Results of a selective smoking cessation counseling and prevention course

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ABSTRACT

Our aim was to investigate the effect of a selective smoking cessation counseling class on the skills and knowledge of medical students. Sixty medical students from Ondokuz Mayis University attended a selective smoking cessation counseling and prevention class (total 96 hours) at 2011-2012 academic year. After attending an initial 8 weeks of lectures, problem-based sessions, case presentations, patient videos and workshops, the students then assisted with the counseling of real smokers in the remaining 4 weeks, under supervision. Students' knowledge of tobacco dependence, treatment and counseling strategies was scored before (pretest) and after (post-test) the course using a 50-item questionnaire. The students' skills were evaluated in an Objective Structured Clinical Exam (OSCE). A significant difference was determined between the pretest (12.7±7.6) and post-test (35.8±7.8) results (p<0.001). The mean OSCE score was 89.2±2.7. The smoking cessation counseling and prevention selective class is highly effective in improving students' cessation counseling skills.

1. Introduction

Smoking is the single most important preventable risk factor for global mortality and morbidity from many diseases, from cardiovascular diseases to cancer (Mathers and Loncar, 2006; WHO, 2013). Regardless of their specialty, physicians' responsibilities in the fight against smoking can be grouped under three main goals; to ensure that non-smokers do not start (especially children and teenagers), to help smokers to quit (especially more vulnerable individuals such as pregnant women and children) and lastly to encourage ex-smokers not to relapse (Zwar et al., 2014). However, several studies have shown that many physicians lose motivation and interest in promoting these services (McAvoy et al., 1999; Ellerbeck et al., 2001; Ferguson et al., 2005). A heavy work load and insufficient time, a lack of systems to support cessation services and an absence of financial incentives are some factors that have been investigated to account for this (Rigotti and Thorndike, 2001; Brotons et al., 2005). Many physicians report feeling insufficient confidence in their counseling skills and believe that the most important obstacle to promoting these activities is a lack of adequate training and skills (Conroy et al., 2005; Warner et al., 2013). Despite the impact of smoking on human health, undergraduate medical

education fails to devote proper attention to improving cessation and prevention skills and knowledge (Ferry et al., 1999; Montalto et al., 2004; Richmond, 2009). Although it has been suggested that undergraduate education is the optimal time for skills training in tobacco cessation, most physicians manage to graduate from medical schools with no or only minimal formal training in cessation and prevention (Richmond et al., 2009). Many medical schools around the world still prefer to imbed didactic information regarding smoking and tobacco dependence into the curriculum (Frank et al., 2007). Special modules, tasks or courses concentrating on the subject are rare, and individual cessation or prevention skills training is of low priority in undergraduate or postgraduate medical education (Frank et al., 2007; Richmond et al., 2009,). Without understanding the importance of the topic, students rarely have an opportunity to provide counselling for real smokers during this period, leaving them untrained and unprepared after graduation (Chatkin and Chatkin, 2009). It is not surprising that there are many calls for urgent changes to under- and postgraduate medical education, which currently fails to respond to major public health problems in many parts of the world (Springer et al., 2008; Ponciano-Rodrigez, 2010).

Promoting the smoking and cessation counselling skills of undergraduate students through specialized courses may pose various advantages. Such courses will not only prepare students for their professional lives, but will also encourage them to focus on this topic at a very early stage. The aim of the class was to provide early clinical contact (Students are evaluated through an objective structured clinical exam with simulated patients) after they have counseled a volunteer real smoker under the supervision of an academic. The aim of this study was to investigate the effect of this class on students' knowledge and skills in the area of smoking cessation. We also analyzed the effectiveness of counseling activities provided for their own social circles by students who had participated in this class.

2. Materials and methods
2.1.The design of the study
This is a descriptive and analytic study. We designed a pilot selective smoking quit counseling and prevention class lasting 12 weeks (every Wednesday for 8 hours for a total of 96 hours) for 1st year medical students at Ondokuz Mayis University, Turkey, based on current evidence-based medicine (Richmond, 1999; Springer et al., 2008; Fiore et al, 2008; NIH, 2008; Richmond et al., 2009; Lai et al., 2010; Cahill et al., 2013; Stead et al., 2013; Hartman-Boyce et al., 2014) at 2011-2012 academic year. The class content and learning objectives are presented in Appendix 1. The schedule and program of the class is summarized in Appendix 2. In order to achieve the greatest efficiency from

the class, the number of students was limited to 60. After the content of the class had been announced, the first 60 volunteers out of 210 1st year students were enrolled. The participants first answered a survey about their demographic data and their own and their family smoking status. All participants described their exposure to second-hand smoke in a five-point Likert type question (5=very often, 4=often, 3=sometimes, 2=occasionally, 1=never), while those students who stated that they had smoked more than 100 cigarettes in their lives to date also took the Fagerstrom Nicotine Dependence Test (FNDT). Students' knowledge of tobacco dependence and treatment and counseling strategies was evaluated before (pretest) the beginning of the class. Students attended the first half of the program (1st to 4th weeks) at the medical faculty and the second half (5th to 12th weeks) at the smoking cessation clinic of the Ondokuz Mayıs University Department of Family Medicine. Once the program had come to an end, students were evaluated through a written exam, OSCE, a clinical interview and a special task.

2.2. The smoking cessation counseling and prevention class
The aim of the class was to increase the knowledge and skills of the medical students in order to help smokers quit smoking, to maintain ex-smokers as non-smokers and to prevent non-smokers starting smoking at all. The class consisted of didactic, skills training and applied skills training elements.

2.3. Didactic educational activities
The didactic educational activities (active presentations and two different problem-based scenario sessions) lasted for 20 hours. In the problem-based sessions (total 8 hours) students encountered two different scenarios.

2.4. Skills training
For skills training, role-plays (three role-play sessions), workshops (three workshops), watching and discussing patients' videos with different counseling techniques (videos of six different real smoker visits), were used for a total 30 hours of education. In role-plays, each student participated by assuming the role of a physician and various smoker roles selected by chance from a range of different scenarios. In the workshops, the students were divided into five separate groups. In the first workshop, we asked them to prepare different patient education handouts, in the second they designed a poster which might be used in primary care settings to motivate smokers to quit, and finally each group was asked to design an imaginary nationwide public anti-smoking campaign. The groups then presented their work to the other groups. The patient videos were selected from different range of real patient interventions.

2.5. Applied skills training

Applied skills training was given for a total of 46 hours. Between the 5th and 8th weeks (after most of the learning objectives had been achieved from didactic educational and skills training) the entire group and one academic together counseled different patients every day (planetary sessions) and then discussed them. After the 8th week, each student was appointed to an academic on a one-to-one basis in order to counsel patients. During applied skills training, medical students had an opportunity to experience many different problems (prevention or cessation counseling for smokers or ex-smokers) at first hand with academic counseling.

2.6. Evaluation of the class

The students were evaluated in three steps. The first, pretest, was taken before the class began. At the end of the class students were readministered the same test, the post-test. The results of the post-test are taken as written exam scores and were used to evaluate their informative knowledge. The difference between the pre- and post-test results was analyzed in order to investigate the increase in the knowledge of the subject by the end of the class. The tests were scored between 0 and 100, with 2 points given for each correct answer to 50 multiple choice questions. The day after the post-test, students were tested with simulated patients in an Objective Structured Clinical Exam (OSCE). The simulated patients were provided by our university's drama club. Students were tested with standardized scenarios in one-way mirrored rooms. While they were counseling these simulated patients they were themselves being evaluated by researchers with a standardized check list in the adjacent room on the other side of the mirror. Each student had approximately 20 minutes for interviews in the OSCE.

In the third step, students provided counseling sessions for volunteer patients. The students were responsible for applying a standardized approach, described elsewhere, to these patients (Raupach, 2015). They were mainly responsible for taking smoking histories and discussing personalized session plans with patients. Their performance was evaluated by the same supervisor sitting next to them in the same room who had been appointed at the 8th week, using a standardized checklist (the same one as also used in the OSCE). Each student was allowed approximately 20 minutes for interviews. After the patient had left the room, the supervisor provided immediate feedback about students' performances. These patients received another visit with a different clinician after the first visit on the same day. These patients were selected from smokers who were determined to quit smoking and who were on their first visit to our clinic. They were aged over 18 years, were not pregnant and had no known psychiatric diseases or other drug/alcohol addiction.

The total class score was calculated with these three activities. The post-test scores were weighted as 35%, the OSCE as 35%, clinical counselling as 30% of the total score. All the activities were scored between 0 and 100 points, and the pass mark was 75 or above.

2.7. Statistical analysis

All analyses were performed on SPSS version 15 (Chicago IL) and Minitab version 15 software. Several parametric and non-parametric analytic techniques, including the Chi-square and Independent samples t-test were used. A p value of <0.05 was regarded as significant.

Approval for the study and the class content was granted by the dean of the Ondokuz Mayis University Medical Faculty.

3. Results

Students' demographic and smoking characteristics are shown in Table 1. Although there was no difference between the sexes in terms of direct experience of smoking, male students were more exposed to secondhand smoking ($p < 0.001$). There was a statistically significant difference between the mean pre- (22.78 ± 7.6) and post-test (44.8 ± 2.1) correct answer scores (50 items) ($t = 7.562$, $p < 0.001$). Detailed pre- and post-test results showing students' answers to different items are presented in Table 2. Students' knowledge levels had increased in all areas according to the post-test results. Detailed evaluation methods and mean scores from different items from the OSCE and Clinical Interview are presented in Table 3. The mean score for the OSCE was 89.2 ± 2.7. Students scored 90.0 ± 4.8 on

Table 1. Demographic and smoking characteristics of the students participating in the class

Variable	Male n=28 (46%)	Female n=32 (54%)	p
Age (years)	23.14±1.5	22.7±6.9	t=0.0125 p=0.417
Have you ever smoked? Never <100 to date >100 to date	18 (64.2%) 4 (14.2%) 8 (28.5%)	20 (62.5%) 6 (18.75%) 4 (12.5%)	x²=0.214 p=0.548
FNDT Score*	4.1±0.2	2.1±0.3	Z=1.125 P=0.02
Do your parents smoke? Father Mother	11 (38%) 4 (15%)	12 (36%) 3 (9.3%)	x²=0.954 p=0.258
Have you ever been exposed to secondhand smoke? Mean value (5=very much, 4=much, 3=sometimes, 2=rarely 1=never)	2.45±3.2	1.8±2.7	t=2.045 p<0.01

* Mean Fagerstrom Nicotine Dependence Test score of students who had smoked more than 100 cigarettes to date.

Table 2. Students' pre- and post-test score results

ITEM	Pretest n, %	Post-test n, %
Number of smokers age over 18 in Turkey (1 item)		
Underestimated	35, 58.3%	7, 11.6%
Overestimated	5, 8.3%	3, 6%
Answers within acceptable range (35-45%)	20, 33.3%	50, 83.3%
Risk of smoking to general health (10 items)		
0-3 correct answers	35, 58.3%	1, 1.6%
4-7 correct answers	12, 20%	6, 10%
≥ 8 correct answers	13, 21.6%	53, 88.3%
Health risk of secondhand smoke (4 items)		
0-2 correct answers	56, 93.3%	4, 6.6%
3 correct answers	3, 5%	5, 8.3%
All answers correct	1, 1.6%	51, 85%
Health risk of smoking during pregnancy (3 items)		
0-1 correct answers	20, 33.3%	2, 3.2%
2 correct answers	28, 46.6%	3, 5%
All answers correct	12, 20%	55, 91.6%
Risk of starting smoking before age 18 (1 item)	3, 5%	56, 93,3%
Benefits of cessation in terms of heart disease risk (1 item)		
Underestimated	5, 8.3%	0, 0%
Overestimated	35, 58.3%	4, 6.6%
Answers within acceptable range (35-45%)	20, 33.3%	56, 93.3%
Benefits of smoking cessation in terms of lung cancer risk (1 item)		
Underestimated	14, 23.3%	6, 10%
Overestimated	35, 58.3%	6, 10%
Answers within acceptable range (35-45%)	11, 18.3%	48, 80%
Benefits of cessation in terms of other cancers and diseases (2 items)		
Correct answers for cancers	22, 36.6%	55, 91.6%
Correct answers for other diseases	19, 31.6%	56, 93.3%
Benefits of cessation in terms of premature death (1 item)	15, 25%	58, 96.6%
Percentage of Turkish smokers who want to quit (1)		
Underestimated	18, 30%	2, 3.2%
Overestimated	26, 43.3%	5, 8.3%
Answers within acceptable range (60-70%)	16, 26.6%	53, 88.3%
Percentage of smokers expecting to quit on their own within a year (1 item)		
Underestimated	1, 1.6%	0, 0
Overestimated	48, 80%	4, 6.4%
Answers within acceptable range (<5%)	11, 18.3%	56, 93.3%
The role of the primary care physician (4 items)		
Correct answer concerning asking each patient about smoking status	2, 3.2%	56, 93.3%
Correct answer concerning opportunistic smoking counseling	6, 9.6%	57, 95%
Correct answer for steps of 5As	2, 3.2%	58, 96,6%
Correct answer for steps of 5Rs	1, 1.6%	57, 95%
Model of stages of readiness to change (1 item)	5, 8.3%	58, 96.6%
Short- and middle-term nicotine craving symptoms (5 items)		
0-3 correct answers	37, 61.6%	2, 3.2%
4 correct answers	12, 20%	4, 6.4%
All answers correct	11, 18.3%	54, 90%
Principles of motivational interview (1 item)	2, 3.2%	57, 95%
Principles of life style changes (4 item)		
Correct answer concerning modifying smoking routines till quit day	4, 6,4%	58, 96.6%
Correct answer concerning features of a healthy diet	2, 3,2%	59, 98.3%
Correct answer concerning features exercises	2,3,2%	57, 95%
Correct answer concerning features hobbies	3, 5%	58, 96.6%
Nicotine replacement therapy (NRT) (4 items)		
Correct success ratio	0, 0%	55, 91.6%
Correct answer concerning features of nicotine gum	1, 1.6%	56, 93.3%
Correct answer concerning features of nicotine patches	2, 3.2%	58, 96.6%
Correct answer concerning contraindication	0, 0%	58, 96.6%
Pharmacological therapy (Bupropion and Varenicline) (5 items)		
Correct success ratio for Bupropion	2, 3.2%	52, 86.6%
Correct success ratio for Varenicline	3, 5%	54, 90%
Correct success ratio for combinations	4, 6.4%	58, 96.6%
Correct answer concerning features of Bupropion therapy	2, 3.2%	56, 93.3%
Correct answer concerning features of Varenicline therapy	1, 1.6%	58, 96.6%
Correct answer concerning contraindications for both	1, 1.6%	57, 95%

Table 3. Detailed evaluation methods and mean scores from OSCE, Clinical Interview, and patient files (task)

Steps	Evaluation	Mean Score		
		OSCE	Clinical Interview	p
Benefits of individual health gains if the subject stops smoking	2 points max. 2 points=more than 3 examples are discussed 1 point=1-3 examples are discussed 0 points=If none are discussed	1.2±0.5	1.1±0.9	0.155
Calculation of Fagerstrom Nicotine Dependence Test score	3 points in total if correctly calculated 1 point is subtracted from the total for every mistake	1.7±0.5	1.8±0.3	0.214
Calculation of package/year score	3 points in total if it is correctly calculated With every mistake 1 point is extracted from the total	2.1±0.2	2.0±0.1	0.317
Former quit attempts by the smoker and the methods used	2 points in total 1 points for asking attempts 1 points for asking former used methods	1.2±0.2	1.3±0.1	0.541
Factors triggering smoking (minimum of three)	5 points in total 5 points=3 or more examples are discussed 4 points=2 examples are discussed 3 points=at least 1 example is discussed 0 points=If none are discussed	3.5±0.1	3.3±0.1	0.678

Life style modifications (until quit day)
    Change the last brand of cigarette consumed
    Change the place where you smoke
    Avoid smoking with or after tea
    Avoid smoking with or after any meal
    Avoid smoking in your social surroundings
    Wait as long as you can for the first morning cigarette (at least 30 minutes)
    Change the place where you smoke at home
    Increase physical activity levels
    Increase amount of daily water consumption
    Try to find a hobby
	20 points
	2 points for discussion of each modification
		15.8±0.8	16.5±0.5	0.147

Enlist the support of family and friends	2 points if asked and listed	1.1±0.1	1.4±0.3	0.142

Information about NRT*
    General data about different types of NRT
    Use of NRT
        Teaching smokers who had chosen nicotine gum how to teach chew and park
        Teaching smokers who had chosen patches how to use them
    Side-effects of NRT
	15 points in total*
	5 points=if general information is given
	5 points=if the use of NRT is discussed properly
	5 points=if the side-effects are discussed
		12.4±0.2	11.9±0.4	0.087

Information about pharmacological therapy**
    General data about different types of drug
    Data about indications and side-effects of the drug
    Use of drugs (dosage/time schedule)
	15 points in total**
	5 points for each item discussed with the patient
		11.09±0.7	12.2±0.9	0.108

Draw up a personalized treatment plan
    Motivational interview (MI) only
    MI+NRT
    Bupropion
    Bupropion+NRT
    Varenicline
	20 points in total if the treatment plan is discussed with the patient	16.9±0.1	17.5±0.2	0.097

Individualized plan for quit day
    Appoint a quit date
    Provide information about the symptoms of nicotine withdrawal
    Establish a plan for nicotine cravings
    Remove the smell of nicotine from the house, clothes or car
    Remove all tobacco products and equipment from house/work
	5 points in total
	1 points for every item discussed with the patient
		3.6±0.8	3.7±0.9	0.078

Establish a reward system for not smoking
    Short term
    Long term
	3 points in total
	1.5 points for every item discussed with the patient
		1.7±0.4	1.8±0.2	0.215

Avoid relapse
    Provide information about slips and relapse
    Establish a plan for relapse management
	5 points in total
	2.5 points for every item discussed with the patient
		3.0±0.2	3.0±0.5	0.321

Total		89.2±2.7	90.0±4.8	0.109

clinical counseling. Students scored a mean 89.2±0.4 from the class based on their post-test, OSCE, clinical counselling.

4. Discussion

In designing this class our main concern was to provide medical students with the essential knowledge and skills they would require to counsel smokers in their professional lives. From that point of view the class was designed as one of the most intense and integrated smoking cessation counseling classes in current undergraduate medical training. Students spent 96 hours on the class, nearly half of which represented clinical interviews. This length of time is very high compared to many other medical schools around the world (Richmond, 1999; Frank et al., 2007; Richmond et al., 2009; Chatkin and Chatkin, 2009; Raupach et al., 2015). Many countries devote an average of 7 to 8 hours of education focused on tobacco provided throughout the entire medical curriculum. One of the most important aspects of the class is giving students the opportunity for very early clinical contact with real smokers. Every student has the opportunity to counsel many different types of smokers (first attempt, relapsed smokers, teenagers, pregnant women etc.) under the supervision of academics. Richmond et al. (1999) concluded that only 45% of medical students worldwide have the opportunity to interface with real smokers.

Students' smoking cessation and prevention knowledge and skills increased after participation in this selective class. We evaluated different aspects of the class using various evaluation methods. Students' informative knowledge was evaluated with written exams (pre- and post-test results), and their skills and applied skills were tested with OSCE and Clinical Interview. There were two reasons for evaluating the students' skills and applied skills using two different skill evaluation methods. First, although OSCE is a well proven and effective way of evaluating students' skills, the smoking status of simulated patients or students (members of the drama club) might affect the entire process. A non-smoker pretending to be a patient might lack the experience of a real smoker, and a smoker who had frequent relapses might be poorly motivated. The objectivity and performance of the simulated patients might limit the accuracy of the scenario and the accuracy of the evaluation (Mounsey et al., 2006). Second, in OSCE, while educators can control every factor in a fictional clinical environment (features of the simulated patient, time schedule, etc.) which provides a good idea of a medical student's performance, real clinical practice is full of unforeseen factors to which the physician must quickly adapt and find solutions. Clinical interviews have the advantage of evaluating a student's performance and reaction to real-

life situations. We therefore elected to use not overly-complicated cases rather than extreme cases (patients with psychotic symptoms or other psychological problems, pregnancy, teenagers or individuals with a history of many relapses, etc.) in order to avoid confronting them with a situation beyond their abilities. OSCE and clinical interview pose advantages and disadvantages which perfectly compensate for one another.

We apply the selective smoking cessation and prevention knowledge and skills class as early as possible in the early period of medical education for a number of reasons. The importance of the philosophy of primary prevention may best be seeded before students are concentrating on other specialties which attach high priority to interventions in their learning objectives. Frank et al. (2007) stated that students' attitudes shift towards prevention rather than intervention if they receive the appropriate instruction earlier in their medical training. However, in order to use these knowledge and skills properly in their professional lives, medical students must have occasional opportunities to practice and sharpen their skills during their medical education (spiral education principle).

Although our class covered many areas of tobacco cessation and prevention using a range of learning methods (lectures, discussions, case studies, problem-based learning sessions, etc.), as recommended in other publications (Springer et al., 2008), we did not employ web-based learning. That method offers many advantages, such as instant access to data, the formation of discussion groups or the opportunity to consult patients. However, we decided to devote some of our problem-based scenarios to an interactive web-based model. We believe that this method is more important in classes with a large number of participants when the number of PBL instructors is limited. The same problem can be overcome in clinical settings if there are also enough clinicians who can work one-to-one with medical students. If this class is included in the curriculum as a standard class instead of a selective one, the need for educators qualified in field of tobacco cessation will be critical. In order to ensure that our program ran smoothly we worked with real smokers receiving treatment in our clinic. This left the students to deal first-hand with patients who were very highly motivated to quit smoking. Although primary care mostly advocates horizontal health care services (Holmberg et al., 2014), in countries with very high rates of smoking, longitudinal organizations (specialized centers) can be very useful in terms of education and referral of selected cases.

In a country such as Turkey where 19 million adults smoke regularly, the first priority in medical education should be cessation and prevention (Bilir et

al., 2009). New and effective methods or techniques should be investigated in order to promote these skills and knowledge. Strategies to overcome some common problems (such as a lack of motivated and qualified instructors, resources and time, and inflexible curricula) in this field should be also investigated. In conclusion, this study describes a successful model for promoting tobacco cessation knowledge and skills. The advantage of this study is that the class can be given not only to undergraduates but also to postgraduate students (residents) or in the form of continuing medical education for professionals. This will inevitably result in new volunteers for a smoke-free world.

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