RESEARCH ARTICLE

Effectiveness of Tobacco Education for Pharmacy Students in Indonesia

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Abstract

　　Background: Smoking remains the major preventable cause of death worldwide, especially cancer-related death. Evidence clearly indicates that tobacco-related morbidity and mortality is reduced by smoking cessation. Pharmacists are well-positioned to provide tobacco cessation services an involvement of pharmacists in smoking cessation is encouraged by several organizations. While Indonesia's prevalence of smoking is in the first rank in Asian countries, none of the pharmacy schools in Indonesia are currently offering tobacco-related courses in their existing curricula at present. Our study aimed to develop and to evaluate the effectiveness of tobacco education (TE) for pharmacy students in Indonesia. Materials and Methods: A 6-hour TE was developed and evaluated using pre-test/post-test with control group design. A total of 137 fifth-year pharmacy students at Gadjah Mada University (GMU), Yogyakarta, were chosen as an intervention group while a total of 105 fifth-year students of Islamic University of Indonesia, (UII) served as the control group. Knowledge, perceived-role, self-efficacy, and ability to perform counseling using the 5A's framework were evaluated. Results: A significant improvement (P < 0.001) in knowledge, perceived-role, and self-efficacy was found in the intervention group but not in the control group. In addition, we revealed that 89.7% of the intervention group were able to perform counseling using 5A's. Conclusions: The developed TE significantly improved student knowledge, perceived-rolse, self-efficacy, and created an ability to perform cessation counseling. Integration of TE education in curricula of Indonesian pharmacy schools nation-wide should be encouraged.

Keywords: Smoking cessation - education - pharmacy student - pharmaceutical care - Indonesia

Introduction

　　Smoking is a major risk factor for many diseases including cancers. Smoking accounts for approximately one-third of all cancer-related deaths and nearly 90% of lung cancer deaths (American Cancer Society, 2013). Evidences indicated that smoking cessation is an important strategy for reducing the tobacco-related harmful effects, especially lung cancer (Wong et al., 2010). To combat cancer effectively, smoking cessation efforts need to be improved. In fact, smoking cessation is recommended as the most prioritized intervention in reducing premature mortality, morbidity and disability from non-communicable diseases by UN-High Level Meeting (Beaglehole et al., 2011).

　　According to the WHO Framework Convention on Tobacco Control (FCTC), the vital contribution of health professionals in tobacco cessation also emphasized (World Health Organization, 2014). In addition, the importance of incorporating tobacco education in the health care professional curriculum was also highlighted in the WHO code of practice on tobacco control (World Health

Organization, 2004). Several studies indicated that health professionals are willing to participate in tobacco cessation activities (Binnal et al., 2012, Saba et al., 2014, Han et al., 2014). Nevertheless, lack of expertise and administrative barrier has been reported as main barriers in inclusion of tobacco control in the health care professional curriculum (Panda et al., 2013, Yadav et al., 2014).

　　Pharmacists are well-positioned to provide smoking cessation services as they are easily accessed by public. Many pharmacotherapies targeting smoking cessation are available in drugstore in many countries. In addition, several types of dispensed medication can link with smoking cessation advice. Services delivered by pharmacists can range from simple advice about the importance of smoking cessation to give advice on cessation medication and more intensive behavioral approaches. At present, an involvement of pharmacists in tobacco cessation was encouraged by several organizations including National Health Service (NHS), the International Pharmaceutical Federation (FIP), American Society of Health System Pharmacy (ASHP) (McRobbie and McEwen, 2005, Siiskonen, September

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2004, Hudmon and Corelli, 2009). However, barriers of pharmacist to provide smoking cessation counseling are lack of time and lack of knowledge and skill (Goniewicz et al., 2010, El Hajj et al., 2012).

Indonesia's prevalence of smoking is in the first rank in the ASEAN countries (Lian and Dorotheo U, 2013). Despite substantial burden of tobacco on total mortality and cancer-related mortality (Kimman et al., 2012, Zheng et al., 2014), there is limited government effort to reduce smoking prevalence in Indonesia. Unlike several developed countries, where the role of pharmacists in tobacco cessation has widely evidenced and tobacco education is common in pharmacy school, none of the 60 pharmacy are currently offering tobacco-related courses in their existing curriculum (Indonesian Association of Higher Education of Pharmacy, 2009). As a future pharmacy, pharmacy students should be equipped with evidence-based knowledge to facilitate smoking cessation intervention. By including education about tobacco in the curricula, they can be informed about the health effects of tobacco use and learn to assist smokers to quit.

Our study is the first study aimed to develop and evaluate the effectiveness of a Tobacco Education (TE) for pharmacy students in Indonesia.

Materials and Methods

A pre-test/post-test design with control group was used in this study. A total of 137 fifth-year pharmacy students at Gadjah Mada University (GMU), Yogyakarta was chosen as an intervention group while a total of 105 fifth-year students of Islamic University of Indonesia, (UII) Yogyakarta was served as control group. Final-year pharmacy students were selected as a target population because of their imminent entry to the profession. GMU is the largest university in Indonesia consisted of 18 faculties and faculty of pharmacy has been ranked as the best government's pharmacy school. UII is one of private-well known universities located in Yogyakarta and serving as partner school for pilot studies of Quit Tobacco Indonesia (QTI)'s tobacco education program previously in 2011. Faculty of Pharmacy UII has been established since 1998 and has similar characteristics in term of number of pharmacy students and facilities with GMU.

The goals of TE were to increase pharmacy students' knowledge about tobacco and tobacco cessation, perceived-role regarding their contribution in tobacco cessation, self-efficacy toward tobacco cessation counseling, and ability to perform tobacco cessation counseling. The TE comprised four sequential modules (3-hour lecture) and three cases scenario (3-hour role-play), which were derived from the 5A's version (comprehensive counseling version) of the Rx for Change program (Hudmon KS et al., 2005) and the QTI's tobacco modules (Prabandari Y et al.). The 4 modules focus on the following issues; (1) epidemiology of tobacco use and its health related consequence; (2) pharmacology of nicotine and pathophysiology of tobacco dependence; (3)

Table 1. Pre-test and Post-test Score on Knowledge, Perceived-role, and Self-efficacy

	Intervention (127) n (%)	Control (100) n (%)	P-value
Knowledge*			
Pre-test score	25.05 (2.61)	23.93 (2.31)	P=0.055
Post-test score	36.03 (2.81)	23.52 (2.07)	P<0.001
Post-test - Pre-test score	10.97 (3.95)	-0.41 (2.99)	P<0.001
Perceived-role**			
Pre-test score	25.27 (2.27)	24.96 (2.51)	P=0.726
Post-test score	28.23 (2.02)	25.20 (1.83)	P<0.001
Post-test - Pre-test score	2.86 (1.87)	0.2 (2.62)	P<0.001
Self-efficacy***			
Pre-test score	27.01 (3.30)	26.65 (2.59)	P=0.143
Post-test score	31.29 (3.36)	26.14 (2.91)	P<0.001
Post-test - Pre-test score	4.26 (3.64)	-0.51 (3.50)	P<0.001

*Score ranges from 0-42 with a higher score indicates higher level of knowledge; **score ranges from 4-32 with a higher score indicates higher level of perceived role; ***score ranges from 4-40 with a higher score indicates higher level of self-efficacy

Table 2. Students' Ability in Performing Tobacco Cessation Counseling

Domain	Criteria (n=127)	N (%)
Ask	1. Ask patients whether he/she smokes or not	114 (97.4)
Advise	2. Advise patient about health impacts of smoking (give leaflet if needed)	111 (94.9)
	3. Advise patient to quit smoking personally related to his/her disease	109 (93.2)
Assess	4. Assess tobacco use history (past and current use) and quit efforts in the past	108 (92.3)
	5. Assess readiness to quit within one month	110 (94)
Assist	6. Facilitate quit process by discussing intervention methods to quit	97 (82.9)
	7. Set a quit date	95 (81.2)
	8. Discuss key issue of stress related to quit and strategies to relieve withdrawal symptom	90 (76.9)
Arrange	9. Arrange for follow-up contact (next week)	104 (88.9)
	10. Good performance *	105 (89.7)

*be able to perform the first 5 criteria of 3A's (i.e. Ask, Advise, Assist) in appropriate order

different types of pharmacotherapy and their use especially Nicotine Replacement Therapy (NRT) and varenicline; and (4) brief intervention of tobacco cessation using the 5A's (ie. Ask, Advise, Assess, Assist, and Arrange follow-up). Three cases scenario for role-play sessions were developed to match with Indonesian situation. The content of TE has been validated using content validity index (CVI) by 4 academic pharmacists and was piloted in a group of fourth-year students before formally introduced. Each module was incorporated into relevant existing courses in the curriculum. Modules were delivered by one investigator while role-play sessions were facilitated by course lecturers.

Early September 2013, prior to the TEP implementation, knowledge regarding tobacco use and treatment, perceived role, and self-efficacy were measured in both intervention and control group. Then, TEP was administered to 137 fifth-year pharmacy students at GMU during September to October of 2013. In November 2013, both intervention and control group completed the post test on knowledge regarding tobacco use and treatment, perceived role, and self-efficacy. For the intervention group, ability to perform tobacco counseling using 5A's framework was also assessed.

The validated questionnaire was used to assess student's knowledge regarding tobacco use and treatment, perceived role, and self-efficacy. The questionnaire was divided into 3 sections. Section 1 included 42 yes/no questions covering students' knowledge regarding four modules, epidemiology, pharmacology of nicotine and nicotine dependence, smoking therapies, and tobacco cessation intervention method. Section 2, perceived role regarding their contribution in tobacco cessation, was adapted from the existing WHO Global Health Professional Survey on tobacco that is widely used across countries include Indonesia (Aditama et al., 2006). This part consisted of 8 questions scored on a 4-point likert scale (1=strongly disagree; 2=disagree; 3=agree; and 4=strongly disagree). Section 3, self-efficacy, included 10 questions measuring pharmacy students' confidence in tobacco cessation counseling. It was adapted from previous study (Hudmon et al., 2006) to match with Indonesia situation. Responses on this part were scored on 4-pointed likert scale (1=not very confident; 2=not confident; 3=quite confident; and 4=very confident). Ability to perform cessation counseling was evaluated using checklist (perform/not perform) containing 9 criteria of 5A's. Students are classified as able to perform tobacco cessation counseling if they performed the first 5 criteria of 3A's (i.e. Ask Advise, Assist) out of the total 9 criteria in appropriate order. Survey on students and faculties' satisfaction regarding the curriculum implementation was also conducted in the intervention group. The study was approved by institutional review board at the GMU.

Results

A total of 242 pharmacy students were joined in TE (137 intervention and 105 control). Of these participants, pre-test was completed by all students and post-test was completed by 237 (98%) (127 intervention and 100 control) pharmacy students. On average, respondents in both groups were in the age of 22 years. Almost all of the students were female, 88.2% and 79% in the intervention group and, control group. Almost all respondents were non-smokers, approximately 97.6% and 95% in intervention and control group. None significant difference in term of characteristics was found between intervention and control group.

During pre-test, there was no difference between intervention and control group in knowledge, perceived-role, and self-efficacy. After TE implementation, the mean score of the three outcomes were improved in the intervention group but not in the control group (Table 1). The improved scores from pre-test to post-test showed significant different between intervention and control group (p<0.001). About 90% of the students in the intervention group were able to perform cessation counseling (Table 2). With respect to the performance for each criteria, result showed that the percentage ranged from 77% (for discuss key issue of stress related to quit and strategies to relieve withdrawal symptoms) to 97% (for ask whether patients smoke or not) (Table 2). Survey on students and faculty members' satisfaction demonstrated that both groups were satisfied with the developed TE. In addition, faculty members reported that they were likely to implement the TE in the upcoming year.

Discussion

Similar to the previous studies (Schmelz AN et al., 2010, Corelli KL et al., 2005, Saba M et al., 2013, Prabandari Y et al.), the results of this pilot study was found that TEP had positive effect on students' knowledge, perceived role, self-efficacy, and ability to perform tobacco cessation counseling. These findings are notable because such program was entirely new in Indonesia. As one of the key strategies to reduce tobacco-related morbidity and mortality especially cancer-related morbidity and mortality is to encourage the involvement of the health professional (World Health Organization, 2014, Oberoi SS et al., 2014), integration of tobacco cessation in the pharmacy school curricular should be encouraged. We envision that the TE will lead to a shared, model tobacco cessation curriculum that can be disseminated nationally to pharmacy students and pharmacists in Indonesia.

A possible limitation of this study includes lack of follow-up duration. While the initial findings of this pilot study are encouraging, more extensive study should be conducted to show definitive benefit in term of professional practice. Another limitation could be the test-retest bias, where students knew the same survey instrument would be used to assess their knowledge, perceived role, and self-efficacy both before and after program implementation. However, this bias is minimized by incorporate the control group in the study.

Integration of TE in the curricular of pharmacy school significantly improved pharmacy students' knowledge, perceived-role, self-efficacy, and create ability to perform tobacco cessation counseling. Efforts are needed to incorporate such program into pharmacy school's curricula on a national scale to increase the number of

future pharmacists who can provide cessation services for smokers in Indonesia.

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