



Effect of training program regarding smoking cessation counseling for primary health care physicians in Port Said City, Egypt

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Abstract

Background Smoking is a major risk factor for death-related diseases. Not all healthcare professionals are following evidence-based guidelines for smoking cessation counseling in primary care settings. The WHO, Framework Convention on Tobacco Control (FCTC), and United States Public Health Service (USPHS) guidelines recommend that all healthcare professionals, including students in healthcare training programs, receive education in the management of tobacco use and dependence.

Objective To evaluate the effect of training programs for primary healthcare physicians on the knowledge, attitude, and practice of smoking cessation counseling.

Methods This was a pre-post intervention study. The study included 74 primary care physicians working in primary healthcare centers affiliated with the Ministry of Health and Suez Canal University Hospitals in Port Said City. The study was conducted between June 2015 and March 2016 using a structured questionnaire and observation checklist to assess counseling of patients willing to quit smoking.

Results There were highly statistically significant improvements in the physicians' median scores of knowledge (30%–80%), attitude (65%–100%), and practice (20%–70%) ($p < 0.001$) pre-post intervention. The most frequent correct knowledge was consequences of smoking (73%–87.3%) ($p < 0.001$) pre-post intervention. The most favorable attitude was the importance of smoking cessation (70.3%–100%) ($p < 0.001$) pre-post intervention. The best observed correct practice was asking about smoking (70.3%–100%) ($p < 0.001$) pre-post intervention.

Conclusion Knowledge, attitude, and practice skills regarding smoking cessation counseling among primary healthcare physicians were markedly improved after implementation of the education program.

Keywords Cessation · Counseling · Smoking · Tobacco

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Introduction

Data from the Egyptian Demographic and Health Survey 2015 (DHS 2015) revealed that current cigarette or other tobacco product smoking among adults between 15 and 59 years was 20.9%, with a significant difference between males (46.4%) and females (0.2%) (DHS 2015; WHO 2017). In 2014, 4.8% of youth aged between 13 and 15 years was currently smoking cigarettes (boys 8.3%; girls 0.8%), and 13.6% of youth currently used tobacco products (boys 18.1%; girls 8.2%) (WHO 2017; GYTS 2014).

Over 50,000 people die annually in Egypt from tobacco-related diseases (Egypt: Tobacco Burden Facts 2005). The major causes of death among smokers are diseases related to smoking, including cancer and respiratory and vascular

diseases (CDC 2016). The harmful effects of tobacco use are not limited to smokers but may affect other individuals who are exposed to second-hand smoke (DHS 2015). The direct annual cost of treating tobacco-related diseases in Egypt was estimated at US\$ 650 million. Nearly half of all tobacco-related deaths occur during the productive period between 30 and 69 years (Egypt: Tobacco Burden Facts 2005).

Interventions aiming to quit smoking are the quickest approach to reduce tobacco-related morbidity, mortality, and healthcare costs (CDC 2014). The US Preventive Services Task Force (US PSTF) recommends that clinicians should ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions with the recommendation to use the "5 As" (ask about tobacco use, advise to quit, assess willingness to quit, assist to quit, and arrange follow-up and support) technique of counseling. The US Food and Drug Administration-approved pharmacotherapies for tobacco cessation in adults are nicotine replacement therapy, bupropion, and varenicline (US PSTF 2016).

The smoking cessation clinic started working with the smoking control program on May 6, 2012, for 2 days a week at the National Research Center (Saad-Hussein 2012). Other clinics in Egypt were in private hospitals. Egypt also included a toll-free quit line number on all cigarette packs (WHO 2015). A previous study revealed that despite favorable attitudes of family physicians about cessation counseling, there was inadequate practice, and training was recommended (Eldein 2013). Egyptian medical students in the Global Health Professions Student Survey thought that health professionals should receive specific training on cessation techniques (GHPSS 2005). The previous findings, with few smoking cessation counseling training intervention studies in Egypt, showed the need to conduct the present study. The objective was to evaluate the effect of a training program for primary healthcare physicians on the knowledge, attitude, and practice of smoking cessation counseling.

Hypothesis An alternate hypothesis was that conducting a smoking cessation counseling program for primary care physicians will lead to changes in their pre-post intervention knowledge, attitude, and practice.

The null hypothesis was that conducting a smoking cessation counseling program for primary care physicians will lead to no difference in their pre-post intervention knowledge, attitude, and practice.

Methods

Study design and time This was a quasi-experimental pre-post intervention. It was conducted between June 2015 and March 2016.

Study setting This study was performed in 14 urban primary healthcare (PHC) centers, Port Said City. Two of them were family medicine (FM) centers affiliated with Suez Canal University, and the other 12 centers were affiliated with the Ministry of Health.

Study sample A comprehensive sample of 80 primary care physicians was recruited to participate in the program; they were working in PHC and FM centers. This included all residents with bachelor, diploma, fellowship, master, and doctorate degrees. Physicians excluded from the study were those involved in a similar program in the past or during the current study.

Instruments

1. Questionnaire

Data were collected using a structured self-report questionnaire. The questionnaire included 30 multiple-choice questions to assess the knowledge of physicians regarding smoking, smoking hazards, counseling importance and models, evidence-based recommended pharmacotherapy, indications, contraindications, and side effects. The correct answer was given one point with an average total knowledge score multiplied by 100. Also, the questionnaire was used to assess the attitude of physicians regarding smoking cessation counseling, including five items about the importance of counseling and readiness to practice it. The participants were given choices scored on a 5-point Likert scale, from strongly disagree with 1 to strongly agree with 5 points, with the average scores multiplied by 100. The individual attitude items were further categorized as favorable for agree and strongly agree and unfavorable for the other responses.

2. Observation checklist

The practice of smoking cessation counseling by each physician in an encounter with a patient willing to quit smoking was assessed. This included ten items based on the "5-A" technique (ask, advise, assess, assist, arrange). The choices were: always, 2; sometimes, 1; never, 0, with an average score multiplied by 100. The individual practice items were further categorized as correct for always and not for sometimes/never.

The questionnaire and checklist were constructed by the researcher according to the literature and guidelines for smoking cessation counseling (Searight 2009; WHO 2014; Treating tobacco use and dependence: 2008; Patel et al. 2010; Bader et al. 2009; Talia et al. 2016). They were evaluated for content validity by five experts in the family medicine and community medicine departments. A pilot study was conducted on a sample of 20 physicians before conducting the study to test the clarity, applicability, and reliability of the study tools, which were acceptable (0.75).

Intervention The education program was designed by the first researcher. The content of the program was based on the literature and guidelines (Searight 2009; WHO 2014; Treating tobacco use and dependence: 2008; Patel et al. 2010; Bader et al. 2009; Talia et al. 2016): first session: tobacco smoking background and tobacco control in Egypt; second session: importance of the cessation program, assessment of tobacco use status, and models of smoking cessation counseling: 5-A (ask: identify all tobacco users at every visit; assess: determine readiness to quit; advise: advise all tobacco users that they need to quit; assist: help the patient with a quit plan; arrange: schedule follow-up or a referral) techniques with patients willing to quit smoking or the 5-R (relevance: use motivational relevance to the patient; risks: identify the negative consequences of tobacco use; rewards: identify the potential benefits of stopping tobacco use; roadblocks: identify barriers to quit smoking and provide appropriate treatment; repetition: repeat assessment of readiness to quit) technique with patients who are not willing to quit and tailoring pharmacotherapy to stop smoking. The transtheoretical model assumes that health behavior changes in stages tailoring interventions to a patient's stage: the pre-contemplation stage: current smokers who are not seriously considering quitting within the following 6 months; contemplation stage: current smokers who are seriously considering quitting within the subsequent 6 months, but not within the next month, and have not made a 1-day quit attempt in the past year; preparation stage: current smokers who are seriously considering quitting within the next month and have made a 1-day attempt in the past 12 months; action stage: ex-smokers who have achieved total abstinence from 1 day to 6 months; maintenance stage: ex-smokers who have achieved total abstinence for 6 months or more. During precontemplation and contemplation, patients are more likely to respond to a cognitive approach, such as discussing the benefits of habit change, possibly supported by written information. In the preparation stage, the patient chooses a starting date and strategy for change. During action and maintenance, brief lapses or more enduring relapses are expected.

Third session: practical session on the application of the 5-A counseling technique and transtheoretical model for patients willing to quit smoking within 10 min of role play.

The intervention was delivered by the first author in primary care settings. The number of attendants at each session was (5–10) physicians. The average time of each session was 90–120 min. Appropriate teaching methods were interactive lectures, role play, and assignments. Appropriate visual aids were showing data and flip charts. Compliance of participants was enhanced by supplying them with a booklet of the educational materials checklists. Post-intervention results were evaluated after 6 months of program implementation.

Primary outcome measures Knowledge, attitude, and practice of primary healthcare physicians regarding smoking cessation counseling.

Statistical analysis: Data were analyzed using Social Package of the Social Sciences (SPSS) version 22. Data were tested for normality using the Shapiro-Wilk test. Descriptive statistics: Categorical data were presented in frequency and percentage with continuous data in mean and standard deviation. Inferential statistics: Wilcoxon signed-rank test was used to compare the median of the total knowledge, attitude, and practice scores at the pre- and post-test assessments. McNamara's test was used to compare the individual response to the knowledge, attitude, and practice pre-post intervention. $P < 0.05$ was considered significant.

Results

Primary healthcare physicians' socio-demographics characteristics

Seventy-four primary care physicians completed the intervention with a response rate 92.5%. Most of the participants were females (87.8%) with affiliation to the MOH (86.5%). The majority of the participants were non-smokers (94.6%). Two thirds of participants had no postgraduate certificate (66.2%) and had less than 5 years of practice (62.2%). The most frequent rate of smokers seen by physicians was ≤ 20 patients/week (79.7%) as shown in Table 1.

Pre-post changes in knowledge, attitude, and practice

As shown in Table 2, there was a highly statistically significant improvement in primary healthcare physicians' knowledge, attitude, and practice scores ($p < 0.001$) after attending the smoking cessation counseling training program.

The most frequent correct knowledge responses in the pre-intervention stage with further improvement of the correct answers in the post-intervention stage were for the consequences of cigarette smoking (73% vs. 87.3%), factors of successful smoking cessation (51.4% vs. 94.6%), and risk factors of smoking (43.2% vs. 78.4%), and smoking was the modifiable risk factors for all causes of morbidity and mortality (41.9% vs. 73.0%) ($p < 0.001$). The least knowledge responses in the pre-intervention showed significant improvement of the correct answers in the post-intervention importance of the 5-A approach: (2.7% vs. 93.2%) and that bupropion can be used in combination with nicotine supplements (5.4% vs. 55.4%) (Table 3).

Table 1 Baseline characteristics of the study sample ($n = 74$)

Socio-demographic and work characteristics		n(%)
Gender	Male	9 (12.2)
	Female	65 (87.8)
Age groups in years	≤ 25	23 (31.1)
	26–30	28 (37.8)
	≥ 31	23 (31.1)
Degree	Bachelor	49 (66.2)
	Diploma	15 (20.3)
	Master	8 (10.8)
	Medical Doctorate	1 (1.4)
	Fellowship	1 (1.4)
Years of practice	< 5	46 (62.2)
	≥ 5	28 (37.8)
Primary care center	University	10 (13.5)
	MOH	64 (86.5)
Smoking status of physician	Never smoker	70 (94.6)
	Former/ex-smoker	2 (2.7)
	Current smoker	2 (2.7)
Smokers seen weekly	< 20	59 (79.7)
	≥ 21	15 (20.3)

MOH, Ministry of Health; SD, standard deviation

Most of the physicians had the favorable attitude that smoking cessation is important with significant improvement pre-post intervention (70.3% vs. 100%) ($p < 0.001$). The lowest favorable attitude response was readiness of the physicians to counsel about smoking cessation in PHC with significant improvement in the pre-post intervention (44.6% vs. 97.3%) ($p < 0.001$) (Table 4).

The majority of practice items improved significantly ($p < 0.001$) except referral that was not practiced either pre- or post-intervention. The least practiced items in the pre-intervention were use of stop smoking posters/educational materials for Advise: (0% vs. 100%), discussion of the use of pharmacotherapy with smokers for Assist: (0% vs. 58.1%), and using resources such as religion and regulations for advice to quit smoking in Assist: (0% vs. 31.1%) with significant improvement in the post-intervention phase (4.1% vs. 40.5%) ($p < 0.001$) (Table 5).

Discussion

The current study revealed highly significant improvement in primary care physicians' knowledge, attitude, and practice scores from pre- to post-implementation of a training program regarding smoking cessation counseling with acceptance of the alternative hypothesis.

The significant improvement in total knowledge scores was consistent with a previous study by Labib et al. (2012) conducted among internal medicine residents at Cairo University Hospitals, Egypt. Also, another study by Guo et al. (2010) in Taiwan showed significant improvement in knowledge scores of trainees from different specialties, explaining their lack of knowledge in the pre-intervention by no previous courses on teaching smoking cessation in their medical schools along with few continuing medical education courses related to this issue.

However, the study by Strayer et al. (2013) found that overall smoking cessation knowledge was unchanged after the intervention. The difference might be explained by using different tools as they used a clinical decision support tool software in practice.

The current study showed significant improvement in both the total knowledge score and all knowledge items. The knowledge items were different from those in the Labib et al. (2012) study, which showed significant improvement in similar items and other different knowledge items related to the techniques of counseling, follow-up visits after setting a quit date, 5-R motivational interventions, and coping skills to handle the withdrawal symptoms.

The study by Herold et al. (2016) regarding counseling training of medical students revealed that knowledge increased during teaching and remained favorable after 6 months (e.g., the 5-A technique and forms of NRT). There was no significant improvement for some knowledge subitems, which they explained as this initial knowledge was satisfactory even before the intervention, with a significant decrease in knowledge for some items, which could be related to inappropriate recall.

The current study revealed improvement in most of the practice items, which could be explained by the participants' favorable attitude. These results were consistent with the study by Prokhorov et al. (2010) in Texas, which found significant

Table 2 Comparison between physicians' pre-post intervention knowledge, attitude, and practice scores ($n = 74$)

	Pre Median (IQR)	Post Median (IQR)	Wilcoxon signed- rank test (Z)	P value
Knowledge score	30.0(20.0–36.7)	80.0(73.3–86.6)	−7.483	< 0.001*
Attitude score	65.0(50.0–75.0)	100.0(95.0–100)	−7.484	< 0.001*
Practice score	20.0(13.8–30.0)	70.0(65.0–76.3)	−7.487	< 0.001*

IQR, Interquartile range

*Statistically significant at $p < 0.05$

Table 3 Pre-post changes in knowledge items among the study sample (n = 74)

Knowledge items	Correct knowledge		McNemar's test P value
	Pre n(%)	Post n(%)	
Prevalence of smoking in Egypt	14 (18.9)	52 (70.3)	< 0.001*
Percentage of deaths from coronary artery diseases	15 (20.3)	58 (78.4)	< 0.001*
Diseases linked to smoking	54 (73.0)	72 (97.3)	< 0.001*
Effect of passive smoking	22 (29.7)	65 (87.8)	< 0.001*
Risk factors of smoking	32 (43.2)	58 (78.4)	< 0.001*
Smoking as a modifiable risk factor of morbidity	31 (41.9)	54 (73.0)	< 0.001*
Factors of a successful smoking cessation program	38 (51.4)	70 (94.6)	< 0.001*
Successful smoking cessation methods	28 (37.8)	68 (91.9)	< 0.001*
Combination of interventions	17 (23.0)	68 (91.9)	< 0.001*
Possibility of relapse after cessation	18 (24.3)	59 (79.7)	< 0.001*
Rationale of counseling	13 (17.6)	63 (85.1)	< 0.001*
Importance of 5-A approach	2 (2.7)	69 (93.2)	< 0.001*
5 As: physician role in assess	26 (35.1)	64 (86.5)	< 0.001*
Advise: risks	20 (27.0)	52 (70.3)	< 0.001*
Advise: benefits	9 (12.2)	52 (70.3)	< 0.001*
Transtheoretical model: physician's intervention	21 (28.4)	63 (85.1)	< 0.001*
Transtheoretical model: patients situation	24 (32.4)	63 (85.1)	< 0.001*
Indications of behavioral modification	25 (33.8)	64 (86.5)	< 0.001*
Benefit of adding pharmacotherapy with counseling	23 (31.1)	54 (73.0)	< 0.001*
Recent evidence of pharmacotherapy	25 (33.8)	65 (87.8)	< 0.001*
First-line pharmacotherapy	41 (55.4)	60 (81.1)	0.002*
Pharmacotherapy during pregnancy	15 (20.3)	57 (77.0)	< 0.001*
Combination of NRT forms	21 (28.4)	61 (82.4)	< 0.001*
Selection of pharmacotherapy with failed attempts	17 (23.0)	50 (67.6)	< 0.001*
Selection of medications with psychiatric disorder	13 (17.6)	54 (73.0)	< 0.001*
Selection of combination of bupropion + NRT	4 (5.4)	41 (55.4)	< 0.001*
Precautions when using bupropion	10 (13.5)	59 (79.7)	< 0.001*
Side effects of varenicline	15 (20.3)	57 (77.0)	< 0.001*
Smoking cessation clinics in Egypt	20 (27.0)	55 (74.3)	< 0.001*
Quit line in Egypt	14 (18.9)	50 (67.6)	< 0.001*

NRT, Nicotine replacement therapy; *statistically significant at p < 0.05

Table 4 Pre-post changes in attitude items among the study sample (n = 74)

Attitude items	Correct answer		McNemar's test P value
	Pre n(%)	Post n(%)	
Smoking cessation counseling is important	52 (70.3)	74 (100)	< 0.001*
Ready to counsel about smoking cessation	33 (44.6)	72 (97.3)	< 0.001*
Chances of quitting are increased if the physician advises smokers to quit	37 (50.0)	73 (98.6)	< 0.001*
Physician should routinely ask about patients' smoking habits	48 (64.9)	73 (98.6)	< 0.001*
Physician should routinely advise their patients to quit smoking	43 (58.1)	73 (98.6)	< 0.001*

*Statistically significant at p < 0.05

Table 5 Pre-post change in practice items among the study sample (n = 74)

Practice items 1.1.	Correct practice		McNemar's test P value
	Pre n(%)	Post n(%)	
Ask all new clients about smoking habits	52 (70.3)	74 (100)	< 0.001*
Routinely records smoking status	7 (9.5)	66 (89.2)	< 0.001*
Advise: benefits of smoking cessation	35 (47.3)	70 (94.6)	< 0.001*
Advise: hazards of smoking	15 (20.3)	60 (81.1)	< 0.001*
Advise: use of educational materials	0 (0)	74 (100)	< 0.001*
Assess smokers giving up	3 (4.1)	49 (66.2)	< 0.001*
Assist: use of pharmacotherapy	0 (0)	43 (58.1)	< 0.001*
Assist: use of resources	0 (0)	23 (31.1)	< 0.001*
Arrange: follow-up	3 (4.1)	30 (40.5)	< 0.001*
Refer: to other services	0 (0)	0 (0)	NA

*Statistically significant at $p < 0.05$

and lasting improvement in practicing 5-A techniques after 12-month training in smoking cessation counseling among physicians concerning the patient-reported effect of the physician training on the practices: for asking about a smoking increase, in the assessment of readiness to quit, and in arranging patient follow-up. The study by Guo et al. (2010) measured the practice in the form of adherence to the 5-A guideline and found that the best results in descending order were advice (88%), ask (86%), assess (76%), arrange (60%), and assist (59%). Also, Strayer et al. (2013) found that performance on the summed 5-A technique behaviors was improved after the intervention. The improvement was in advising smokers to quit smoking, and there was a nonsignificant increase in assisting smokers with quitting.

The pre-test results of the present study were lower than in previous cross-sectional studies such as the Egyptian study by Eldein et al. (2013) that found that among family physicians 60% ask, 50% assess, 36% advise, 15.3% assist, and 13.3% arrange, and among Hispanic practicing physicians fewer than 44% ask and advise, 24% assist, 4% arrange follow-up visits, and 36% routinely prescribe cessation medications to smoking patients; only 4% used behavior-changing techniques or referred smokers to programs that use behavior-changing approaches (Soto Mas et al. 2008). The lower results in the pre-intervention phase could be due to many factors such as time constraints relative to the high flow rate in primary care settings with no previous structured program of smoking cessation in Egyptian medical schools and the need for continuing medical education regarding this issue.

Limitations of the study

Assessment of attitude relied primarily on self-reports, and there might have been a tendency of physicians to over-report their attitude. Physicians might be subject to recall bias

in the knowledge test. The rates of changing physicians among the centers and of vacation days were high. Not including a control group was considered a limitation. There were considerable interventions, but the variations in the outcome measures precluded their comparison with the current study. Generalizing the results might be limited because of the non-probability sampling method.

Conclusion

Implementation of a training program on smoking cessation counseling led to markedly improved knowledge, attitude, and practice of primary care physicians working in urban primary care settings in Port Said City.

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Compliance with ethical standards

Conflict of interest The authors declared that there was no conflict of interest.

Ethical considerations The study protocol was approved by the Research and Ethics Committee of the Faculty of Medicine, Suez Canal University, and all participants signed written informed consents. The researchers followed the ethical standards laid down by the Declaration of Helsinki (1964) and its amendments.

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