-related contents in the curricula of nursing schools in four Asian nations, the most commonly covered topics were health risks from smoking, health effects of tobacco use, effects of passive smoking, contents of cigarette smoke, the 5A's strategy, symptoms of withdrawal, high risk groups, and pharmacologic treatment.<sup>26</sup> Tobacco-related topics can be taught to undergraduates from various healthcare professional institutions including pharmacy through interprofessional education sessions.<sup>27-29</sup>

The Middle Eastern countries witness dramatic increases in the use of tobacco in all of its different types and forms, especially among youth and young adults.<sup>2</sup> In some countries, smoking rates among medical students reached around 20%, while it ranged between 10% and 15% among pharmacy students.<sup>30-32</sup> At the same time, tobacco control efforts are not up-to the expected level in terms of comprehensiveness and effectiveness compared to the other regions of the world.<sup>33-34</sup> Regional and national tobacco control efforts initiated by healthcare professionals including pharmacists as part of professional practice are not well established in the ME. To our knowledge, there is no multi-country study in the ME evaluating these efforts among pharmacists as part of their routine activities, but usually the nature of pharmacy practice in any particular ME country mirrors the other countries in the region. El Hajj et al. assessed smoking cessation counseling practice among community pharmacists in Qatar.<sup>35</sup> The investigators found that only one fifth of the respondents play an active role in this regard. In this context, empowering healthcare professionals to fight the tobacco epidemic is essential and the starting point should be the inclusion of well-designed tobacco control contents in the curricula of health professional institutions across all of the Middle Eastern countries.

This is the first study to evaluate tobacco-related education in schools of pharmacy in the ME. The study findings will serve as a benchmark against which future parallel assessments will be compared in order to estimate changes in curricula contents as a result of any program dissemination. While all the schools of pharmacy in the region have been the target of the study, only 49.2% responded. However, this response rate is not as low as it may seem to the reader on the first impression, because the target of the study was the whole population and those who responded represent a representative sample of the universe from which we are drawing conclusions. Furthermore, because the majority of the respondents were themselves responsible for the delivery of tobacco education at their schools, we believe this lends additional credibility to the study results. A possible explanation of the overall low response in the study was the low response from countries experiencing political turmoil such as Syria, Yemen, Iraq, and Palestine. As with all survey type research, the findings are prone to social desirability bias. Therefore, findings such as tobacco-use history of the respondents and perceived importance of tobacco-related topics and pharmacists' role should be interpreted with caution.

The following set of recommendations would allow all pharmacy students to receive a comprehensive training for assisting patients with quitting:

- o Faculty members need to consider integrating a comprehensive, evidence-based tobacco education component and cessation training within the curricula of pharmacy schools.
- o Faculty members responsible for teaching tobacco-related topics need to communicate, collaborate, and act for unifying at least the important aspects of tobacco-related content among schools toward the common goal of enhancing patient care and improving health outcomes.
- o There is a need to build the capacity of the faculty members responsible for teaching tobacco-related topics by conducting special training or setting special requirements such as having certain credentials or certifications.

## Conclusion

This study revealed a clear agreement among responding pharmacy schools on the importance of including tobacco-related topics in the curricula of pharmacy schools in the ME. There seems to be a need to adopt a more diverse teaching and learning strategies that utilize practical training on aspects that improve students' skills for helping tobacco users in quitting. Although the respondents generally perceived tobacco-related education in pharmacy to be important, they nevertheless identified lack of time and focused experiential training sites as key barriers to inclusion of tobacco-related content. Finally, there seems to be a need to have a harmonized tobacco control curriculum that helps in graduating pharmacists with the right set of skills and competencies to confront the tobacco smoking epidemic in the region.

## Supplementary Material

Supplementary data are available at *Nicotine & Tobacco Research* online.

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## Declaration of Interests

None declared.

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