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Original Research

Knowledge, attitude, practice and perceived barriers towards smoking cessation services among community pharmacists

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Abstract

Introduction: With more than one billion current smokers, 80% of them living in low and middle-income countries, tobacco smoking is considered a global public health problem. Jordan has one of the highest estimate rates of tobacco use in the region and world. Still, tobacco use interventions, that could significantly reduce the number of smoking-related diseases and reduce health care costs, are scarce. While such interventions could be carried out by community pharmacists, given their unique position to counsel patients and provide effective cessation interventions, the role of community pharmacists in tobacco control services in Jordan has never been fully investigated. **Objective:** This study aimed at assessing the community pharmacists' knowledge, attitudes, and practice towards smoking cessation and identifying their perceived barriers for smoking cessation counselling utilizing a sample of community pharmacists in Northern Jordan. **Method:** A cross-sectional study was conducted among community pharmacies in Irbid city, North of Jordan, between April and August 2018. A random sample of 95 pharmacies was selected using the multistage random sampling technique. A structured English questionnaire, consisting of 5 parts, was used. The Survey assessed pharmacists' socio-demographics, knowledge, attitude, practice and perceived barriers related to tobacco use cessation services. **Results:** One hundred and fifty pharmacists completed the survey. Their mean age was 30.71±10.10 years. The mean of pharmacists' knowledge score was 3.74±0.38, while their positive and negative attitude were 3.87±0.43 and 3.18±0.66 respectively. Pharmacists' mean smoking cessation practice was 2.01+0.64. Barriers to providing cessation interventions included the lack of training on nicotine replacement therapy products (86%), the lack of smoking cessation programs (84%) and low demands from smokers (83.3%). **Conclusion:** While knowledge related to tobacco use cessation services among the community pharmacists was sub-optimal, a good positive attitude and a low practice levels were observed. The lack of educational materials, low patients' demand, knowledge deficits, low training and the lack of cessation programs have been identified as barriers hindering the provision of smoking cessation services. Furthermore, the study identified factors that will increase community pharmacists' participation in smoking cessation, help in raising pharmacists' awareness of smoking as a public health problem and the importance of their role.

Keywords: Smoking; Pharmacist; Cessation; Jordan; Waterpipe use; Tobacco use; Counselling; Smoking Cessation programme

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INTRODUCTION

Tobacco use is a global public health problem, especially in the developing countries. The World Health Organization (WHO) estimates that there are more than one billion current smokers worldwide and that more than 80% of them live in low and middle-income countries.[1] High-income countries, which are showing a decline in tobacco consumption,[2] while tobacco use is becoming increasingly prevalent in low-income and middle-income countries,[3] where cigarette consumption and waterpipe smoking is increasing among women and youth.[4-6]

By 2030, around 70% of deaths due to tobacco use worldwide are expected to occur in developing countries.[3] Jordan, a developing country in the Middle East is witnessing a great burden of tobacco-related diseases and have an increased rate of tobacco use among youth and women. Jordan has one of the highest prevalence of smoking relative to other countries in the Eastern Mediterranean Region.[4-6] Tobacco use is reported by 38.4% of the total population with more two thirds (65.5%) of the Jordanian male population over 15 years of age being considered regular smokers.[7,8]

The culture of tobacco use in Jordan has been "resistant to

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change". Legislations in this regard are well established but are in paralysis. This is expected to increase the burden of tobacco-related diseases. This is because the habit of smoking is common not only among men but also among youth and women.[9,10]

Smoking cessation (SC) interventions can greatly reduce the number of smoking-related diseases and subsequently reduce health care costs. Effective SC strategies have a very favourable cost-benefit ratio, similar to that of mammography in breast cancer.[11]

According to the Centres for Disease Control and Prevention (CDC), tobacco cessation programs are recommended to reduce smoking-related morbidity and mortality.[12] Previous research findings reported that SC at any age results in a significant and immediate beneficial impact on overall health, by reducing risks of cardiovascular disease, stroke, and tobacco-related cancers,[13,14]. Yet only 3% to 5% of untreated smokers are successfully maintaining prolonged abstinence after quitting.[15] There is growing evidence that smokers who receive clinician assistance are more contented with their healthcare compared to those who do not.[16] Hence, encouraging SC through healthcare professionals can improve their patients' quality of life and increase their life span.[16,17] Even simple and brief advice from healthcare professionals can significantly increase SC rates.[18-20] Community pharmacists, due to their unique place and ability in counselling patients can play a vital role in SC services.[21] Several studies have revealed that community pharmacists' interventions can be cost-effective in helping patients quit smoking.[22-24] However, many studies reported that pharmacists do not provide any SC services to patients.[22,25-27] Fewer than 5% of patients visiting community pharmacies reported being asked about their tobacco use by pharmacists.[25]

Assessment of knowledge, attitude, practice and barriers of community pharmacists towards SC has never been addressed in Jordan. The results are expected to establish baseline information about the knowledge, attitude and practice among pharmacists, and to identify factors that will increase community pharmacists' participation in SC. Moreover, the results will help in raising pharmacists' awareness of smoking as a public health problem, highlighting the importance of their role, their positive attitude, their interventions impact and their appropriate counselling. It will also identify barriers to SC activities and propose strategies that can overcome them.

Study design

A descriptive cross-sectional survey using a questionnaire was conducted among pharmacists in Irbid city in northern Jordan between April and August 2018. The names and locations of all community pharmacies (N=250) in the city was obtained from Jordan Pharmacists Association (JPA) and served as a sampling frame. A random sample of 95 pharmacies was chosen by multistage random sampling. At first, a list of all pharmacies was generated for each geographic location, then the pharmacies identified in these locations were verified and distributed across 75 streets. The Streets were then divided according to the number of pharmacies in each street. The streets were categorized into major, which has 6-12 pharmacies, and minor streets with 1 to 5 pharmacies. A random sample of pharmacies was selected with fifty-five pharmacies from major streets and 40 pharmacies from minor streets. Community pharmacies were approached by a researcher at their perspective pharmacy premises to obtain informed consent for participating in the study. For each selected pharmacy, the number of pharmacists, shifts, and the pharmacy size were collected. From each pharmacy, one shift was randomly selected, using a simple random sampling technique, and then all registered pharmacists working during the selected shift were eligible to participate in the study. Trainee pharmacists and pharmacist assistants were excluded.

Ethical approval

The study was approved by the Institutional Review Board (IRB) at King Abdulla University Hospital (KAUH) (9/114/2018).

Data collection

Questionnaires were hand distributed to the pharmacists at their respective premises and collected immediately upon completion.

Study instrument

A structured self-administered survey in the English language was used. The survey consisted of five main sections. Demographics, knowledge, attitudes, practice and perceived barriers (KAP&B) pertaining to smoking cessation. KAP&B questions were developed based on previous studies evaluating pharmacists.[8,22,25,28-34] The Survey was first reviewed by experts in public health and tobacco intervention. The content was validated by selecting a pilot sample of 10 pharmacists to evaluate the initial draft of the questionnaire in terms of clarity and comprehension of the questions. Approximately 15 to 20 minutes were needed to complete the survey. The final version of the survey was composed of 74 questions/statements other than the demographic ones. All questions/statements were close-ended and covered: 1. Pharmacists' general knowledge about smoking cessation services and smoking cessation products (24 questions; Appendix A Table A1), 2. Pharmacists' attitude toward SC (20 statements; Appendix A Table A2), 3. Pharmacists' practice toward SC (11 statements; Appendix A Table A3), and 4. Barriers perceived by pharmacists to provide SC counselling (19 statements; Appendix A Table A4).

Age, Gender, academic degree, years of experience, number of years since graduation, pharmacy description, time open to the public, shift time, pharmacy location, pharmacist cigarette and waterpipe use status, number of pharmacists during a shift, number of pharmacy technicians during a shift, number of adult patients seen per day, attendance of educational programs on SC, available SC products at the pharmacy, and consumers request to support to quit smoking were all evaluated at first.

The section on knowledge included four parts which utilized a 5-point Likert scale and based on the local guidelines for tobacco dependence treatment regarding SC and SC products. Participants' knowledge was scored according to their answers on a scale of 1 (Strongly disagree), 2 (Disagree), 3 (Neutral),

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4 (Agree) and 5 (Strongly agree). A maximum- knowledge score of 120 and a minimum of 24 was obtained from each participant. The higher the score, the better the knowledge level the participant has.

A total knowledge mean score was calculated for each participant by summing all responses and dividing it by the number of questions to evaluate each participant's knowledge about SC and SC products.

The section concerning attitude consisted of a total of twenty statements utilizing the Likert scale; fifteen positive and five negative statements related to attitudes toward SC adopted from previous research was used.[25,29,30] Participants' attitude was scored according to their answers on a scale of;1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly agree).

Pharmacists were asked about their SC practices at their pharmacies from three main aspects by: 1. Assessing and advising patients 2. Assisting, referring, and following-up patients 3. Providing counselling

The questions utilizing the Likert scale are based on previous research.[29-31] Participants' practice was scored according to their answers on a scale of; 1 (Never), 2 (Seldom), 3 (Sometimes), 4 (Usually) and 5 (Always). A maximum practice score of 55 and a minimum of 11 was obtained. The higher the score, the better the practice toward SC the participant has.

The total mean of participants' practice scores

- A total practice mean score was calculated for each participant (by summing all responses and dividing it by the number of questions) to evaluate each participant's practice toward SC. Barriers perceived by pharmacists to provide smoking cessation counselling
- Perceived barriers to providing SC counselling in the pharmacy were assessed by asking pharmacists to identify possible barriers on three levels by a 'Yes' or 'No' answer:
- Barriers on pharmacist's level; which included 6 items
- Barriers on practice site level; which included 10 items
- Barriers on patients 'level; which included 3 items

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 23 was used to analyze the data. Demographic data, responses to the knowledge, attitude, practice and perceived barriers sections were presented using number (percentages) and means (Standard Deviation (SD)) as appropriate. Mean knowledge, attitude and practice scores were calculated for each participant. Mean scores were compared by demographic variables using one-way ANOVA and t-test as appropriate. The relationship between the mean of knowledge, attitude and practice were investigated by performing the Pearson correlation coefficient. Alpha level was set at 0.05.

RESULT

A total of ninety-five pharmacies were visited. One hundred fifty-seven pharmacists were enrolled in the study. Seven pharmacists refused to participate due to time constrain. A total of 150 pharmacists completed the questionnaire. The response rate was 95.5%.

Characteristics of participants

The mean age of the sample was 30.71±10.1 years (range 22 to 69 years). Females represented were the majority of the study sample (77.6%). Most of the participants had a bachelor's degree in pharmacy (84.0%), and 77.3% had one year or more of work experience. Mean years of experience was around 7±8.87. For those who are cigarette smokers and waterpipe users, the mean number of cigarettes consumed per day = 17.29±13.86 and 10.67±10.95 heads per week for waterpipe users. 95.0% reported never receiving any training in smoking cessation. Nicotine gum was the most available product in pharmacies (77.3%) followed by Varenicline (22%) then nicotine patches (14.7%). Participants reported that more than half of patients who rarely smoke advice from a pharmacist for quitting smoking (Table 1 and Table 2).

Table 1. Characteristic of Study Participants (N= 150)

Variable	N	%
Age group (years)		
22-24	35	23.3
25-27	46	30.7
28-31	34	22.7
≥ 32	35	23.3
Gender		
Male	35	23.3
Female	115	76.7
Academic degree		
Bachelor of pharmacy	126	84.0
Pharm D	17	11.3
Master's degree	7	4.7
Years of experience (year)		
≤ 1	34	22.7
1- <4	41	27.3
4-7	38	25.3
≥ 8	37	24.7
Number of years since pharmacy graduation (year)		
≤ 1	28	18.7
1- ≤ 3	39	26.0
3 - 5	24	16.0
6-11	29	19.3
≥ 12	30	20.0
Pharmacy description		
Independent	95	63.3
Chain	55	36.7
Time open to public (hours)		
12	45	30.0
16	95	63.3
24	10	6.7
Shift time		
Shift A	79	52.7
Shift B	46	30.7
Shift A+B	25	16.6

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Pharmacy location		
Shopping area	91	60.7
Near hospital	36	24.0
Near medical centre	86	57.3
Residential area	68	45.3
Pharmacist tobacco use		
Smoker	13	8.7
None-smoker	137	91.3
Waterpipe user		
Yes	15	10.0
No	135	90.0
Number of pharmacists in the pharmacy during the shift		
1	116	77.3
>1	34	22.7
Number of pharmacy technicians in the pharmacy during the shift		
None	122	81.3
1	23	15.3
>1	5	3.4
Number of adult's patients seen per day		
≤ 20	43	28.7
21-35	33	22.0
36-50	43	28.7
>50	31	20.6
Attending educational program on smoking cessation		
Yes	6	4.0
No	144	96.0
Available smoking cessation products at the pharmacy		
Gum	116	77.3
Patch	22	14.7
Varenicline	33	22.0
Consumers request support to quit smoking		
Very often	4	2.7
Often	11	7.3
Sometimes	39	26.0
Rarely	77	51.3
Never	19	12.7

Pharmacists' knowledge about SC products

Pharmacists' knowledge level about SC products was assessed. The majority of pharmacists (86.7%) agreed on nicotine gum availability in both doses of 2 and 4 mg. Only 40.0% of participants agreed that nicotine gum is not chewed like regular gum while half (50.0%) agreed on the side effects caused by nicotine gum. However, only 32.7% of pharmacists strongly agreed or agreed on nicotine patch available doses. Three-quarters of them agreed that nicotine patches should be applied to a clean, dry area of hairless skin on the upper arm, back, or shoulder. Pharmacists' responses varied concerning Varenicline use, side effects and its effectiveness in helping smokers to quit smoking. Half of the pharmacists strongly agreed or agreed that Varenicline should be used for 3 months to get the desired effect and it can also help waterpipe smokers to quit. Only 17.4% of subjects strongly agreed or agreed that Varenicline may be stopped abruptly without the need for tapering off the dose (Table 3).

Pharmacists' attitude toward smoking cessation services

The majority agreed that most smokers can quit when they decide to and have the willingness to (92.6%). Also, more than 87.3% agreed that tobacco use is an addiction. The majority agreed that nicotine replacement products improve smokers' chance of quitting and they have a responsibility to advise patients to quit smoking (86.0% and 84.7% respectively). More than half of the pharmacists had a positive attitude towards patients' appreciation of pharmacists' advice about SC as well as their confidence in providing effective SC counselling services (62.7% and 85%, respectively). However, less than half of the respondents agreed that the majority of smokers are willing to quit smoking (41.4%). Pharmacists' negative attitude was attributed to many reasons, most importantly, 74.0% of them were convinced that if a patient cannot quit using tobacco on his own, there is little chance that he do with help. About 71% of the pharmacists agreed that there is no reimbursement to pharmacists for their services of SC counselling, while 25.4% agreed that SC counselling is a waste of time (Table 4).

Pharmacists' practice toward SC services

More than one-third of the participants reported that they have never assessed smoker patients for their readiness to quit smoking, while 22.7% reported that they seldom do so. Around a quarter of pharmacists reported that they always or usually ask about the smoking status of their patients. Pharmacists reported that they have either never (14.0%) or seldom (20%) advised their patients to quit smoking. The majority of pharmacists have rarely or never provided educational materials that can help their patients to quit smoking (93.3%), referred them to SC clinics (90.7%), referred patients to alternative therapy (96%), and/or followed up their patients to assess their SC progress (89.4%). More than two-thirds of the study sample has never provided patients or their family members with SC counselling (69.3%) (Table 5).

Table 2. Characteristics of participants

Variable	Mean ± *SD	Minimum	Maximum
Age (years)	30.71±10.10	22	69
Years of experience	6.97±8.87	0.08	40
Number of years since pharmacy graduation	7.47±9.24	0.08	44
Number of cigarettes per day	17.29±13.86	2	40
Number of waterpipe heads per week	10.67±10.95	1	35
Number of adult's patients seen per day	47.73±41.44	5	300

*SD: Standard deviation

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Table 3. Pharmacists knowledge about smoking cessation products (N=150)

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Gum					
Nicotine gums are available in 2mg and 4mg dosages.	117(78.0)	13(8.7)	14(9.3)	4(2.7)	2(1.3)
Nicotine gum is not chewed like regular gum.	34(22.7)	24(16.0)	30(20.0)	42(28.0)	20(13.3)
Patients using nicotine gum should not eat or drink 15 minutes before and during use.	39(26.0)	48(32.0)	51(34.0)	10(6.7)	2(1.3)
The taste of nicotine gum may be unpleasant at the start, but patients are advised to continue use.	52(34.7)	40(26.7)	39(26.0)	15(10.0)	4(2.6)
Some side effects of nicotine gum are mouth soreness, dyspepsia and jaw ache.	40(26.7)	39(26.0)	51(34.0)	17(11.3)	3(2.0)
Patch					
The 16-hour patch is available in 10mg, 15mg, 25mg dosages.	27(18.0)	22(14.7)	98(65.3)	2(1.3)	1(0.7)
The Patch should be rotated and not put on the same site on consecutive days.	38(25.3)	47(31.3)	51(34.0)	12(8.0)	2(1.4)
The Patch should be applied to clean, dry intact areas of hairless skin (upper arm, back, shoulder).	58(38.7)	55(36.7)	33(22.0)	4(2.6)	0(0.0)
The side effects of the patch are dizziness, headache and gastrointestinal discomfort.	25(16.7)	41(27.3)	63(42.0)	20(13.3)	1(0.7)
Nicotine patches are long-acting Nicotine Replacement Therapy (NRT).	53(35.3)	45(30.0)	41(27.3)	7(4.7)	4(2.7)
The patch has a slower onset of delivery than NRTs.	35(23.3)	42(28.0)	57(38.0)	13(8.7)	3(2.0)
Nicotine Replacement Therapies (NRT; Gum and Patch) **Waterpipe (Arghile)**					
In stable cardiovascular disease patients, using NRT presents a lesser hazard than continuing to smoke.	64(42.7)	51(34.0)	29(19.3)	5(3.3)	1(0.7)
Use NRT *with care* in patients with gastritis, peptic ulcers, and esophagitis.	34(22.7)	of65(43.3)	34(22.7)	13(8.7)	4(2.6)
The period from waking up to first cigarette should be considered in selection of NRT form.	38(25.3)	58(38.7)	48(32.0)	6(4.0)	0(0.0)
The number of cigarettes smoked daily should be considered in the selection of NRT dose.	73(48.7)	60(40.0)	13(8.6)	3(2.0)	1(0.7)
The number of waterpipe heads should be considered in the selection of NRT dose.	57(38.0)	57(38.0)	25(16.7)	8(5.3)	3(2.0)
NRT can be used to help waterpipe smokers to quit.	42(28.0)	62(41.3)	30(20.0)	13(8.7)	3(2.0)
Varenicline (Champix)					
Varenicline is available as 0.5 and 1 mg.	66(44.0)	13(8.6)	69(46.0)	1(0.7)	1(0.7)
Varenicline must be taken with food and a full glass of water to minimize nausea.	34(22.7)	35(23.3)	77(51.3)	4(2.7)	0(0.0)
Patients with diabetes mellitus should be advised to monitor their blood sugar levels more closely when using varenicline.	13(8.6)	26(17.3)	107(71.3)	3(2.0)	1(0.7)
The common adverse effect of using varenicline are nausea, constipation and flatulence.	28(18.7)	39(26.0)	82(54.6)	1(0.7)	0(0.0)
Varenicline may be stopped abruptly, and no need for taper.	10(6.7)	16(10.7)	71(47.3)	30(20.0)	23(15.3)
Varenicline should be used for 3 months to get the desired effect.	38(25.3)	37(24.7)	70(46.7)	3(2.0)	2(1.3)
Varenicline can be used to help waterpipe smokers to quit.	31(20.7)	42(28.0)	66(44.0)	9(6.0)	2(1.3)

Table 4. Pharmacists attitude toward smoking cessation (N=150)

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Positive statements					
Most smokers can quit if they really want to.	104(69.3)	35(23.3)	3(2.0)	7(4.7)	1(0.7)
Tobacco use is an addiction.	100(66.7)	31(20.6)	13(8.7)	5(3.3)	1(0.7)
NRT (patch, gum, etc.) improves smokers' chance of quitting.	44(29.3)	85(56.7)	14(9.3)	6(4.0)	1(0.7)
Pharmacists have a responsibility to advise patients to quit smoking.	42(28.0)	85(56.7)	12(8.0)	10(6.6)	1(0.7)
Pharmacists should receive relevant training to assist patients who want to stop smoking.	76(50.7)	49(32.6)	12(8.0)	12(8.0)	1(0.7)

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When a person has been smoking for many years there is always a point in helping him or her to quit.	38(25.3)	84(56.0)	10(6.7)	14(9.3)	4(2.7)
Tobacco use can be treated successfully using pharmacotherapy and counseling.	44(29.3)	77(51.4)	22(14.7)	5(3.3)	2(1.3)
It is important for me as a pharmacist to ask patients if they smoke.	45(30.0)	67(44.7)	16(10.7)	20(13.3)	2(1.3)
Waterpipe users need cessation therapy to quit smoking.	40(26.7)	66(44.0)	22(14.7)	15(10.0)	7(4.6)
Varenicline improves smokers' chance of quitting.	39(26.0)	63(42.0)	41(27.3)	6(4.0)	1(0.7)
With most smokers, pharmacists can be effective in promoting smoking cessation.	29(19.3)	72(48.0)	23(15.3)	19(12.7)	7(4.7)
Even if a patient's illness is unrelated to smoking, pharmacists should offer smoking cessation advice.	27(18.0)	71(47.3)	13(8.7)	31(20.7)	8(5.3)
Patients appreciate it when I provide smoking cessation advice.	23(15.3)	71(47.4)	33(22.0)	18(12.0)	5(3.3)
I am confident that I can offer smoking cessation services effectively.	17(11.3)	70(46.7)	27(18.0)	31(20.7)	5(3.3)
The majority of smokers want to quit.	28(18.7)	34(22.7)	13(8.7)	49(32.6)	26(17.3)
Negative statements					
If a patient can't quit using tobacco on his own, there is little that I can do.	21(14.0)	90(60.0)	17(11.3)	18(12.0)	4(2.7)
There is not much economic reward for pharmacists in advising about quitting smoking.	48(32.0)	58(38.7)	12(8.0)	23(15.3)	9(6.0)
Most patients don't want desirable advice from their pharmacist.	13(8.7)	64(42.7)	28(18.6)	32(21.3)	13(8.7)
Talking with smokers about quitting will discourage their return as customers.	9(6.0)	45(30.0)	22(14.7)	42(28.0)	32(21.3)
Counseling for cessation is not an efficient use of my time.	10(6.7)	28(18.7)	18(12.0)	65(43.3)	29(19.3)

Table 5. Pharmacists practice toward smoking cessation (N=150)

Statements	**Always**	**Usually**	**Sometimes**	**Seldom**	**Never**
Assessing and advising patients					
Asked patients about their smoking status.	8(5.3)	29(19.3)	67(44.7)	24(16.0)	22(14.7)
Advised patients to quit smoking.	16(10.7)	31(20.7)	52(34.6)	30(20.0)	21(14.0)
Assessed patients' readiness to quit smoking.	6(4.0)	13(8.7)	41(27.3)	34(22.7)	56(37.3)
Assisting, referring and following up					
Advised patients on the use of gum or patch to quit smoking.	9(6.0)	22(14.7)	43(28.7)	44(29.3)	32(21.3)
Advised patients on the use of varenicline to quit smoking.	4(2.7)	10(6.7)	27(18.0)	33(22.0)	76(50.6)
Assisted patients in quitting by counseling them on behavioral techniques for quitting.	6(4.0)	21(14.0)	52(34.6)	37(24.7)	34(22.7)
Assisted patients in quitting by giving them educational materials related to quitting smoking.	3(2.0)	1(0.7)	6(4.0)	17(11.3)	123(82.0)
Arranged follow up with patients to assess their progress in quitting smoking.	2(1.3)	4(2.7)	10(6.6)	22(14.7)	112(74.7)
Referred smokers to doctors in smoking cessation clinics.	3(2.0)	2(1.3)	9(6.0)	18(12.0)	118(78.7)
Referred smokers to non-doctors (e.g., alternative therapies as acupuncture).	1(0.7)	2(1.3)	3(2.0)	15(10.0)	129(86.0)
Providing counseling					
Provided patients or family members with smoking cessation counseling.	4(2.7)	9(6.0)	33(22.0)	24(16.0)	80(53.3)

Barriers toward SC perceived by pharmacists

Barriers of the SC services can occur at the pharmacist, patient, or practice site level. The need for more training on nicotine replacement therapy including gums, patches and Varenicline is the most hindrance. Around 60% agreed that the lack of knowledge about drug therapy of SC prevents pharmacists from assisting their patients in quitting smoking (59.3%). Only 20% of pharmacists agreed that the lack of desire to counsel patients for SC could impede the SC process. At the practice level, most of the pharmacists agreed that the lack of both SC programs and educational materials were the commonest barriers to conducting SC process (84% and 80.7%, respectively). Three-quarters of pharmacists agreed that the lack of support from an organization concerned with SC is considered an important barrier to SC counselling.

The majority (83.3%) reported that low patient's demand for SC

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counselling was a major barrier that discourages pharmacists from providing SC counselling. Moreover, 71.3% of pharmacists agreed that customers are always in a hurry which prevents pharmacists from providing proper counselling. Only 25.3% agreed that patients' lack of trust toward pharmacists could be an issue (Table 6).

Pharmacists' mean scores of knowledge, attitude and practice

Overall, the mean knowledge score was 3.74±0.38. The mean NRT knowledge score amongst SC products was the highest 4±0.54. About positive attitude, the mean score was 3.87±0.43. For pharmacists' practice, the mean score for all questions was 2.01±0.64. Assessing and advising patients mean score was the highest at 2.66±0.92 (Table 7).

Categories of knowledge and practice mean scores of participants

The categories for pharmacists' knowledge and practice of participants are listed in Table 8. Responses were almost equal in each category. The highest is (36.0%) with regard to knowledge.

Relationship between knowledge and social demographic characteristics

Statistically significant associations were identified between pharmacists' knowledge of smoking services and the age, the academic degree of pharmacists and the availability of SC products in their pharmacies. Pharmacists who are between 28 and 31 years old were more knowledgeable in SC services ($p<0.005$). Also, pharmacists with Pharm D degrees showed more knowledge in smoking cessation interventions ($p=0.019$). Pharmacy description and its opening time to the public also were significantly associated with the knowledge of smoking SC services. Pharmacists working in chain pharmacies as well as those who work at pharmacies that open 24 hours a day showed more knowledge of these SC services ($p<0.05$) (Table 9).

Table 6. Pharmacists perceived barriers toward smoking cessation (N=150)

Barriers	Yes	No
Pharmacist		
I need more training on how to use nicotine gums and patches.	129(86.0)	21(14.0)
I need more training on how to use varenicline to help smokers to quit.	127(84.7)	23(15.3)
I do not know enough about drug therapy for smoking cessation to assist patients to quit.	89(59.3)	61(40.7)
It is difficult to recognize patients who smoke or use tobacco products.	69(46.0)	81(54.0)
I do not feel comfortable asking patients if they smoke or use tobacco products.	57(38.0)	93(62.0)
I dislike counseling patients for tobacco cessation.	30(20.0)	120(80.0)
Practice site		
Lack of Cessation programs.	126(84.0)	24(16.0)
I lack smoking cessation educational materials.	121(80.7)	29(19.3)
I lack support from organizations concerned with smoking cessation.	113(75.3)	37(24.7)
Unavailability of varenicline.	71(47.3)	79(52.7)
I Lack a private area for counseling.	66(44.0)	84(56.0)
Unavailability of NRT.	61(40.7)	89(59.3)
The pharmacy lacks adequate staff.	59(39.3)	91(60.7)
I am too busy due to a large workload.	58(38.7)	92(61.3)
Pharmacy management does not encourage counseling for OTC nicotine patches and gums.	22(14.7)	128(85.3)
Pharmacy management does not encourage counseling for varenicline.	20(13.3)	130(86.7)
Patients		
Low patient demand for counseling.	125(83.3)	25(16.7)
Consumers are always in a hurry.	107(71.3)	43(28.7)
Consumers do not trust pharmacists.	38(25.3)	112(74.7)

Table 7. Pharmacist's knowledge, attitude and practice mean scores about smoking cessation

Parameters	Mean* ±SD**	Min	Max	%
Knowledge				
Overall (All questions)	3.74±0.38	2.88	4.92	74.8
Gum	3.77±0.59	1.80	5	75.4
Patch	3.72±0.57	2.5	5	74.4
NRT	4±0.54	2.83	5	80.0

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Varenicline	3.51±0.50	2.86	4.71	70.2
Attitude				
Positive statements	3.87±0.43	2.47	4.87	77.4
Negative statements	3.18±0.66	1.20	5	63.6
Practice				
All questions	2.01±0.64	1	4.73	40.2
Assessing and advising patients	2.66±0.92	1	5	53.2
Assisting, referring and following up	1.75±0.60	1	4.57	35.0
Providing counseling	1.89±1.11	1	5	37.8

*Mean of the means for knowledge, attitude, and practice.
** SD: Standard deviation

Table 8. Categories of Knowledge and Practice mean scores of study participants (N= 150)

Mean Category	n (%)
Knowledge	
≤ 3.54	48(32.0)
3.54-3.83	54(36.0)
>3.83	48(32.0)
Practice	
≤ 1.73	53(35.3)
1.73-2.18	50(33.4)
>2.18	47(31.3)

*Knowledge: low (mean ≤ 3.54), moderate (mean 3.54-3.83), high (mean >3.83).

* Practice: low (mean ≤ 1.73), moderate (mean 1.73-2.18), high (mean >2.18).

Table 9. Relationship between Knowledge and social demographic characteristics

Variable	Level of Knowledge		
	Mean	SD	*P value
Age group (years)			
22-24	3.69	0.33	
25-27	3.78	0.36	0.019
28-31	3.87	0.39	
32+	3.60	0.40	
Gender			
Male	3.73	0.45	**0.896
Female	3.74	0.36	
Academic degree			
Bachelor	3.70	0.37	
PharmD	3.97	0.38	0.019
Master's degree	3.81	0.37	
Years of experience			
≤ 1	3.74	0.35	
1- <4	3.74	0.31	0.175
4-7	3.83	0.42	
≥ 8	3.64	0.42	
Years since graduation			
≤ 1	3.77	0.37	
1- ≤ 3	3.71	2.30	0.109
3 - 5	3.80	0.41	
6-11	3.84	0.38	
≥ 12	3.60	0.43	
Pharmacy description			
Independent	3.65	0.38	**0.000
Chain	3.89	0.33	
Time open to the public (hours)			
12	3.62	0.37	
16	3.77	0.37	0.016
24	3.95	0.41	
Your shift			
A	3.75	0.35	
B	3.77	0.43	0.310
A+B	3.63	0.30	
Pharmacy location			
Residential area	3.74	0.41	0.942
Near hospital	3.70	0.38	0.560
Near medical centre	3.70	0.33	0.120
Shopping area	3.72	0.35	0.565
Pharmacist tobacco use			
Smoker	3.87	0.50	**0.665
Never -smoker	3.73	0.37	
Total tobacco use			
Non-smoker	3.73	0.38	
Cig. only	3.79	0.53	0.956
Wp. only	3.75	0.29	
Both	3.67		
Pharmacists during shift			
1	3.72	0.37	**0.364
>1	3.79	3.40	
Assistants during shift			
0	3.73	0.36	
1	3.78	0.46	0.638
>1	3.60	0.46	
Number of adult's patients seen per day			
≤ 20	3.68	0.35	
21-35	3.72	0.43	0.579
36-50	3.78	0.40	
>50	3.78	0.34	
Attending educational program on smoking cessation			
Yes	3.89	0.25	**0.323
No	3.73	0.38	

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Consumers request support to quit smoking			
Very often	3.68	0.36	
Often	3.99	0.55	
Sometimes	3.80	0.32	0.084
Rarely	3.70	0.37	
Never	3.64	0.38	
Available smoking cessation products at the pharmacy			
None of them	3.53	0.37	
Gum only	3.69	0.35	
Patch only	3.68	0.35	0.000
Varenicline only	3.92	0.12	
Gum and Patch	3.94	0.45	
Gum and Varenicline	3.91	0.31	
All of them	4.13	0.31	

* ANOVA test
** T-test

Table 10. Relationship between pharmacists' positive attitude and socio-demographic characteristics

Variable	Positive attitude statements		
	Mean	SD	*P value
Age group (years)			
22-24	3.87	3.37	
25-27	3.83	0.43	0.228
28-31	3.80	0.45	
32+	4.00	0.48	
Gender			
Male	3.85	0.58	**0.716
Female	3.88	0.38	
Academic degree			
Bachelor	3.86	0.45	
PharmD	3.94	0.39	0.729
Master's degree	3.93	0.37	
Years of experience		0.36	
≤ 1	3.86	0.35	
1- <4	3.87	0.50	0.672
4-7	3.81	0.51	
≥ 8	3.94		
Years since graduation			
≤ 1	3.95	0.32	
1- ≤ 3	3.75	0.35	0.171
3 - 5	3.82	0.57	
6-11	3.88	0.39	
≥ 12	3.99	0.52	
Pharmacy description			
Independent	3.87	0.43	**0.945
Chain	3.87	0.44	
Time open to public (hours)			
12	3.90	0.49	
16	3.86	0.41	0.850
24	3.86	0.42	
Your shift			
A	3.86	0.40	0.911
B	3.89	0.46	
A+B	3.86	0.50	
Pharmacy location			
Residential area (yes)	3.79	0.44	0.037
(no)	3.94	0.42	
Near hospital (yes)	3.85	0.41	0.784
Near medical center (yes)	3.85	0.41	0.533
Shopping area (yes)	3.91	0.44	0.131
Pharmacist tobacco use			
Smoker	4.03	0.40	**0.181
Never -smoker	3.86	0.71	
Total tobacco use			
Non-smoker	3.86	0.38	
Cig. only	4.09	0.70	0.144
Wp. only	3.80	0.58	
Both	3.27	-----	
Pharmacists during shift			
1	3.87	0.47	**0.970
>1	3.87	0.27	
Assistants during shift			
0	3.86	0.43	
1	3.91	0.51	0.749
>1	3.97	0.28	
Number of adult's patients seen per day			
≤ 20	3.84	0.42	
21-35	3.88	0.43	0.954
36-50	3.89	0.43	
>50	3.88	0.49	
Attending educational program on smoking cessation			
Yes	4.09	0.30	**0.211
No	3.86	0.44	
Consumers request support to quit smoking			
Very often	4.03	0.48	
Often	4.08	0.57	0.095
Sometimes	3.85	0.29	
Rarely	3.89	0.43	
Never	3.66	0.54	
Available smoking cessation products at the pharmacy			
None of them	3.82	0.47	
Gum only	3.88	0.43	
Patch only	3.67	0.53	0.954
Varenicline only	3.88	0.00	
Gum and Patch	3.93	0.38	
Gum and Varenicline	3.92	0.38	
All of them	3.90	0.61	

*ANOVA test

** T-test

Table 11. Relationship between pharmacists' negative attitude and socio-demographic characteristics

Variable	Negative attitude statements		
	Mean	SD	*P value
Age group (years)			
22-24	3.17	0.79	
25-27	3.12	0.53	0.826
28-31	3.26	0.55	
32+	3.19	0.78	
Gender			
Male	3.26	0.78	**0.385
Female	3.15	0.62	

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Academic degree			
Bachelor	3.21	0.66	
PharmD	3.21	0.68	0.045
Master's degree	2.57	0.47	
Years of experience			
≤ 1	3.19	0.74	0.826
1- <4	3.15	0.59	
4-7	3.12	0.54	
≥ 8	3.25	0.79	
Years since graduation			
≤ 1	3.21	0.80	
1- ≤ 3	3.13	0.53	0.987
3 - 5	3.20	0.62	
6-11	3.20	0.59	
≥ 12	3.10	0.80	
Pharmacy description			
Independent	3.10	0.70	**0.057
Chain	3.31	0.57	
Time open to public (hours)			
12	3.14	0.74	0.870
16	3.19	0.64	
24	3.24	0.59	
Your shift			
A	3.19	0.65	0.416
B	3.24	0.69	
A+B	3.02	0.65	
Pharmacy location			
Residential area	3.07	0.58	0.081
Near hospital	3.19	0.78	0.860
Near medical center	3.13	0.61	0.365
Shopping area	3.23	0.70	0.262
Pharmacist tobacco use			
Smoker	3.45	1.06	**0.126
Never -smoker	3.15	0.61	
Total tobacco use			
Non-smoker	3.11	0.59	0.005
Cig. only	3.32	1.00	
Wp. only	3.50	0.70	
Both	5.00	…….	
Pharmacists during shift			
1	3.16	0.69	**0.604
>1	3.23	0.55	
Assistants during shift			
0	3.14	0.63	0.218
1	3.39	0.84	
>1	3.00	0.37	
Number of adult's patients seen per day	3.16	0.59	
≤ 20	3.32	0.67	0.260
21-35	3.03	0.73	
36-50	3.25	0.63	
>50			
Attending educational program on smoking cessation	3.43	0.46	**
Yes	3.17	0.67	0.336
No			
Consumers request support to quit smoking	2.80	1.17	
Very often	2.91	0.87	0.397
Often	3.15	0.59	
Sometimes	3.22	0.66	
Rarely	3.29	0.56	
Never			
Available smoking cessation products at the pharmacy			
None of them	3.12	0.66	
Gum only	3.24	0.66	
Patch only	3.47	1.33	0.809
Varenicline only	3.20	0.28	
Gum and Patch	3.08	0.62	
Gum and Varenicline	3.13	0.63	
All of them	2.93	0.72	

*****ANOVA test
**T-test

Table 12. Relationship between pharmacists' practice and social demographic characteristics

Variable	Practice level		
	Mean	SD	*P value
Age group (years)			
22-24	1.89	0.55	
25-27	1.90	0.50	0.084
28-31	2.23	0.64	
32+	2.05	0.83	
Gender			
Male	2.06	0.77	**0.553
Female	1.99	0.60	
Academic degree			
Bachelor	2.01	0.66	
PharmD	1.98	0.53	0.973
Master's degree	2.03	0.62	
Years of experience			
≤ 1	1.85	0.53	
1- <4	2.02	0.49	0.397
4-7	2.05	0.64	
≥ 8	2.11	0.85	
Years since graduation			
≤ 1	1.81	0.48	
1- ≤ 3	2.03	0.55	0.446
3 - 5	2.01	0.72	
6-11	2.09	0.54	
≥ 12	2.09	0.88	
Pharmacy description			
Independent	2.01	0.65	**0.921
Chain	2.00	0.63	
Time open to the public (hours)			
12	2.13	0.82	0.173
16	1.93	0.53	
24	2.15	0.56	
Your shift			
A	2.02	0.70	
B	2.01	0.61	0.967
A+B	1.92	0.50	

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Pharmacy location			
Residential area (yes)	1.88	0.53	0.028
(no)	2.11	0.71	
Near hospital (yes)	1.96	0.55	0.601
Near medical centre (yes)	1.90	0.51	0.051
Shopping area (yes)	2.08	0.69	0.085
Pharmacist tobacco use			
Smoker	2.17	0.61	**0.350
Never -smoker	1.99	0.95	
Total tobacco use			
Non-smoker	2.61	0.60	
Cigarettes only	2.25	0.94	0.210
Waterpipe only	1.82	0.622	
Both	1.18	------	
Pharmacists during shift			
1	1.97	0.62	**0.237
>1	2.12	0.69	
Assistants during shift			
0	1.93	0.54	0.001
1	2.46	0.93	
>1	1.87	0.57	
Number of adult's patients seen per day			
≤ 20	2.11	0.76	
21-35	1.97	0.70	0.081
36-50	2.11	0.56	
>50	1.77	0.40	
Attending educational program on smoking cessation	2.24	0.68	**0.363
Yes	2.00	0.64	
No			
Consumers request support to quit smoking	3.07	1.04	
Very often	2.07	0.61	0.001
Often	2.15	0.53	
Sometimes	1.95	0.63	
Rarely	1.71	0.56	
Never			
Available smoking cessation products at the pharmacy			
None of them	1.71	0.50	
Gum only	2.06	0.66	
Patch only	2.15	0.92	0.054
Varenicline only	2.09	1.16	
Gum and Patch	2.41	0.96	
Gum and Varenicline	2.09	0.45	
All of them	1.83	0.46	

*ANOVA test
**T-test

Relationship between pharmacists' attitude and socio-demographic characteristics

A significant association was identified between attitude towards the provision of SC services and pharmacists' academic degree and their total tobacco consumption (p=0.045 and 0.005, respectively). Pharmacy's location in a residential area was significantly associated with their pharmacists' positive attitude toward SC activities (p=0.037) (Table 10).

Pharmacists with bachelor or Pharm D degrees showed more of a negative attitude with regard to delivering SC services.

Table 13. Relationship between pharmacists' mean of knowledge, attitude and practice of smoking cessation activities

Parameter	Mean of Knowledge	Mean of Positive attitude	Mean of Negative attitude	Mean of Practice
Mean of Knowledge				
Pearson correlation	1	0.341	0.072	0.197
p-value		**0.000**	0.379	**0.016**
Mean of Positive attitude				
Pearson correlation	0.341	1	-0.141	0.407
p-value	**0.000**		0.086	**0.000**
Mean of Negative attitude				
Pearson correlation	0.072	-0.141	1	-0.041
p-value	0.379	0.086		0.614
Mean of Practice				
Person correlation	0.197	0.407	-0.041	1
p-value	**0.016**	**0.000**	0.614	

Moreover, pharmacists' who smoke tobacco or waterpipes showed a negative attitude toward the provision of SC services (Table 11).

Relationship between pharmacists' practice and social demographic characteristics

There is a significant association between pharmacists' practice of SC services and the number of assistants per shift, pharmacy location and the frequency of consumers' requesting support to quit smoking ($p < 0.05$). Pharmacists who have one or more assistants helping them during the shift showed more SC practice compared to those who were working solely (p=0.001). Also, the number of people who seek support to quit smoking was significantly associated with those practices where more SC services by offered by pharmacists (p=0.001) (Table 12).

Relationship between pharmacists' mean of knowledge, attitude and practice of SC activities

Analysis of data using Pearson' correlation co-efficient showed a statistically significant relationship between the knowledge scores and both positive attitude and practice scores ($p < 0.05$).

As the mean knowledge increases, the mean positive attitude towards SC services significantly increases. However, the mean negative attitude does not significantly change. As the mean positive attitude increases, the mean practice significantly increases. Changes in mean negative attitude were not associated with changes in knowledge, positive attitude or with practice (Table 13).

DISCUSSION

Jordan is heavily burdened with tobacco use in comparison to the rest of the Eastern Mediterranean Region as well as other parts of the world.[35] Smoking and tobacco use prevalence in Jordan exceeds 70% among adult males and 34% of boys (ages 13-15).[1,36] Waterpipe smoking has become popular among young people as a previous survey of students from four universities in Jordan showed that waterpipe smoking was as

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prevalent as cigarette smoking (30% and 56% respectively).[37]

These findings emphasize the lack of awareness of the negative consequences of tobacco and waterpipe smoking and illustrate the need to reach the public to be educated regarding the growing recognized health risks of tobacco smoking and the benefits of quitting.

Community pharmacists are in a unique position to reach out to the public due to their accessibility and the availability of SC products over the counter in pharmacies. Therefore, community pharmacists can play an essential role in the provision of SC services. Engaging community pharmacists in the SC process has been described in the literature.[22] Better smoking abstinence was previously reported by providing SC services that included one to one counselling or within-group sessions.[38]

In Jordan, data on the role of pharmacists in SC counselling, factors associated with these practices and barriers that hinder the delivery of these services are lacking.[39] In an attempt to address this and to increase community pharmacists' engagement in SC services and identify factors contributing to their involvement we conducted this study.

Looking into the pharmacists' knowledge of SC products, showed that almost one-third of pharmacists in our study had moderate knowledge of SC products in terms of use, available doses, side effects and contraindications. A study conducted in Malaysia showed around 45% of pharmacists had moderate knowledge in the treatment of tobacco dependence where the majority of participants responded correctly to items related to the use of NRTs with nicotine gums and patches.[32] In Poland, pharmacists' knowledge in selecting the proper dose and formulation of NRTs was assessed. They found only 2.7% of pharmacists correctly identified all four important elements in selecting the appropriate form of NRT.[40] However, in Australia, a study showed a clear gap in knowledge levels of Australian pharmacists, particularly in clinical expertise areas involving assessment of nicotine dependence, indications, dosages, adverse effects, contraindications, drug interactions and combinations of available pharmaceutical therapies.[41] Clearly, pharmacists' knowledge of SC therapies and methods needs real improvement. Moreover, pharmacists may have the knowledge and training needed for delivering medication-based SC recommendations, but their lack of knowledge of recent clinical guidelines may interfere with the effectiveness of their SC counselling.[42] A possible explanation for the low knowledge of pharmacists in SC services is that the topic of SC services is not introduced properly in their pharmacy schools' curricula.

A survey conducted in the USA found that there was insufficient time allocation and training materials for SC education among pharmacy graduates.[43] Also, there was not enough data about the depth and the scope of the content of smoking cessation in the Australian pharmacy curricula.[38] Pharmacy students enrolled in a survey in Poland reported that tobacco-related topics discussed as part of their curricula focus more on the "science" of tobacco and smoking relevant consequences rather than emphasizing the practical aspects of treating tobacco dependence.[40]

These findings emphasize the importance of continuous pharmacists' education and training in terms of SC services. Pharmacists' training has been shown to have a positive impact on their knowledge of SC services, confidence in delivering interventions, and intention to provide patients with proper counselling.[44-46] Also, knowledge and confidence (self-efficacy) in patients' counselling among pharmacists has significantly increased upon enrolment in a SC continuing professional education program. The program that was held in Wisconsin, USA, has proven its efficacy in enhancing pharmacists' knowledge as well as their confidence in the provision of SC counselling.[47]

In this study, pharmacists' knowledge of SC products was significantly associated with age, academic degree, pharmacy description, the opening time of pharmacy to the public, and availability of SC products in pharmacy. Pharmacists aged between 28 and 31 years appeared more knowledgeable of SC products. This can be attributed to the pharmacist increased knowledge through practical experience during long years of work. Fresh graduates and younger pharmacists may have not received enough education and training on this topic. This is in line with those found in previous research from elsewhere.[48,49]

PharmDs graduates were found to be more knowledgeable about SC products. PharmD graduates who completed 6 years of undergraduate course compared to pharmacists who complete 5 years one. In the sixth year of PharmD program students spend practical time in community and hospital pharmacies as well as rotations via different medical specialities. This exposes PharmD graduates to various clinical fields including SC products unlike pharmacy graduates.[50]

In this study, pharmacists who work in pharmacy chains showed better knowledge of SC products. In Jordan, major pharmacy chains embrace pharmaceutical care and are eager to update their employers through continuing training programs which can explain the chains' pharmacists' superior knowledge.[50] Furthermore, pharmacists who work in pharmacies open 24 hours to the public may encounter more variety of customers that explain their better knowledge of different products.

Nicotine gums and nicotine patches were the commonest SC products available at pharmacies. This can explain the better pharmacists' knowledge of these products. Also, pharmacists might be asked more frequently about gums and patches because they are less expensive compared to Varenicline (Champix) which make them more affordable.

The attitudes of our respondents toward SC services were encouraging since the majority showed an overall positive attitude (mean score=3.87). 80% of pharmacists agreed/strongly agreed that pharmacists have a responsibility to advise patients on quitting smoking and should receive the relevant training to help them assist patients who intend to quit smoking. These findings are comparable to those found among health care providers in China where 88% of participants agreed/strongly agreed that health care providers should be involved in tobacco control.[51] Other studies reported

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that pharmacists were in favour of being responsible to provide SC services and showed a positive attitude towards their role in SC role as healthcare providers.[38,52]

More than half of our pharmacists showed confidence in providing patients with SC counselling effectively. This finding is similar to surveys of community pharmacists in Poland, Thailand and the United States.[34,40,43]

In Jordan, it has been previously been reported that 46.7% of Jordanian physicians were smokers and a high percentage (81%) of them smoked in front of their patients.[53,54] Several studies had highlighted that patients are more successfully willing to quit smoking if their healthcare providers are non-smokers, it is important to assess attitudes and smoking habits of medical professionals due to their essential role in the SC process as advisers and behavioural models for their patients.[55]

Several SC guidelines recommend that healthcare professionals identify and record their patients' smoking status.[56-58] The identification of patients' smoking status is vital in the provision of SC counselling since it determines whether a smoker needs any SC interventions.[57,59] However, only 24.6% of our pharmacists stated that they always/ usually ask about their patients' smoking status and therefore, a large number of smoking patients may remain unidentified. In Nigeria, only 49.6% of pharmacists had ever inquired about patients' smoking status.[60] Similar findings were reported in Montana, USA.[61] In contrast, in Poland, the majority (86%) of community pharmacists inquired about their patients' smoking status of their patients.[40] The pharmacists' failure to routinely establish and document their patient's smoking status contributes to being missed opportunities in the provision of SC interventions by the community pharmacies in Jordan.

Furthermore, despite the identification of patients who smoke, some may still not receive any advice to quit as suggested by pharmacists (34%) who stated that they seldom/never routinely advise their patients to quit smoking. The mean score of practice was also low (2.01). Comparable results were reported in Texas, USA, where low levels of pharmacist involvement in SC was observed.[26] Pharmacists' low level of knowledge, skills and confidence may contribute to the sub-optimal practice in providing counselling to patients to quit smoking. This emphasizes the importance of continuing education training programs for community pharmacists which can enhance their practices in the counselling and advising of patients with their smoking cessation process.

These findings were different to those found in Malaysia where only 8.3% of pharmacists rarely/never advise their patients.[32] Also, in Poland, where the majority of pharmacists showed significant involvement in SC services through providing both counselling and dispensing of NRTs to their patients.[40]

The presence of one assistant during the work shift appeared to enhance pharmacists' practice by overcoming time barriers by helping identify and recording patients' smoking status while collecting other relevant patient information needed for the prescription dispensing process.[22]

Pharmacists working in residential areas appeared to have more practice of SC activities. This could be attributed to having regular customers who tend to visit these pharmacies regularly and have a previous relationship with the pharmacist on duty so they can be more open toward receiving counselling and better communication with their local pharmacist.

Most of our pharmacists perceived insufficient training, inadequate knowledge about drug therapy for SC and the lack of information materials on SC as the main barriers to the provision of SC interventions. This is supported by the fact that 96% of pharmacists surveyed had never received any formal training regarding SC. Similar results were observed in Nigeria and Malaysia and USA.[32,60,61]

Training of health care providers on SC has been found to improve health care providers' level of knowledge, confidence, and practices of SC services.[62] However, almost three-quarters of pharmacists in our study agreed/strongly agreed on patients' unwillingness to quit smoking may affect their attitudes toward providing SC counselling negatively. This is to a national survey of US professionals and health care providers who were less likely to advise patients who are unwilling in receiving SC counselling.[63]

The Lack of reimbursement may contribute to some of our pharmacists' negative attitudes in providing SC services. Around 70% of pharmacists agreed/strongly agreed that there is not sufficient economic reward for pharmacists in advising about quitting smoking. Similar findings were reported from Nigeria.[60] This highlight the importance of reimbursement of healthcare providers for the delivery of effective SC services and the inclusion of these services in their duties.

In our study, the pharmacy location was highly correlated with the pharmacists' positive attitude toward SC activities (p value< 0.05). Pharmacists working in pharmacies located in residential areas showed a more positive attitude toward these services. Surprisingly, pharmacists' negative attitude levels toward SC services, was associated with their academic degree. Furthermore, negative attitudes were highly associated with those pharmacists who smoke both cigarettes and waterpipes ($p<0.05$). This is not surprising, since pharmacist who smokes will find difficulty to advise and convince patients to quit smoking. It was previously reported that non-smokers pharmacists showed more positive attitudes toward SC services.[38]

The lack of cessation programs and support from organizations concerned with SC were also perceived as barriers by pharmacists. It was previously reported by a study in Jordan that many people were unaware of SC clinics and only 2.4% of smokers had ever utilized them.[64] This lack of knowledge of these facilities could be due to the existence of only 2 clinics in the capital and unfortunately lacks sufficient funding.[64]

The lack of patients' demand was also perceived by pharmacists as a main barrier in providing counselling. This is consistent with what was found in Malaysia where the majority of pharmacists (71.8%) perceived lack of patient demand as a limiting factor for cessation activities in community pharmacy.[32] The lack of patients' awareness that pharmacists provide SC counselling

along their traditional dispensing activities may explain the lack of patient demand.[22] In the United Kingdom (UK), the integration of community pharmacy services and public health programs has facilitated a 44% engagement of community pharmacists in providing smoking SC services.[65]

The lack of reimbursement was reported as the main barrier perceived by community pharmacists.[31,60] In Canada for instance, pharmacists agreed that pharmacists get a little economic incentive to advise patients to quit smoking.[31]

All previously mentioned barriers should be addressed in a national program aiming to increase pharmacists' contribution and involvement in SC activities.

LIMITATIONS OF THE STUDY

The study sample was small and focused on community pharmacists in a provisional city and cannot be generalized to all pharmacists in the country. Knowledge of SC was also limited to medication-related information, as the study did not assess knowledge of behavioural elements of tobacco dependence counselling. The study tool used to collect data is not standardized. The survey did not include an assessment for other tobacco consumption such as waterpipe cessation.

CONCLUSION

Our study showed a moderate level of knowledge regarding SC products. Overall, pharmacists showed a positive attitude toward providing SC services. The practice of pharmacists involving SC services appeared to be low. The lack of educational materials, low patients' demand, pharmacist knowledge deficits, the need for more training of pharmacists, lack of financial incentive for pharmacists and the lack of SC programs have been identified as barriers that hinder the provisions of SC services.

RECOMMENDATIONS

To address the training needs for community pharmacists on SC intervention methods and techniques in addition to nicotine dependence and withdrawal symptoms, the Association of Pharmacists along with the Ministry of Health and in conjunction with educational institutions should develop and implement a pre and post service standard curriculum for pharmacists' training in this regard. National guidelines for tobacco dependence, documentation and treatment should be developed, implemented and monitored by the Ministry of health and other health management teams. A system of reimbursement of pharmacists for delivering effective SC interventions should be developed and implemented to encourage more engagement of pharmacists in the process of SC.SC clinics and facilities should be expanded and integrated with community pharmacies, or a close liaison established between them. Future studies should consider pharmacists who work in world health organizations (WHO), universities and government sectors. Also, compare the level of knowledge, attitude, practice and perceived barriers between them and pharmacists who work in community pharmacies. We should focus more on the relation between knowledge, attitude, practice, and perceived barriers in waterpipe smokers and include them in any smoking SC program. The integration of community pharmacy services and public health programs will facilitate the engagement of community pharmacists in providing smoking SC services.

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CONFLICTS OF INTEREST

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Appendix B

Part one: Nicotine gum which assessed knowledge of:

1. Available dosage
2. Chewing method
3. Food and drink considerations
4. Taste of nicotine gum
5. Side effects

Part two: Nicotine patch which assessed knowledge of:

1. Available dosage
2. Method of administration
3. Special precautions
4. Side effects
5. Duration of action

Part three: Nicotine Replacement Therapy (NRT)which assessed knowledge of:

1. NRT in patients with cardiovascular diseases
2. NRT in patients with gastrointestinal disorders
3. NRT selection based on total number of cigarettes/day and time of first cigarette upon waking up
4. NRT selection based on total number of waterpipe heads/day
5. Effectiveness in water pipe users

Part four: Varenicline (Champixâ) which assessed knowledge of:

1. Available dosage
2. Food and drink consideration
3. Special population (example: patients with Diabetes Mellitus)
4. Side effects
5. Duration of treatment and discontinuation of medication
6. Effectiveness in water pipe users

Table A1. Part One: Smoking Cessation Knowledge

Statements	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Cessation products Knowledge How much do you agree with the following statements?					
Gum					
1. Nicotine gums available in 2mg and 4mg dosage.					
2. Nicotine gum is not chewed like a regular gum.					
3. Patients using nicotine gum should not eat or drink 15 minutes before and during use.					
4. Taste of nicotine gum may be unpleasant at start, but patients are advised to continue use.					
5. Some side effects for nicotine gum are: mouth soreness, dyspepsia and jaw ache.					
Patch					
6. The 16-hour patch is available in 10mg, 15mg, 25mg dosage.					
7. Patch should be rotated and not put on the same site on consecutive days.					
8. Patch should be applied to clean, dry intact area of hairless skin (upper arm, back, shoulder).					
9. The side effects of the patch are: dizziness, headache and gastrointestinal discomfort.					
10. Nicotine patches are long acting Nicotine Replacement Therapy (NRT).					
11. The patch has a slower onset of delivery than NRTs.					

Nicotine Replacement Therapies (NRT; Gum and Patch) **Waterpipe (Arghile)**					
12. In stable cardiovascular disease patients, using NRT presents a lesser hazard than continuing to smoke.					
13. Use NRT *with care* in patients with gastritis, peptic ulcers, and esophagitis.					
14. The period from waking up to first cigarette should be considered in selection of NRT form.					
15. Number of cigarettes smoked daily should be considered in selection of NRT dose.					
16. Number of waterpipe heads should be considered in selection of NRT dose.					
17. NRT can be used to help waterpipe smokers to quit.					
Varenicline (Champix)					
18. Varenicline is available as 0.5 and 1 mg.					
19. Varenicline must be taken with food and full glass of water to minimize nausea.					
20. Patients with diabetes mellitus should be advised to monitor their blood sugar levels more closely when using varenicline.					
21. The common adverse effect for using varenicline are: nausea, constipation and flatulence.					
22. Varenicline may be stopped abruptly, no need for taper.					
23. Varenicline should be used for 3 months to get the desired effect.					
24. Varenicline can be used to help waterpipe smokers to quit.					

Frequency consumers request support to quit smoking:

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Very often

Table A2. Part Two: Smoking Cessation Attitude

Statements **(How much do you agree with the following?)**	**Strongly agree**	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
1. Most smokers can quit if they really want to.					
2. The majority of smokers want to quit.					
3. With most smokers, pharmacists can be effective in promoting smoking cessation.					
4. Patients appreciate it when I provide smoking cessation advice.					
5. When a person has been smoking for many years there is always a point in helping him or her to quit					
6. Pharmacists have a responsibility to advise patients to quit smoking.					
7. Even if a patient's illness is unrelated to smoking, pharmacists should offer smoking cessation advice.					
8. Pharmacists should receive relevant training to assist patients who want to stop smoking.					
9. It is important for me as pharmacist to ask patients if they smoke.					
10. I am confident that I can offer smoking cessation services effectively.					
11. NRT (patch, gum, etc.) improves smokers' chance of quitting.					
12. Varenicline improve smokers' chance of quitting.					
13. Tobacco use can be treated successfully using pharmacotherapy and counseling.					
14. Waterpipe users need cessation therapy to quit smoking.					
15. Tobacco use is an addiction.					
16. Talking with smokers about quitting will discourage their return as customers.					
17. Most patients don't want unsolicited (desirable) advice from their pharmacist.					

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18.	Counseling for cessation is not an efficient use of my time.					
19.	If a patient can't quit using tobacco on his own, there is little that I can do.					
20.	There is not much economic incentive (reward) for pharmacists in advising about quitting smoking.					

Table A3. Part Three: Smoking Cessation Practice

In the past month of practice, how frequent did you perform the following?	**Always**	**Usually**	**Sometimes**	**Seldom**	**Never**
1. Asked patients about their smoking status.					
2. Advised patients to quit smoking.					
3. Advised patients on the use of gum or patch to quit smoking.					
4. Advised patients on the use of varenicline to quit smoking.					
5. Assessed patients' readiness to quit smoking.					
6. Assisted patients in quitting by counseling them on behavioral techniques for quitting.					
7. Assisted patients in quitting by giving them educational materials related to quitting smoking.					
8. Arranged follow up with patients to assess their progress in quitting smoking.					
9. Referred smokers to doctors in smoking cessation clinics.					
10. Referred smokers to non-doctors (e.g., alternative therapies as acupuncture).					
11. Provided patients or family members with smoking cessation counseling.					

Have you ever attended an educational program on smoking cessation? ☐ Yes ☐ No

12. Which of these products are available in the pharmacy? ☐ Gum ☐ Patch ☐ varenicline

Table A4. Part Four: Barriers to performing smoking cessation activities

Barriers		**Yes**	**No**
1.	I do not know enough about drug therapy for smoking cessation to assist patients to quit.		
2.	It is difficult to recognize patients who smoke or use tobacco products.		
3.	I do not feel comfortable asking patients if they smoke or use tobacco products.		
4.	I need more training on how to use nicotine gums and patches.		
5.	I need more training on how to use varenicline to help smokers to quit.		
6.	I dislike counseling patients for tobacco cessation.		
7.	I am too busy due to large workload.		
8.	The pharmacy lacks adequate staff.		
9.	I lack support from organizations concerned with smoking cessation.		
10.	I lack smoking cessation educational materials.		
11.	Lack of Cessation programs.		
12.	I Lack private area for counseling.		
13.	Unavailability of NRT.		
14.	Unavailability of varenicline.		
15.	Consumers do not trust pharmacists.		
16.	Consumers always in a hurry.		
17.	Low patient demand for counseling.		
18.	Pharmacy management does not encourage counseling for OTC nicotine patches and gums.		
19.	Pharmacy management does not encourage counseling for varenicline.		