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Improving Pharmacists' Competence in Smoking Cessation: Evaluation of an Intensive Tobacco Control Education Program Using OSCE

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Abstract

Tobacco consumption continues to be a critical global public health issue. Due to their widespread accessibility, community pharmacists are well-positioned to provide tobacco cessation support. To equip pharmacists in Qatar with the necessary knowledge and practical skills for delivering smoking cessation interventions, a comprehensive tobacco control education program was developed and implemented. This study aimed to evaluate how this program influenced pharmacists' competencies and practical abilities. A random selection of community pharmacists in Qatar was invited to participate. Those who agreed were randomly allocated to either an intervention or a control group. The intervention group received a detailed training program on managing tobacco-use disorder, while the control group attended a brief lecture on a topic unrelated to tobacco. The effectiveness of the program was measured using an Objective Structured Clinical Examination (OSCE) to assess tobacco cessation skills and competencies. Fifty-four pharmacists in the intervention group and thirty-two in the control group completed the OSCE. Across all cases, the intervention group achieved substantially higher scores than the control group. The mean total scores for the six OSCE cases were 15.2, 15.3, 14.2, 14.6, 16.3, and 15.2 for the intervention group, versus 8.8, 6.2, 7.7, 9.2, 8.3, and 11.3 for the control group ($p < 0.001$).The findings indicate that a targeted, intensive tobacco cessation education program can significantly enhance community pharmacists' counseling skills and overall competence in supporting patients to quit smoking.

Keywords: Qatar, Education program, Tobacco control, Smoking cessation, Pharmacist, OSCE

Introduction

Globally, there are approximately 942 million men and 175 million women aged 15 years or older who smoke cigarettes [1]. Roughly three-quarters of male daily smokers live in countries with medium or high Human Development Index (HDI), while about half of female daily smokers reside in very high-HDI countries [1]. In Qatar, 18.2% of adults use tobacco [2]. While smoking prevalence among men in Qatar is lower than the average in very high-HDI nations, there are still over 260,000 male daily smokers, representing a considerable public health challenge [2]. Consequently, it is essential for healthcare providers in Qatar to deliver tobacco cessation services to increase quitting rates and prevent tobacco initiation.

Community pharmacists are accessible healthcare professionals capable of implementing the 5A's approach—ask, advise, assess, assist, and arrange follow-up—for tobacco cessation. Research demonstrates that counseling and medication recommendations provided by pharmacists result in quit rates comparable to those achieved by other healthcare providers [3]. Pharmacists also offer a cost-effective pathway to smoking cessation therapy [4]. Despite this, studies reveal that Qatari community pharmacists are minimally engaged in

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tobacco cessation initiatives, with over 80% reporting no prior formal training in this area [5].

To address this gap, a structured tobacco education program was developed to provide pharmacists with the required knowledge and competencies. This randomized controlled study aimed to design, implement, and evaluate an intensive tobacco-use treatment education program in Qatar, delivered by a team of healthcare educators. Program outcomes were measured through multiple-choice knowledge assessments and an Objective Structured Clinical Examination (OSCE).

OSCE is a widely recognized performance-based evaluation method in health professions education [6-10]. Many undergraduate programs integrate OSCEs, and in some countries, they are also used for professional licensure. OSCEs consist of several timed stations, each presenting a scenario or task that evaluates specific clinical skills, such as taking medication histories, counseling patients, or providing drug information [6-10]. Stations may be active (interactive or non-interactive) or inactive (e.g., rest stations). Interactive stations typically involve standardized patients who simulate real clinical situations. Candidate performance is assessed using standardized scoring rubrics, while non-interactive stations may involve preparation or problem-solving without immediate evaluation [6-10].

OSCEs assess a combination of cognitive, communication, interpersonal, and problem-solving skills. They can also evaluate ethical and professional judgment when carefully designed [6-10]. This study reports the OSCE outcomes used to determine the effectiveness of the intensive tobacco education program for community pharmacists in Qatar.

Materials and Methods

Study design

This investigation was conducted as a randomized controlled trial (RCT) to examine the impact of a tobacco cessation education program on community pharmacists, assessed through an Objective Structured Clinical Examination (OSCE). Participants were randomly allocated to one of two groups: an intervention group receiving comprehensive training on tobacco-use disorder management, and a control group receiving standard didactic instruction on topics unrelated to tobacco. The OSCE included six stations, each evaluating essential evidence-based competencies in tobacco cessation. A detailed description of the study methodology can be found in the published protocol [11]. The trial is registered at ClinicalTrials.gov (NCT03518476; registration date: May 8, 2018) (https://clinicaltrials.gov/ct2/show/NCT03518476).

Participant eligibility and recruitment

Pharmacists holding an active license and practicing in a community pharmacy in Qatar were eligible. Trainee pharmacists, interns, and unlicensed individuals were excluded. A total of 529 pharmacists were randomly selected from a master list of 1,000 registered community pharmacists, provided by the Health Practitioners Registration and Licensing Section, Qatar Ministry of Public Health.

Consenting pharmacists were randomly assigned to either the intervention or control group using permuted block randomization with block sizes of 2, 4, or 6. Randomization was performed by a statistician not involved in recruitment, with allocation concealed from research assistants. Due to the nature of the intervention, blinding participants to group assignment was not feasible. Participants received no incentives aside from continuing education (CE) units.

Sample size calculation

The study was powered to detect an effect size of 0.60 for continuous outcomes (skills scales) with 80% power and a significance level of 2.5%, requiring 54 participants per group. For dichotomous outcomes, this sample size allowed detection of at least a 27.5% difference between groups with 80% power and a 5% significance level. Accounting for a potential 10% dropout, the target enrollment was 60 participants per group, totaling 120 pharmacists.

Intervention group

The intervention consisted of a four-day intensive tobacco cessation education program at Qatar University, averaging eight hours per day, totaling roughly 32 contact hours. The curriculum, developed specifically for this program, was based on the ATTUD Core Competencies for Evidence-based Treatment of Tobacco Dependence [12] and accredited for 26.5 CE units by the Qatar Council for Healthcare Practitioners (QCHP).

The program addressed the following topics:

1. Tobacco-use epidemiology in Qatar and worldwide
2. Health consequences and risks of tobacco use
3. Benefits of quitting

4. Principles of nicotine dependence
5. Non-pharmacological interventions
6. Pharmacological management
7. Alternative therapies
8. Counseling and communication strategies
9. Strategies to prevent relapse
10. Management of tobacco use in special populations
11. Waterpipe dependence treatment
12. Pharmacist roles in tobacco cessation
13. Developing a tobacco cessation service
14. Professional development in tobacco cessation
15. Legal and ethical aspects relevant to Qatar

The curriculum employed both traditional lectures and active learning methods, including problem-based learning (PBL) exercises, case scenarios, group discussions, role-playing, educational games, videos, simulated exercises with peers and standardized patients, and performance feedback with debriefing.

Control group

Pharmacists in the control group attended a lecture on women's health and contraception. This content was chosen to avoid any contamination of tobacco-related knowledge or skills, ensuring that the control condition reflected standard practice. Three CE units were awarded by QCHP.

Outcome measures

The primary outcome was participants' tobacco cessation competencies, assessed through the six-station OSCE following program completion.

OSCE Design and implementation

A six-station Objective Structured Clinical Examination (OSCE) was used to evaluate the competencies and skills taught in the educational program. All participants completed the OSCE at the same location as the training. The scenarios were developed and verified for content and face validity by a team of educators and researchers with expertise in tobacco cessation through multiple iterative discussions.

The six cases were constructed as follows:

1. An adult female smoker with no significant comorbidities
2. A pregnant woman considering cessation
3. A teenage smoker
4. Relapse prevention for a recently abstinent smoker experiencing withdrawal
5. A smoker with cardiovascular disease
6. A smoker in the precontemplation stage of behavior change

Each participant spent 10 minutes per station with a standardized patient (SP) in a private consultation room. SPs were rigorously trained using a detailed, case-specific script. Faculty members and advanced pharmacy practitioners, trained in OSCE assessment, evaluated performance using structured checklists designed by the same expert group.

Checklists consisted of two components: analytical and global assessments. The analytical section evaluated skills such as establishing rapport, collecting relevant patient information, recommending appropriate interventions, and planning follow-up care. The global section assessed overall communication, confidence, and nonverbal behavior using a 5-point Likert scale. The analytical checklist items varied by case complexity and were scored on 2-, 3-, or 4-point scales. Assessors were blinded to participant group allocation. SPs did not participate in scoring.

Statistical analysis

Data were analyzed using IBM SPSS® 24.0 (IBM Corp., Armonk, NY, USA). Analyses adhered to CONSORT guidelines [13]. Continuous variables were summarized as means ± standard deviations, while categorical variables were reported as counts and percentages. Group differences were evaluated using independent t-tests or Chi-square tests, depending on the variable type.

Primary outcomes compared post-intervention OSCE scores between groups using independent t-tests and univariate linear regression. Secondary analyses adjusted for potential confounding factors, including demographic and practice-related differences, using linear regression. A significance threshold of 2.5% was applied to the total OSCE score and 5% for all other tests.

Ethical approval

The study protocol, instruments, and participant forms received approval from the Qatar University Institutional Review Board (QU-IRB, approval number: QU-IRB 906-E/18).

Results and Discussion

Recruitment and allocation

From July to September 2018, 1,000 pharmacists were screened for eligibility. Of these, 529 were randomly selected and contacted by phone. A total of 164

consented to participate and were randomly assigned to the intervention (n = 77, 46.9%) or control (n = 87, 53.1%) groups **(Figure 1).** Among them, 57 participants (74.0%) completed the intensive tobacco cessation program, and 37 (42.5%) attended the contraception lecture.

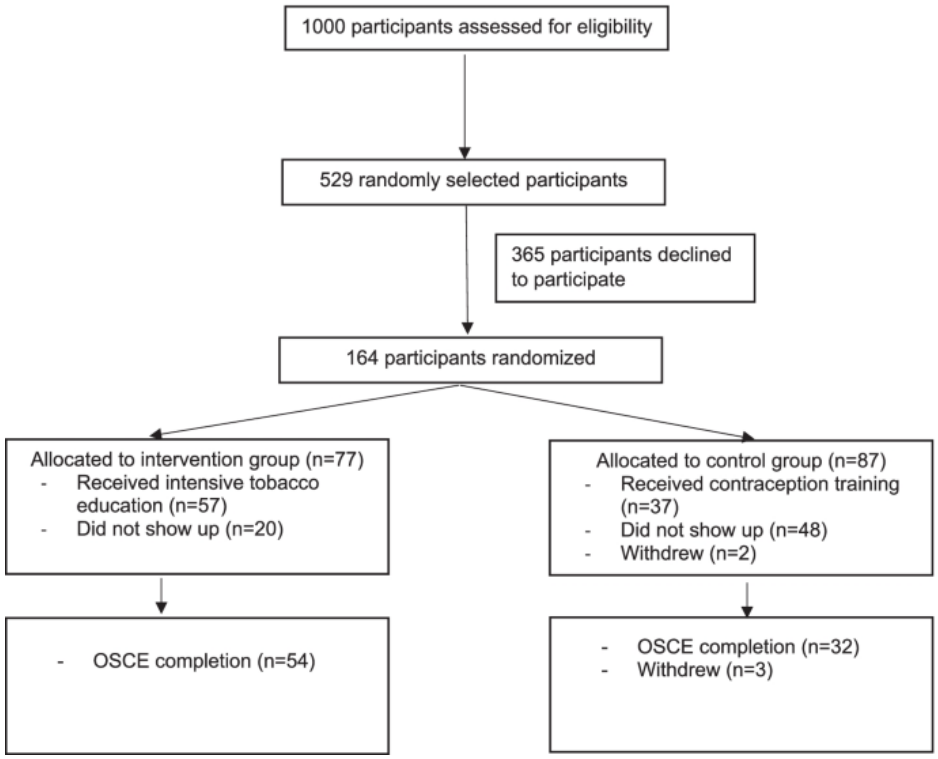

Figure 1. Participant flow chart

Out of the recruited participants, 54 pharmacists in the intervention group (94.7%) and 32 pharmacists in the control group (86.4%) successfully completed the OSCE. The assessments were scheduled during the same week immediately after the completion of both the tobacco cessation training program and the contraception education session.

Participant demographics, professional background, and tobacco-related characteristics

Within the intervention group, males constituted the majority at 56.1%, whereas the control group was predominantly female (55.9%) **(Table 1).** The average age of participants was roughly 36 years in the intervention group and 35 years in the control group. Regarding highest pharmacy qualification, most participants in both groups held a B.Pharm/BSc Pharm, with 85.7% in the intervention group and 76.4% in the control group. No statistically significant differences were observed between the groups in terms of these baseline demographic or professional characteristics.

Similarly, when examining tobacco use habits and prior exposure to tobacco cessation training, no significant differences were identified between the two groups **(Table 2).** More than 80% of participants in both groups were non-smokers. Among the few participants who were current smokers, those in the intervention group smoked more heavily, averaging 12.5 cigarettes per day compared to 3 cigarettes per day in the control group. Nearly all participants reported having no prior formal training related to tobacco cessation practices.

Table 1. Participant socio-demographic and professional characteristics

Characteristic	p-value	Control group (n = 37)	Intervention group (n = 57)
		N (%)	N (%)

Gender			
Male	0.267	15 (44.1)	32 (56.1)
Female		19 (55.9)	25 (43.9)
Mean Age (SD^a)	0.482	34.9 years (6.0)	35.9 years (6.5)
Country of origin			
Egypt	0.276	13 (39.4)	23 (40.3)
India		14 (42.4)	13 (22.8)
Palestine		1 (3.1)	0 (0)
Philippines		4 (12.1)	10 (17.5)
Sudan		1 (3)	5 (8.8)
Syria		0 (0)	1 (1.8)
Nepal		0 (0)	2 (3.5)
Pakistan		0 (0)	3 (5.3)
Highest pharmacy academic qualification			
B.Pharm/BSc Pharm	0.606	26 (76.4)	48 (85.7)
MPharm		4 (11.8)	5 (8.9)
MSc/MPhil/PharmD		2 (5.9)	2 (3.6)
Ph.D		2 (5.9)	1 (1.8)
Country from which the highest pharmacy degree was obtained			
Qatar	0.224	1 (2.9)	0 (0)
Egypt		12 (34.2)	23 (40.3)
India		14 (40)	13 (22.8)
Jordan		1 (2.9)	1 (1.8)
Philippines		5 (14.2)	10 (17.5)
Sudan		1 (2.9)	5 (8.8)
Syria		0 (0)	1 (1.8)
Pakistan		0 (0)	4 (7)
Australia		1 (2.9)	0 (0)
Countries where the pharmacists practiced before moving to Qatar			
Egypt	0.808	14 (37.8)	23 (40.4)
India	0.116	14 (37.8)	13 (22.8)
Philippines	0.602	5 (13.5)	10 (17.5)
Sudan	0.239	1 (2.7)	6 (10.5)
Saudi Arabia	0.7	2 (5.4)	5 (8.8)
United Arab Emirates (UAE)	1	1 (2.7)	1 (1.8)
No previous practice	0.152	2 (5.4)	0 (0)
Pakistan	0.276	0 (0)	3 (5.3)
Nepal	0.518	0 (0)	2 (3.5)
Years of practicing as a pharmacist in Qatar			
Less than 5 years	0.724	18 (51.4)	27 (48.2)
5–10 years		13 (37.1)	24 (42.9)
11–15 years		3 (8.6)	5 (8.9)
More than 16 years		1 (2.9)	0 (0)
Pharmacists' position in the pharmacy			
Pharmacist in training	0.226	1 (2.9)	1 (1.8)
Staff pharmacist		16 (45.7)	36 (63.2)
Pharmacy supervisor		5 (14.3)	9 (15.8)
Pharmacy manager		12 (34.2)	11 (19.3)
Senior pharmacist		1 (2.9)	0 (0)

Table 2. Participant features associated with tobacco

Characteristic	p-value	Control group (n = 37)	Intervention group (n = 57)
		N (%)	N (%)
Smoking status			
Ex-tobacco user	0.895	2 (5.9)	6 (10.7)
Current tobacco user		2 (5.9)	3 (5.4)
Non-tobacco user		30 (88.2)	47 (83.9)
Number of cigarettes per day for current smokers Mean (SD^a)	0.097	3 (2.8)	12.5 (3.5)
Previous training on tobacco use and treatment			
Yes	0.100	5 (15.6)	2 (3.8)
No		27 (84.4)	50 (96.2)

^aStandard Deviation

Competencies in tobacco cessation after the program

Table 3 provides an overview of OSCE performance across cases for the intervention and control arms.

Table 3. Overview of OSCE^a performance

OSCE Domain and Case	Possible Score Range	p-value	Control Group (n = 32) Mean (SD^b)	Intervention Group (n = 54) Mean (SD^b)
Developing Rapport				
Case 1: 'Healthy' adult smoker	0–5	< 0.001*	1.0 (0.7)	2.8 (0.9)
Case 2: Pregnant smoker	0–5	< 0.001*	0.8 (0.8)	2.7 (1.1)
Case 3: Teenager smoker	0–5	< 0.001*	0.5 (0.8)	2.8 (1.1)
Case 4: Relapse prevention in a patient who recently quit smoking and has withdrawal symptoms	0–5	< 0.001*	0.9 (0.9)	2.5 (1.0)
Case 5: Smoker with cardiovascular diseases	0–5	< 0.001*	1.1 (0.7)	2.6 (1.0)
Case 6: Smoker in precontemplation stage of change	0–4	< 0.001*	1.3 (0.8)	3.2 (1.1)
Gathering Information				
Case 1: 'Healthy' adult smoker	0–11	< 0.001*	2.8 (1.5)	5.0 (1.6)
Case 2: Pregnant smoker	0–12	< 0.001*	2.5 (1.6)	6.2 (2.2)
Case 3: Teenager smoker	0–9	< 0.001*	3.0 (1.6)	5.2 (1.6)
Case 4: Relapse prevention in a patient who recently quit smoking and has withdrawal symptoms	0–13	0.005*	4.6 (2.1)	6.0 (2.3)
Case 5: Smoker with cardiovascular diseases	0–12	< 0.001*	3.1 (1.6)	6.3 (2.1)
Case 6: Smoker in precontemplation stage of change	0–11	0.184	4.4 (2.4)	5.0 (2.0)
Management Strategies				
Case 1: 'Healthy' adult smoker	0–10	< 0.001*	2.2 (1.2)	3.5 (1.7)
Case 2: Pregnant smoker	0–6	< 0.001*	0.4 (0.7)	2.2 (1.4)
Case 3: Teenager smoker	0–7	0.002*	1.1 (1.1)	2.1 (1.6)
Case 4: Relapse prevention in a patient who recently quit smoking and has withdrawal symptoms	0–9	< 0.001*	1.7 (1.3)	2.8 (1.3)
Case 5: Smoker with cardiovascular diseases	0–10	< 0.001*	1.3 (1.3)	3.0 (1.9)
Case 6: Smoker in precontemplation stage of change	0–7	0.025*	2.2 (1.7)	3.0 (1.5)
Monitoring/Follow-up				
Case 1: 'Healthy' adult smoker	0–1	< 0.001*	0.4 (0.5)	0.8 (0.4)
Case 2: Pregnant smoker	0–2	< 0.001*	0.1 (0.3)	0.8 (0.7)
Case 3: Teenager smoker	0–1	< 0.001*	0.2 (0.4)	0.7 (0.4)
Case 4: Relapse prevention in a patient who recently quit smoking and has withdrawal symptoms	-	-	-	-
Case 5: Smoker with cardiovascular diseases	0–1	< 0.001*	0.2 (0.4)	0.7 (0.4)

Case 6: Smoker in precontemplation stage of change	0–1	0.001*	0.1 (0.3)	0.4 (0.4)
Global Assessment				
Case 1: 'Healthy' adult smoker	0–5	0.01*	2.4 (1.1)	3.2 (1.4)
Case 2: Pregnant smoker	0–5	< 0.001*	2.4 (1.3)	3.6 (1.0)
Case 3: Teenager smoker	0–5	0.145	3.0 (1.6)	3.5 (1.4)
Case 4: Relapse prevention in a patient who recently quit smoking and has withdrawal symptoms	0–5	< 0.001*	2.1 (1.2)	3.4 (1.2)
Case 5: Smoker with cardiovascular diseases	0–5	< 0.001*	2.6 (1.6)	3.7 (1.1)
Case 6: Smoker in precontemplation stage of change	0–5	0.256	3.3 (1.2)	3.6 (1.1)

^aObjective Structured Clinical Examination
^bStandard Deviation

Performance in patient rapport

Across every OSCE scenario, pharmacists from the intervention arm earned much higher aggregate marks for patient rapport than control participants. Specifically, average rapport marks varied from 2.5 to 3.2 in the intervention arm versus 0.5 to 1.3 in the control arm for the six cases.

Performance in information gathering

Those exposed to focused tobacco training showed superior results in gathering information compared to the contraception-trained group. Average marks in this area were notably elevated in the intervention arm for all cases except the sixth. For the first five cases, intervention averages spanned 5.0 to 6.3, against 2.5 to 4.6 for controls.

Performance in treatment planning

For treatment planning, per-case marks in the intervention arm fell between 2.1 and 3.5, while control marks ranged from 0.4 to 2.2. Intervention pharmacists consistently posted higher aggregate marks across the six cases.

Performance in follow-up planning

Intervention participants proposed more suitable follow-up arrangements, registering markedly higher averages than controls. In cases one, two, three, five, and six, intervention follow-up averages were 0.4 to 0.8 versus 0.1–0.4 for controls. The fourth case lacked a follow-up element.

Overall case ratings

Global ratings per case were also substantially higher among intervention participants in most scenarios, excluding cases three and six. For cases one, two, four, and five, intervention global averages ranged from 3.2 to 3.7 compared with 2.1 to 2.6 in controls.

Aggregate analytical and full OSCE marks

Aggregate analytical marks (combining rapport, information gathering, treatment planning, and follow-up) proved significantly superior for the tobacco-trained pharmacists in every case **(Table 4).**

Table 4. Raw and adjusted aggregate and analytical OSCE^† performance

Case	Score Type	Adjusted Difference^a	Unadjusted Difference	Contraception Training Group (Control)	Smoking Training Group (Intervention)
		Standard Deviation	Mean	Standard Deviation	Mean
Case 1: 'Healthy' adult smoker	Total Analytical Score (# of items: 26)	2.4	6.4	3.0	12.1
	Final Score	3.1	8.8	4.0	15.2
Case 2: Pregnant smoker	Total Analytical Score (# of items: 24)	2.2	3.8	3.8	11.8
	Final Score	3.0	6.2	4.5	15.3
Case 3: Smoking teenager	Total Analytical Score (# of items: 20)	2.3	4.7	3.4	10.7
	Final Score	3.4	7.7	4.3	14.2

Case 4: Relapse prevention in a patient who recently quit smoking and has withdrawal symptoms	Total Analytical Score (# of items: 26)	3.4	7.1	3.4	11.2
	Final Score	4.4	9.2	4.2	14.6
Case 5: Smoker with cardiovascular diseases	Total Analytical Score (# of items: 27)	2.7	5.7	3.9	12.6
	Final Score	3.6	8.3	4.7	16.3
Case 6: Smoker in precontemplation stage of change	Total Analytical Score (# of items: 23)	4.0	8.1	3.6	11.7
	Final Score	4.9	11.3	4.2	15.2

^aAdjusted for age, gender, years of practice as a pharmacist in Qatar, smoking status, and prior training related to tobacco use and treatment
*statistically significant

The tobacco-focused training arm recorded markedly superior full OSCE marks versus controls in all scenarios. Average full marks spanned 14.2 to 16.3 in the intervention arm and 6.2 to 11.3 in controls across the six cases **(Table 4).**

Even after controlling for confounders, including age, gender, practice duration in Qatar, smoking status, and earlier tobacco training, the intervention arm maintained significantly higher adjusted aggregate analytical and full OSCE marks across every case **(Table 4).**

This study represents the first randomized controlled trial (RCT) in Qatar—and more broadly, the Middle East—focused on the development, delivery, and evaluation of an intensive educational program addressing tobacco use and dependence for community pharmacists, assessed through an Objective Structured Clinical Examination (OSCE). The results provide clear evidence that structured, focused training in tobacco cessation substantially enhances pharmacists' practical skills and professional competencies. Participants who completed the tobacco cessation program demonstrated higher performance across key domains—including rapport establishment, information gathering, patient management, and follow-up planning—compared with pharmacists in the control group. These findings align with similar studies involving pharmacists and pharmacy students in other contexts [14, 15].

Our experience demonstrates both the feasibility and tangible benefits of implementing targeted tobacco cessation education for community pharmacists in Qatar. Previous literature highlights that training programs can improve pharmacists' readiness and confidence to deliver smoking cessation counseling [16-18]. For example, pharmacists who received structured cessation training were more likely to advise patients about quitting and correctly recommend cessation products [16]. Another randomized trial found that patients counseled by trained pharmacists achieved higher cessation rates compared with those receiving counseling from untrained pharmacists [17]. Given the accessibility of community pharmacists in Qatar and their reported interest in offering cessation services [5], the inclusion of comprehensive tobacco cessation training as part of continuous professional development (CPD) programs appears highly warranted. Such initiatives could strengthen pharmacists' capacity to help reduce tobacco use across the population.

Globally, OSCEs have been widely employed to evaluate the effectiveness of tobacco cessation interventions for healthcare students and professionals [19–26]. In the U.S., primary care clinicians in Denver and Minneapolis were randomized to moderate- or high-intensity motivational interviewing (MI) training. OSCE performance revealed that those receiving high-intensity MI training scored significantly better on three of six global Motivational Interviewing Treatment Integrity scale items [19]. At a German medical school, third-year students were randomized to online versus in-person smoking cessation courses. Median OSCE scores favored the attendance group (70.8% vs. 62.8%; $p = 0.087$), with

one counseling component ("Assist") showing statistical significance (66.7% vs. 51.4%; p = 0.049) [20].

Further evidence from Germany demonstrated that medical students exposed to a multimodal interactive cessation module had higher OSCE scores than controls (71.5% vs. 60.5%; p < 0.001) [24]. In the U.S., OSCEs with standardized patients were used to assess tobacco dependence education for first-year dental students, and participation improved both knowledge and practical skills [25]. Another German study targeting fourth-year dental students showed that a teaching intervention increased OSCE scores (74.9% vs. 44.7%; p < 0.001; d = 2.3), reflecting gains in knowledge, communication, and attitudes [26].

While these international findings are encouraging, they cannot be directly generalized to Qatar because the structure and practice of community pharmacy there are distinct. This underlines the need for a locally tailored, intensive tobacco cessation program for community pharmacists, with skill and knowledge improvements assessed through OSCEs.

Key strengths of our program include its design, which followed the Core Competencies for Evidence-based Treatment of Tobacco Dependence established by the Association for the Treatment of Tobacco Use and Dependence (ATTUD). The OSCE component evaluated pharmacists' performance across six diverse, tobacco-related case scenarios, each representing patients at different stages of readiness to quit. Compared with previous studies, our prospective design with a control group undergoing identical assessments provides a stronger basis for evaluating program effectiveness.

It is important to point out that the intervention group did not demonstrate notable improvement on the final OSCE case, which involved a patient in the pre-contemplation stage of quitting smoking, meaning the patient was not yet motivated to stop. Effectively engaging such patients and fostering rapport is a key step in helping them consider cessation. Future educational programs should therefore place greater emphasis on strategies for working with unmotivated smokers. This could include additional simulated cases and hands-on exercises specifically targeting patients who are resistant to change.

Another observation is that while the intervention group reached the intended sample size, the control group fell short. One likely explanation is the difference in topic appeal: "tobacco cessation" may have been perceived as more relevant and interesting than "women's health and contraception," resulting in lower recruitment for the control group.

Several limitations should be considered when interpreting these findings. First, the study design and nature of the training made blinding participants or concealing allocation impossible, which may have introduced bias—participants in the intervention group could have been more motivated or better prepared for the OSCE. Second, baseline assessments of participants' tobacco cessation skills were not conducted prior to training, limiting the ability to measure individual improvement. Third, recruiting participants for both the training and OSCE proved challenging, particularly given the demanding work schedules of community pharmacists in Qatar, which contributed to the control group not reaching its planned sample size. Additionally, this study did not evaluate whether OSCE performance improvements translated into actual changes in pharmacists' practice.

Despite these constraints, the study provides evidence that an intensive tobacco cessation training program can strengthen community pharmacists' skills. Future research should explore whether enhanced OSCE performance is reflected in real-world counseling, potentially using unannounced standardized patient visits or simulated client assessments to observe changes in practice. Moreover, subsequent studies should assess the program's impact on smoking cessation outcomes among patients in Qatar.

Conclusion

This research demonstrates that a structured, intensive tobacco cessation education program can meaningfully improve pharmacists' objectively measured competencies and counseling abilities. Enhancing these skills may contribute to a reduction in tobacco use and dependence among patients. The program developed in this study could be scaled up within Qatar's continuing professional development (CPD) initiatives, helping to build a critical mass of pharmacists equipped to deliver effective tobacco cessation interventions.

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