18 | 2021

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TEACHING MEDICAL STUDENTS ABOUT SMOKING CESSATION AND REDUCING EXPOSURE TO SECOND-HAND SMOKE IN PATIENTS – FOUR-YEAR EXPERIENCES AT THE MEDICAL UNIVERSITY OF LODZ

Wydawnictwo Uniwersytetu Medycznego w Łodzi

ŁÓDŹ 2021

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NAUCZANIE STUDENTÓW MEDYCYNY O REDUKOWANIU PALENIA TYTONIU I EKSPOZYCJI NA WTÓRNY DYM TYTONIOWY WŚRÓD PACJENTÓW – CZTERY LATA DOŚWIADCZEŃ UNIWERSYTETU MEDYCZNEGO W ŁODZI

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UMEDICAL REPORTS 18 | 2021

Seria monografii naukowych dotyczących zagadnień z zakresu dyscyplin nauk farmaceutycznych, nauk medycznych i nauk o zdrowiu.

Wydawnictwo recenzowane i punktowane na zasadach zgodnych z Rozporządzeniem MNiSW z dnia 22 lutego 2019 r. w sprawie ewaluacji jakości działalności naukowej (Dz.U. 2019 poz. 392 z późn. zm.).

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WYDAWNICTWO UNIWERSYTETU MEDYCZNEGO W ŁODZI
http://wydawnictwo.umed.pl/
e-mail: editorial@reports.umed.pl

Unikatowy identyfikator Wydawnictwa: 60000
(Komunikat Ministra Edukacji i Nauki z dnia 22 lipca 2021 r. w sprawie wykazu wydawnictw publikujących recenzowane monografie naukowe)

ISBN 978-83-67198-08-0

WYDANIE PIERWSZE

Abstract: Medical universities teach students about tobacco control strategies and smoking cessation interventions. Rarely medical students learn how to assist a passive smoker to reduce exposure to second-hand smoke (SHS) and to create smoke-free environments. The purpose of the study is to develop a comprehensive tobacco curriculum to teach medical students both clinical approach to smoking cessation and reducing exposure to SHS. Since 2013 the Department of Preventive Medicine at the Medical University of Lodz (DPM-MUL) has extended the tobacco curriculum according to the WHO recommendations. The teaching staff has been strongly experienced in tobacco control. Four teaching/learning formats were used: 2h lecture, 5h seminar, 2h self-learning, 2–3h e-learning by website course. In 2015–2017 an observational study was conducted to assess students achievements after completing the extended course and relations of gender and year at university to these achievements. A total of 915 medical students participated in the study in 2015–2017. The binary analysis models with non-parametric U-Mann–Whitney test for two independent samples were used. Over 90% students received e-learning certificates. Contrary to the student's gender, a study year at the university (5^{th} vs. 6^{th}) occurred statistically significant in relation to the mark after the completed course. The DPM-MUL tobacco course occurred feasible and well-tailored to medical students. Revision of the traditional model of curriculum for medical students addressing tobacco control is needed.

Keywords: smoking cessation, reducing second-hand smoke exposure, medical students, medical schools, tobacco control

Streszczenie: Uczelnie medyczne nauczają studentów zagadnień strategii kontroli tytoniu i interwencji zaprzestania palenia. Rzadko studenci kierunków medycznych uczą się, jak pomagać osobie będącej biernym palaczem redukować narażenie na wtórny dym tytoniowy i tworzyć środowiska wolne od tytoniu. Celem pracy było utworzenie kompleksowego programu nauczania klinicznego podejścia do zaprzestania palenia, jak i redukowania ekspozycji na dym tytoniowy wśród pacjentów adresowanego do studentów kierunku lekarskiego. Od 2013 roku Zakład Medycyny Zapobiegawczej Uniwersytetu Medycznego w Łodzi rozszerzył program nauczania zgodnie z wytycznymi WHO. Zespół nauczający stanowili nauczyciele doświadczeni w kontroli tytoniu. Zastosowano 4 formaty nauczania/uczenia się: 2 godz. wykładu, 5 godz. seminarium, 2 godz. samokształcenia, 2–3 godz. e-learningu. W latach 2015–2017 przeprowadzono badanie ewaluacyjne w celu ocenienia osiągnięć edukacyjnych studentów (N=915). Zastosowano Test U-Manna–Whitney'a dla dwóch prób niezależnych. Ponad 90% studentów uzyskało certyfikat e-learningu. Jedynym czynnikiem różnicującym ocenę zaliczającą przedmiot był rok studiów (V vs. VI). Program nauczania okazał się wykonalny i dobrze dopasowany do studentów medycyny. Należy dokonywać na uniwersytetach rewizji tradycyjnych programów nauczania dot. kontroli tytoniu.

Słowa kluczowe: zaprzestanie palenia, redukowanie ekspozycji na wtórny dym tytoniowy, studenci kierunku lekarskiego, kontrola tytoniu

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Introduction

Tobacco use and second-hand smoke exposure (SHSe) also known as environmental tobacco smoke (ETS) damage every part of the human body. Active smoking has been recognized as harmful to a smoker for seven decades (Doll and Hill, 1950). Nevertheless, we needed nearly 25 following to discuss SHS in the context of parental smoking and health effects in children for the first time (Harlap and Davis, 1974).

Tobacco smoking is a major risk factor for six of the eight leading causes of death in the world. Tobacco epidemic kills more than 7 million people each year, of whom more than six million are users or ex-users, and around 890 000 are non-smokers exposed to second-hand smoke. About 7000 chemicals have been identified in tobacco smoke. At least 250 are harmful and 70 caused cancer (World Health Organization, 2021).

In 1990, tobacco use and dependence were assessed as the leading preventable cause of morbidity and mortality (U.S. Department of Health and Human Services, 1990). Second hand smoke is laden with known carcinogens, and there is no safe level of exposure to it. (Office of Health and Environmental Assessment, 1992; U.S. Department HHS, CDC, A Report of the Surgeon General, 2006). The World Health Organization (WHO) has identified the need to reduce parental smoking as a key element of action encouraging health and development in early childhood, particularly among the socio-economic disadvantaged population (World Health Organization, 1999).

Many studies have shown strong and consistent associations between SHS and a variety of diseases. It has been estimated that SHS is independently the third leading preventable cause of death and therefore, a significant public health burden (Glantz and Parmley, 1991). Globally, 80% of the world's smokers live in low- and middle-income countries (IARC/WHO World Cancer Report 2020), most of which have demonstrated little political willingness to enforce smoke-free legislations (Pugmire et al., 2017). Clearly, children and adults are both endangered by SHS in their homes, cars and other environments. The impact of SHS on infants and children, pregnant women and women with smoking spouses are particularly alarming.

For thirty years, researchers have developed recommendations on how to assess and treat tobacco use and dependence (Fiore et al., 1990; Fiore et al., 1996; Fiore et al., 2000; Fiore et al., 2004a, Fiore et al., 2008). Implementing guidelines for smoking cessation into clinical practice requires transfer of evidence-based knowledge to medical doctors (Fiore et al., 2004b; Zwar et al., 2009).

Another important way to control tobacco use is to encourage medical schools to include tobacco education in the curricula. Medical students should be taught about tobacco control strategies, smoking cessation interventions and interventions to reduce exposure to SHS (Richmond, 2009a).

TEACHING MEDICAL STUDENTS ABOUT TOBACCO IN THE WORLD

The need to teach tobacco control in medical schools, including smoking cessation methods, is globally recognized.

Important initiatives were taken during late 1980s and in 1990s. Tessier et al. have conducted a series of worldwide surveys on knowledge and attitudes towards tobacco among the first and final year medical students in 51 medical schools in 42 countries (Tessier et al. 1989, 1992a,1992b,1993; Crofton et al. 1994). Using the WHO's World Directory of Medical Schools [1] (World Health Organization, 2000), the Tobacco Prevention Section of the International Union Against Tuberculosis and Lung Disease (IUATLD), in collaboration with the World Health Organization, questionnaires have been sent to 1353 medical schools in 159 countries to determine whether tobacco was taught in medical schools globally (Richmond et al., 1998; Richmond, 1999).

[1]The World Health Organization's World Directory of Medical Schools was transferred to the new World Directory, that is a joint venture of the World Federation for Medical Education (WFME) and the Foundation for Advancement of International Medical Education and Research (FAIMER) (World Health Organization, 2000).

These series of studies have revealed serious deficiencies of tobacco education in medical schools (only 11% of medical schools had a specific module on tobacco) and in the knowledge of common tobacco-related diseases among medical students. In conclusion, the authors recommended an urgent need to introduce tobacco modules in the medical schools' curricula (Richmond et al., 1998; Richmond, 1999).

TEACHING MEDICAL STUDENTS ABOUT TOBACCO IN AUSTRALIA

In 2009, Richmond et al. explored and compared results reported ten years earlier, to determine the curricula content, range of teaching formats and to identify barriers to teaching about tobacco in medical schools (Richmond et al., 2009b). These explorations resulted in developing a course on tobacco called Smokescreen Education Program (SEP), comprising a tutorial program and a lecture. The course aimed at improving knowledge among medical students at the University of New South Wales (UNSW) in Australia, on tobacco, skills in smoking cessation and attitudes towards smokers.

The Smokescreen Education Program is a two-part tobacco curriculum. Part 1 is a one-hour lecture on tobacco for medical students, comprising nine possible issues, from which the teacher can choose (smoking prevalence in the country; harmful components of tobacco; major health effects of tobacco use and benefits of quitting smoking; passive smoking; type of tobacco products; nicotine dependence; the role of a medical practitioner in tobacco control; economic aspects of tobacco; and the tobacco industry). Part 2 is a two-hour six-part tutorial with topics that include: identifying smokers; raising the issue of smoking; taking a smoking history; identifying the stage of readiness to change smoking behavior; motivational interviewing; skills based strategies; and relapse prevention (Richmond, 2004).

The process of developing, revising and implementing the SEP model has been well-written up and the model was applied in China. The SEP was developed over a decade and led to the development of a practical model of dissemination through doctors who translated and introduced the tobacco curriculum into different countries and through workshops. A six-point model of implementation including: defining the extent of tobacco issue in medical schools, developing a flexible tobacco curriculum, developing networks in countries, working as a resource, following up after training, and evaluating success, was developed (Richmond, 1999; Richmond, 2004; Richmond, and Taylor, 2006).

TEACHING MEDICAL STUDENTS ABOUT TOBACCO IN U.S.

Before 1992, there was no published national survey of smoking cessation curricula for medical schools and no undergraduate medical educational program focused on tobacco in U.S. (Fiore et al., 1994).

1992–2002: FIRST PHASE OF NATION-WIDE TEACHING ABOUT TOBACCO IN U.S. MEDICAL SCHOOLS

In 1992 the National Cancer Institute (NCI) the Expert Panel: Mission and Goals addressed the lack of emphasis on smoking cessation curricula in medical schools. The mission of the panel was to assess and promote undergraduate medical education in smoking cessation and prevention. The experts reviewed existing research and experience in smoking cessation and prevention interventions in medical school curricula. They identified components of an effective smoking cessation and prevention curriculum for medical students and strategies for integrating smoking cessation and prevention teaching into medical school curricula. The experts concluded that a specific curriculum devoted to smoking cessation and prevention should become a mandatory component of undergraduate medical education in every U.S. school.

The NCI model program "How to Help Your Patients Stop Smoking" (Epps and Manley, 1990) was served by the expert panel as a source document for developing nationwide curricula in cessation and prevention of tobacco use. Other experts have concluded that the effectiveness of smoking cessation and prevention curriculum must be evaluated. In addition, questions on smoking cessation and prevention should be included in the U.S. medical licensing examinations

as a way to emphasize the smoking cessation and prevention curricula. They have also emphasized the importance of faculty development workshops and materials.

The panel experts stated that undergraduate medical education was "an underutilized opportunity to teach physicians effective smoking cessation and prevention interventions". Medical schools in U.S. established a goal to incorporate the training as part of every medical student's education by 1995 (Fiore et al., 1994).

SINCE 2002: SECOND PHASE OF TEACHING ABOUT TOBACCO IN U.S. MEDICAL SCHOOLS

In 2002, the next important step was taken to incorporate tobacco curricula into the U.S. medical schools. The National Cancer Institute funded the Prevention and Cessation Education Consortium to develop, test and integrate tobacco curricula in 12 US medical schools[2]. Tobacco Prevention and Cessation Education at U.S. Medical Schools (PACE survey) was launched to assess tobacco teaching and implement it into the curricula. Existing tobacco curriculum, institutional structure, and possible opportunities for and challenges to the integration of new curriculum were investigated.

The PACE survey outcomes presented tobacco content by five objective themes in elective courses at 12 U.S. medical schools: Epidemiology, disease causation; Counseling, efficacy, principles; Pharmacotherapy; Public health; Counseling, efficacy, principles (Pediatrics). The last theme included: Discussing passive smoke with a parent (Powers et al., 2004).

Medical schools ranked students' skills in smoking prevention and cessation, and in public health and policy as poor to average. The PACE participants developed a new tobacco curriculum and curricular changes that were implemented in 2004–2005 (Powers et al., 2004).

Since there was neither an explicit set of tobacco competencies for medical schools nor a process to develop them, one of the Consortium's tasks was to articulate learning objectives and competencies. Learning objectives included: affective, cognitive and skills objectives. Competencies were organized according to: (1) adult cessation and prevention competencies, (2) pediatric cessation and prevention competencies, (3) public health advocacy/population science competencies, (4) support systems in clinic/medical setting competencies, (5) professional development/global competencies (Geller et al., 2005).

The final competencies were developed by reaching a consensus by all investigators from the 12 participating universities. The Association of American Medical Colleges supported the shift to competency-based education. The 2004 National Action Plan for Tobacco Cessation recommended that the U.S. Department of Health and Human Services convene a diverse group of experts to ensure that competencies in tobacco dependence interventions be a core graduation requirement for all new physicians and other health professionals (Fiore, 2004b).

Since 2005, the tobacco curricula in U.S. medical schools have been designed, evaluated and published. Hayes et al. have published series of studies that had assessed the following objectives:

1. Factors associated with tobacco cessation counseling in medical school clerkships (Ockene et al., 2015).
2. Factors associated with tobacco dependence treatment teaching by medical school clerkship preceptors (Geller et al., 2013).
3. Medical school curriculum characteristics associated with intentions and frequency of tobacco dependence treatment among medical students (Hayes et al., 2015).
4. Medical students' tobacco dependence treatment skills (Mazor et al., 2015).
5. Students' tobacco counseling experience prior to starting medical school, and tobacco treatment self-efficacy and knowledge (Xiao et al., 2015).

[2]Participating PACE Survey Schools and number of medical students per school (American Association of Medical Colleges, 2003): Harvard University (831), University of Alabama – Birmingham (684), Boston University (671), Loma Linda University (671), University of California-Los Angeles (669), Case Western Reserve University (661), University of Iowa (637), University of Rochester (446), University of Massachusetts Medical (439), University of South Florida (419), University of Kentucky (389), Dartmouth Medical School (320) (Powers et al., 2004).

6. Rationale and design of the MSQuit (Medical Students helping patients Quit tobacco) in group randomized controlled trial (Hayes et al., 2014).

The second group of studies was based on website self-learning as a mandatory or voluntary tobacco curriculum component in medical schools. Pederson et al. have evaluated a web-based tobacco curriculum that teaches medical students to assist smokers to quit and to counsel non-smoking adolescents not to start smoking (Pederson et al., 2006). Hayes et al. have evaluated the Multi-Modal Education (MME) with a web-based course titled "Building Tobacco Treatment Skills" as one part of intervention, apart from a role-play classroom demonstration, preceptor training and preceptor-facilitated clerkships and clerkship "booster" session (Hayes et al., 2014).

TEACHING MEDICAL STUDENTS ABOUT TOBACCO IN LESS DEVELOPED COUNTRIES

According to the Global Health Professionals Survey (GHPS) report, in a pilot study conducted in 10 developing countries[3] in 2005 among third-year students in four health-profession disciplines (dentistry, medicine, nursing, and pharmacy), 87%–99% of the surveyed students believed they should have a role in counseling patients to quit smoking but only 5%–37% had actually received formal training. The WHO, Centers for Disease Control and Prevention (CDC), and the Canadian Public Health Association (CPHA) have developed the GHPS to collect data on tobacco use and cessation counseling among students in health professions in all the WHO member states (GTSS Collaborative Group, 2005).

According to the surveys conducted by Richmond in 1998 and 2009 year (Richmond et al. 1998, Richmond et al., 2009b) the extent of tobacco education in medical schools varied greatly by United Nations geographic region. The main difference was that medical schools in developed countries were twice as likely to have implemented a specific module on tobacco compared with those in less developed countries (39% vs. 17%). On the other hand, medical schools in less developed countries were twice as likely to provide informal teachings on tobacco (41% vs. 20%). Ten schools in India, Pakistan, Mauritius and Tanzania mentioned the use of the WHO initiative: "World No Tobacco Day" as a day, in which they focused students' attention on the effects of tobacco. The main barriers to introduce tobacco issues into the medical curricula, as reported in less developed countries, were: the lack of political interest in educating the future doctors on tobacco, "smoking culture" within societies, curative not preventive oriented curriculum as well as infectious diseases like HIV, tuberculosis and malaria as priorities of medical education (Richmond et al., 1998, Richmond et al., 2009b).

MODEL OF IMPLEMENTATION THE SMOKESCREEN EDUCATION PROGRAM (SEP) TO CHINA AND OTHER LESS DEVELOPED COUNTRIES

Among the less developed countries, China was used as an example of the complexity of issues involved in introducing a teaching innovation in another culture. China is the world's largest tobacco market with more than one billion people. In China over past 30 years, per capita cigarette consumption has tripled. Women and youth are actively targeted with aggressive cigarette advertising. As a communist government, the Chinese government owns the tobacco industry.

In the same vein, the Richmond et al. survey has reported that 39 of 110 medical schools in China responded, and only three included a specific module on tobacco in their curricula. Fourteen medical schools stated that the lack of appropriate staff training was a major obstacle to including tobacco in the curriculum, while eleven schools reported that members of the teaching staff were smokers (Richmond et al., 2009b).

[3] The GHPS Pilot Study surveyed third-year students from: Albania (dental [57], medical [138], nursing [356], and pharmacy [56]; Argentina Buenos Aires); (medical [348], Bangladesh (dental [205]); Croatia (medical [404]); Egypt (medical) [1,770]); Federation of Bosnia and Hercegovina (nursing) [874]); India(dental[1,499]), the Philippines (pharmacy [1,045]), the Republic of Serbia (Belgrade) (dental [160], medical [218], and pharmacy [118]}, and Uganda (medical [162] and nursing [444] (Tobacco use and cessation counselling: GHPS Pilot Study 2005).

The results from the survey highlighted that there was a great need to improve teaching on tobacco and increase the number of medical schools that teach about tobacco (Richmond, 2004). Following the survey, a national coordinating organization called the Chinese Association on Smoking and Health (CASH) was established and lobbied for change. Subsequent legislation mandated changes including improved education on the health effects of smoking, particularly among young people. In addition, Chinese health leaders played an important role in implementing the tobacco control issues in pre- and post-graduate medical teaching; they recognized the need to train doctors and other health workers in tobacco control.

A Chinese doctor from Shanghai Medical University in China, who studied for her Master of Public Health degree at the UNSW in Australia, worked on adapting the SEP for China. The doctor translated the SEP into Mandarin, made it culturally appropriate, and discussed the SEP's appropriateness and value for teaching in the medical curriculum in four medical schools. The important activity was a collaboration with a key representative from the Department of Public Health in the Ministry of Health, China and a professor of public health at the Shanghai Medical University, who helped to promote the SEP implementation. The Public Health professor encouraged his colleagues from other medical schools to participate in the workshops and incorporated the SEP into the medical textbook for the 5th year medical students (Richmond, 2004).

Over a decade ago, besides China, the SEP was disseminated globally and partly implemented in university-based medical schools in 57 less developed countries (Hayes et al., 2014).

TEACHING MEDICAL STUDENTS ABOUT TOBACCO IN POLAND

In Poland in the early 70s, epidemiological studies revealed that Polish men had the highest tobacco consumption in the world. From 1974 to 1982 smoking prevalence among women had increased from 20 to 30 percent (Jassem et al., 2014). Polish tobacco control advocates with the International Union Against Cancer (UICC), the WHO, and health experts from Finland and the United Kingdom built a tobacco control movement in Poland (World Health Organization, 2004).

Systematic studies on smoking and cancer epidemic in Polish population were carried out. In 1989, tobacco control legislation was prepared at the Maria Sklodowska-Curie Cancer Institute and the Central and Eastern European Tobacco Control Institute in Warsaw, in collaboration with the U.S. Centers for Disease Control and Prevention, the Advocacy Institute of the United States and WHO. The conference, *A Tobacco-Free New Europe* was held in 1990 in Poland. This conference led to the creation of the Polish Health Promotion Foundation with the mission of enacting tobacco control legislation. Each autumn the Foundation funds "The Great Polish Smoke-Out", the largest public health campaign in Poland (World Health Organization, 2004).

"Legislation is at the heart of effective tobacco control" (Ockene et al., 2015). In Poland the tobacco control legislation was first enacted in 1995, then amended and strengthened in 1999 and 2010. In 2006, the Framework Convention on Tobacco Control (FCTC) was ratified by the Polish Parliament Poland where the WHO referred to the comprehensive legislation as "an example to the rest of the world" (World Health Organization, 2004).

Positive effects of Polish law were apparent; the number of smokers reduced from 62% of adult men at the end of the 1970s to 37% in 2010, and from 30% of adult women to 24%. The upward trend in mortality from lung cancer in the 1980s was reversed; by the end of the 1990s mortality had decreased by about 20% compared to the peak level (Jassem et al., 2014). These results were obtained despite the strong opposition from the tobacco industry.

Polish model of teaching medical students about tobacco was built simultaneously with enacting and implementing the tobacco control law. According to the WHO experts of tobacco control legislation, successful advocacy for tobacco control requires not only knowledge and resources, but also passion. One of the keys to success is the involvement of leaders whose commitment to tobacco control is personal, heartfelt, and unshakeable (Ockene et al., 2015). In Poland, key leaders and experts from medical universities or health research centers came together and combined commitment with knowledge, wisdom, imagination, courage, and tenacity.

Three key projects for teaching on tobacco in Polish medical universities were started between 1996 and 2000, managed by experts and involved tobacco control initiatives.

In the early 1990s, Poland joined the countries implementing the CINDI (Countrywide Integrated Non-communicable Intervention) WHO Program. The Department of Social and Preventive Medicine at the Medical University of Lodz (MUL-CSPM) was the coordinating center for the WHO CINDI Program in Poland (Fundaçao Prof. Fernando de Pádua, 2016). Every two years, between 1996 and 2006, Poland was a partner of the worldwide Quit and Win competition, organized by the MUL-CSPM/, and coordinated by the National Public Health Institute (KTL) in Helsinki (Finland) (Broszkiewicz et al., 2000).

Since 1998 year, each autumn, the Venulet Scientific Conference "Tobacco or Health" has been organized by the Health Promotion Foundations, with the leading role of Maria Sklodowska-Curie Cancer Institute in Warsaw.

Since 2000 year, the Scientific Conference "Tobacco Smoking in Relation to Concomitant Addictions" has been organized annually by the Poznan University of Medical Sciences (PUMS).

Each of the scientific initiatives mentioned above were, and some still are, the important "stages" for building the national tobacco-free coalition in Poland, getting medical students to pay attention to tobacco issues and showing academic faculty how to teach medical students about tobacco.

OBJECTIVES

In order to be a part of the worldwide coalition in teaching medical students about tobacco, since 2008 the Medical University of Lodz, Department of Preventive Medicine (MUL-DPM Poland) has started developing a specific module on tobacco in the sixth year medical students' curriculum.

This paper's objective is to review the history of global efforts made to teach medical students about tobacco, including active and passive tobacco smoking. We recognized the main country/national teaching models in Australia and in the USA, and dissemination and implementation of the Australian SEP model into other less developed countries, for example in China.

Specifically, this paper aims at:

- reviewing the curricula content, especially objectives and interventions to reduce SHS in patients;
- recognizing whether the 5A's brief intervention for passive smokers and MAD-TEA action (Meet, Ask, Declare, Talk, Encourage, Advocate), recommended by the WHO since 2013, were introduced into tobacco curricula in medical schools;
- demonstrating Polish DPM-MUL model of teaching tobacco to the fifth and sixth year medical students;
- testing whether independent variables (student gender and year at university) relate to marks of students after completing the course;
- recommending the DPM-MUL tobacco teaching model, the 5A's brief intervention for passive smokers and MAD-TEE action to be introduced into medical schools' curricula;
- getting the academics and deans to pay attention to an urgent necessity to introduce reduction of SHSe in patients, into the tobacco curricula in medical schools.

To the best of our knowledge, this paper is the first one to describe implementation of 5A's brief intervention for passive smokers and MAD-TEA action, into the tobacco control curriculum at the medical university.

1. Materials and Methods

1.1. Design

The DPM-MUL Tobacco Control course is a part of the Public Health curriculum for medical students developed by the Department of Preventive Medicine at the Medical University of Lodz.

1.1.1. Conceptual Approach

The DPM-MUL Tobacco Control course was based on the assumption that there are two groups of strategies regarding to tobacco control: (1) in active tobacco use: strategies that include both reducing tobacco initiation, and increasing tobacco cessation; (2) in second-hand tobacco smoke exposure: strategies that include both protecting from exposure to SHS, and reducing exposure to SHS (Figure 1). The interventions developed within each of four strategies are based on evidence-based guidelines and are implemented on both population and individual levels.

The comprehensive tobacco control curriculum for medical students should include the components from each of the four strategies. The DPM-MUL Tobacco Control course meets these assumptions.

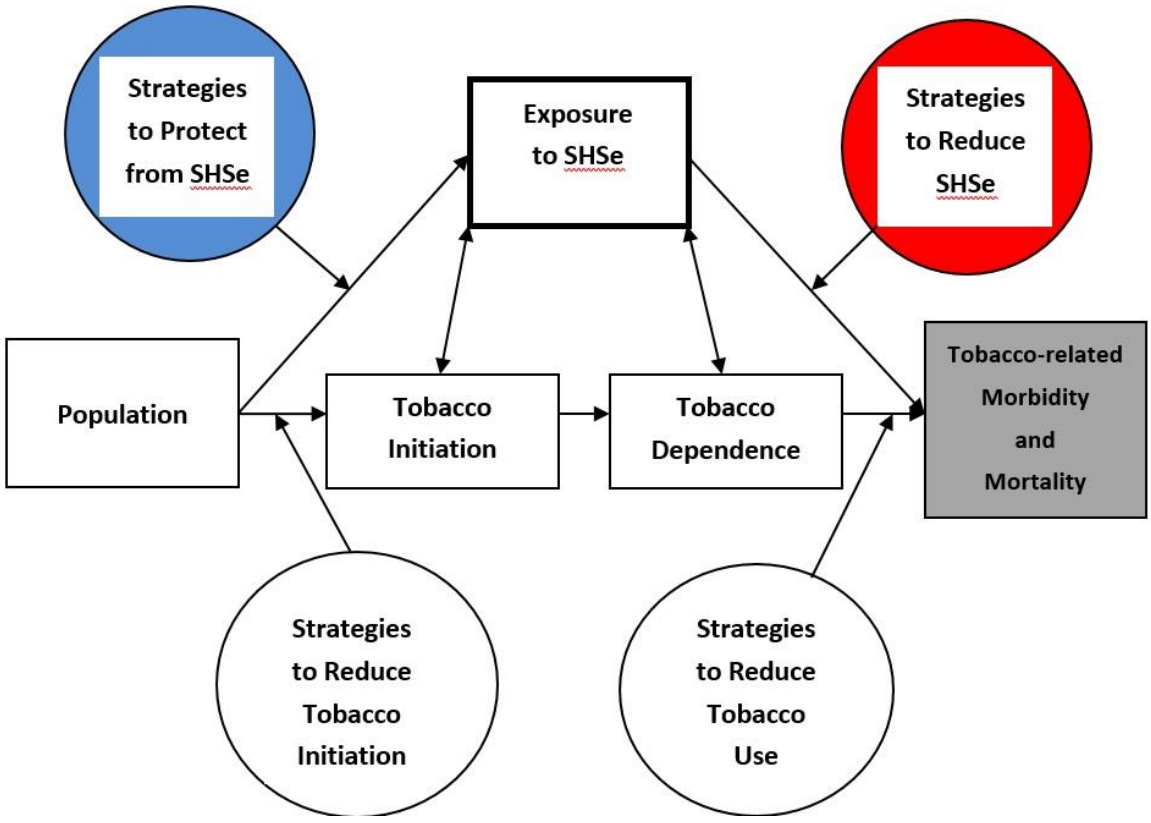

Figure 1. Framework of Strategies to Reduce Tobacco Use and Exposure to SHS.

Note: In 2001 *Strategies to Reduce Exposure to SHSe* (red-coloured) were recognised as the same as *Strategies to Protect from Exposure to SHSe* (blue-coloured) and were as one group of strategies on the left side of framework. In 2001 there was not recognised yet the 5A's brief intervention for passive smoker provided by health professionals, as an example of strategy to reduce exposure to SHS (Hopkins et al., 2001).

1.1.2. Developing and implementing the DPM-MUL Tobacco Control Program into Curriculum

Four stages in developing and introducing the DPM-MUL Tobacco Control Program into curriculum, as the specific module on tobacco, have been recognized:

1. First stage: from 1993 to 2007, when tobacco issues were taught while teaching other subjects or by systematically integrating tobacco teaching into other modules[4].
2. Second stage: from 2008 to 2013, specific modules on tobacco were developed with content that focused on active smoking including: smoking prevalence and tobacco-related diseases in adults; nicotine dependence measurement; smoking cessation brief intervention 5A's; pharmacological treatments (NRT); Quit & Win contest. These modules were incorporated into the sixth-year medical students' curriculum'.
3. Third stage: from 2014 to 2017, new academic staff with extensive experience in tobacco control got involved in teaching, and the module on tobacco was extended to include interventions on protection and reduction of SHS.
4. Fourth stage: from 2018 till date, the previous tobacco module is still being used and based on the faculty dean's decision, tobacco teaching has been moved from sixth to second year students.

1.1.3. Academic Staff Resources

At all stages, the strongest part of the DPM-MUL Tobacco Control Course were the teaching staff resources. All of four academics, who have been involved in the teaching process since 2014 year are experienced in different tobacco control issues (legislation, prevention, treatment, Quit & Win contest).

1.1.4. MUL-DPM Tobacco Control Program

PROGRAM STRUCTURE AND EDUCATIONAL FORMATS

The Program consists of four parts:

1. Part 1 (mandatory, with a teacher's presence/participation) is a 2-hour lecture, titled *Global tobacco epidemic and tobacco control according to different models* (Broszkiewicz and Drygas, 2016).
2. Part 2 (mandatory, with a teacher's participation) is a 5-hour four-part communication tutorial/seminar, in groups of 20-24 medical students, and includes various educational formats: group discussion, assigned class readings and/or translations; student presentations; use of film, clip, advertisement to trigger discussions; case study discussions and problem-based learning exercise, e.g. intervention of smoke-free home restrictions.
3. Part 3 (mandatory, without a teacher's presence) is a 2-hour self-learning that includes assigned readings for homework.
4. Part 4 (optional) is a 2–3-hour e-learning that includes the website based certified course *Learning from the Experts: A Course for Healthcare Professionals* by the Institute for Global Tobacco Control at the Johns Hopkins Bloomberg School of Public Health.

[4] The first academic staff teaching tobacco at the Medicine Academy in Lodz (Poland) in the Chair of Social and Preventive Medicine, consisted of four teachers: Dr J. Lewandowicz, Dr A. Gerstenkorn, Dr W. Goralczyk, Dr M. Suwala in 1996 year the first manual for medical students was published (Gerstenkorn and Suwala, 1996).

PROGRAM CONTENT IN GENERAL

The Program was divided into four parts:

1. Basic sciences approach to tobacco smoke and health harms of tobacco use.
2. Clinical approach to assessment and treatment of tobacco use.
3. Clinical approach to assessment and reduction of SHSe.
4. Public health advocacy and population sciences approach to tobacco control.

The comprehensive approach of the basic and clinical sciences, and the public health advocacy sciences to reduce the harms associated with active and passive smoking and to tobacco control, can ensure that the program meets the WHO recommendations. Some of these recommendations include: strengthening health systems for treating tobacco use and dependence, and delivering brief interventions by the future medical doctors (World Health Organization, 2013a; World Health Organization, 2013a).

PROGRAM CONTENT: INTERVENTION AND ACTION IN REDUCTION OF SHSE

To build capacity for tobacco control and strengthen health system for treating tobacco use and dependence, in 2013-14 years the World Health Organization published training for care providers with a useful toolkit for delivering the 5A's and 5R's brief tobacco interventions. It was the first time that the 5A's brief intervention for passive smokers and the MAD-TEA (Meet, Ask, Declare, Talk, Encourage, Advocate), six-point action to assist patient in avoiding exposure, were included in the training package and recommended by WHO. Both the 5A's brief intervention for passive smokers, and the MAD-TEA action were included into the DPM-MUL Tobacco Control Program (Figure 2, Table 1).

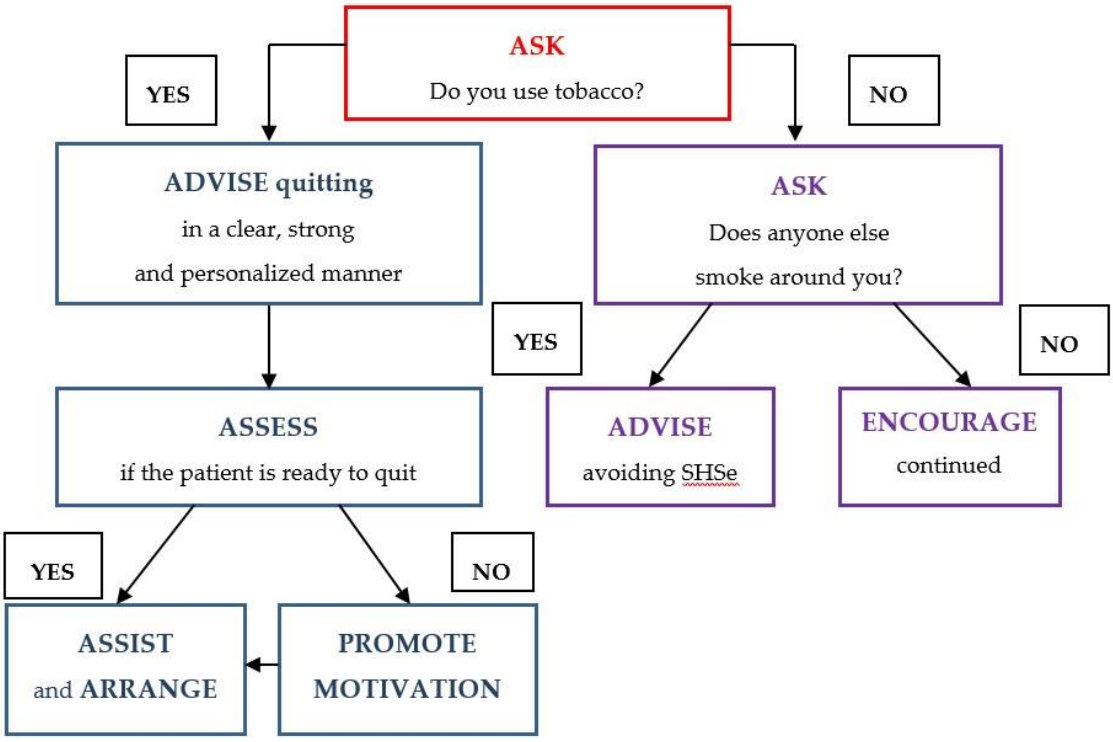

Figure 2. Algorithm for delivering brief tobacco interventions (WHO, 2014).

Table 1. The 5A's brief tobacco intervention for reducing exposure to SHS (WHO 2014).

5A's	Action	Strategies for implementation
Ask Systematically identify non-smoking patients who are exposed to SHS at every visit	Ask ALL of your non-smoking patients at every encounter if they are exposed to SHS. Make it part of your routine.	Keep it simple. For example: "Does anyone else smoke around you?" Countries should consider including the information on SHS in all medical notes.
Advise Persuade the patient to avoid exposure to SHS	Educate every patient who is exposed to SHS about the dangers of SHS and advise them to avoid it.	Your advice should be clear, positive, and tailored to that specific patient's characteristics and circumstances. For example, *There is no safe level of exposure, it is important that you avoid exposure to SHS, which may dramatically reduce e your respiratory symptoms*.
Assess Determine the patient's willingness to reduce exposure to SHS	Assess if the patient is willing to reduce his or her SHS or not. Assess where the patient is exposed to SHS and whether there is a possibility to reduce the patient's exposure.	Have your patient list off all the common places where they can be around secondhand smoke. Common examples include: • place of employment, • restaurants, • bars, • home, • recreational settings. Encourage your patient to assess the possibility of reduce exposure to SHS in each place. Some places, for example, exposure to SHS at home, the patient would have a high possibility to reduce exposure by encouraging his or her family to quit or to smoke outside.
Assist Help the patient in making an attempt to make his or her daily life environment smoke-free	Assist your patient in developing an action plan to reduce their exposure to SHS.	Use MAD-TEA to help your patient plan what they can do: • meet their friends at spaces in the community that are smoke free, • ask family members and visitors to smoke outside, • declare their home and personal spaces (e.g. their car) to be smoke free, • talk to family members and people they work with about the risks of secondhand smoke, • encourage family members, friends, and workmates who smoke to stop, • advocate comprehensive smoke-free laws or regulations in workplaces and public places.

Table 1 cont.

Arrange Schedule follow-up contacts	Arrange a follow-up contact after around one week to provide necessary support.	When: The first follow up contact should be arranged after one week. How: Use practical methods such as telephone, personal visit and mail/ email to do the follow up. Following up with patients is recommended to be done through teamwork if possible. What: • congratulate them on their success if the patients have reduced exposure, • identify problems already encountered and anticipate challenges, • provide necessary support, • schedule next follow up contact.

INTERNET-BASED COURSE FOR HEALTH PROFESSIONALS

The website course was developed by faculty at the Johns Hopkins Bloomberg School of Public Health and it takes two to three hours to complete. Any medical student who completed the course received a certificate of completion from the Institute for Global Tobacco Control at the Johns Hopkins Bloomberg School of Public Health.

The course is divided into five lectures:

1. Introduction and statement of course goals.
2. Tobacco consumption.
3. Best practices in international tobacco control.
4. Helping people quit tobacco.
5. Involving health professionals in tobacco control.

Each lecture contains a series of slide lectures with accompanying audio, a downloadable PowerPoint files (Learning from the Experts…).

PROGRAM OBJECTIVES AND COMPETENCIES

The learning objectives include: affective, cognitive, and skills objectives. Affective objectives (A) for comprehensive tobacco control curriculum should include student' beliefs in:

1. Crucial physician's role in tobacco active and passive smoking prevention, assessment and treatment/reduction, and in public health advocacy.
2. Patients' expectancies to be counselled about smoking and SHSe.
3. Tobacco cessation advice/patient-centered counseling as a learned and a highly effective skill.

Moreover student should realize that:

1. Tobacco dependence is a chronic condition, that often requires repeated interventions.
2. Smoking cessation is a process, and not all smokers are successful on first attempt[5].

Competencies in cognitive and skill objectives were organized according to three competency areas:

1. Competencies of prevention, assessment and cessation of tobacco use in adult and pediatric populations.
2. Competencies of assessment and protection from, and reduction of SHSe in adult and pediatric populations.
3. Public health advocacy/population sciences competencies.

[5] DPM-MUL Program Objectives and Competencies were built on the experiences of the Prevention and Cessation Education Consortium funded by the National Cancer Institute (USA) that is described in paper in the Introduction (Geller et al., 2007).

1.1.5. Assessment methods of student knowledge and skills

A student' participation and activities in mandatory parts of the program (lecture and tutorial/seminar) and in voluntary web-based course were awarded points.

To increase his/her score, a student could prepare an independent learning project in an essay or presentation form, with topics related to health professionals' roles in tobacco control or reducing tobacco-related harms and SHSe, or translating form from English to Polish language, e.g. the MAD-TEA action for passive smoker.

A Student whose score was below a threshold was obliged to take a written exam consisting of multiple choice and short answer questions; the grading scheme was the following – 5.0 (Excellent), 4.5 (Very Good), 4.0 (Good), 3.5 (Satisfactory), 3.0 (Sufficient), 2.0 (Failed).

1.1.6. Study hypotheses

The following study hypotheses are tested in the paper:

1. The content, length and forms of the tobacco control course and assessment methods of students' knowledge and skills were well-tailored to the fifth and sixth year medical students. To confirm the hypothesis, a minimum of 90 percent of students had to complete the course.
2. Students' gender was in relation to the marks received after completing the tobacco control course. It means, that difference in mark between men and women was statistically significant.
3. Students' year at university was in relation to the marks received after completing the tobacco control course. It means, that difference in mark between students of fifth and sixth year was statistically significant.

1.1.7. Methods of data analysis

All data was stored on secure server at the Medical University of Lodz and was exported into STATISTICA v.13.1 (Dell Software, MUL, Poland) for analysis. Descriptive statistics are presented as numbers and percentages for categorical variables, and means (standard deviation, SD) or median (quartile 1, quartile 3) for continuous variables, depending on the distribution of the data. Frequency tests were used to compare the statistical significant difference between the two gender groups.

The binary analysis models with non-parametric U-Mann–Whitney test for two independent samples were used to examine student characteristics (gender, year of study) in relation to the marks received after completing the MUL-DPM Tobacco Control course. P-values were calculated for variables in the models with statistical significance of $p < 0.05$.

Statistical analyses were carried out with STATISTICA v.13.1, core: JPZ701E504330AR-B on the computer (code: 00330-50107-87073-AAOEM.) with Windows 10 Pro Microsoft Corporation.

2. Results

2.1. Students characteristics

A total of 915 medical students (652 students from the last semester of the graduation year, and 263 students from the ninth semester) participated in the DP-MUL Tobacco Control course in 2015–2017. There were 224 students in 2015, 509 students in 2016, and 182 students in 2017. In general, there were more female students (60.8%) than male students ($p < 0.001$).

2.2. Students according to participation in mandatory and optional parts of the course

To be considered, all of 915 medical students were obliged to participate in the mandatory parts of the course. Each of 41 tutorial/seminar groups consisted of 20-24 students. The students' participation in the JHBPHS web based course, which was optional, was very high each year (94–98.4%), according the JHBPHS certificates.

Characteristics of the entire sample are presented in Table 2.

Table 2. Medical students who completed Public Health course according to DPM-MUL Tobacco Control program in years 2015-17 according to year/semester, gender, tutorial group, and JHBSPH certificate (n=915).

Year	MUL* year/semester	Students	Gender (%female)	Tutorial groups	JHBSPH** certificates	Certificates (%)
2015	$6^{th}/12^{th}$	224	64.7	10	215	96.0
2016	$6^{th}/12^{th}$	246	58.1	11	242	98.4
2016	$5^{th}/9^{th}$	263	64.6	12	252	95.8
2017	$6^{th}/12^{th}$	182	53.8	8	171	94.0
Total	X	915	60.8	41	880	96.2

*__MUL-DPM__ – Medical University of Lodz (Poland), Department of Preventive Medicine; **__JHBSPH__ –John Hopkins Bloomberg School of Public Health

2.3. Students according to the mark after completing the tobacco control course

All of 915 medical students completed the tobacco control course with positive mark. Nearly 2/3 students had 5.0 (Excellent) and 4.5 (Very Good), 39% and 25.3%, respectively. Nearly each third student (30.3%) had mark 4.0 (Good). Only 5.4% of total students had 3.0 (Sufficient) and 3.5 (Satisfactory).

The students' marks based on gender are include in Table 3 for entire sample and in Table 4 for subsample of the sixth year students in 2015.

Table 3. Medical students (total sample) according to gender of and mark after completing Public Health course with MUL-DPM Tobacco Control program in years 2015–2017 (n = 915).

Mark	Women	%	Men	%	Total	%
5,0	223	40.1	134	37.3	357	39.0
4,5	139	25.0	93	25.9	232	25.3
4,0	170	30.6	107	29.8	277	30.3
3,5	15	2.7	15	4.2	30	3.3
3,0	9	1.6	10	2.8	19	2.1
Total	556	100.0	359	100.0	915	100.0

Table 4. Medical students (6^{th} year 2015 subsample) according to gender and mark after completing Public Health Course with DPM-MUL Tobacco Control Program (n = 224).

Mark	Women	%	Men	%	Total	%
5,0	28	19.3	5	6.3	33	14.7
4,5	37	25.5	19	24.1	56	25.0
4,0	61	42.1	38	48.1	99	44.2
3,5	11	7.6	11	13.9	22	9.8
3,0	8	5.5	6	7.6	14	6.3
Total	145	100.0	79	100.0	224	100.0

The medical students' according to mark and year at university for entire sample are in Table 5.

Table 5. Medical students (total sample) according to year of study at university and mark after completing Public Health course with MUL-DPM Tobacco Control program in years 2015–2017 (n = 915).

Mark	5th year	%	6th year	%	Total	%
5,0	163	62.0	194	29.8	357	39.0
4,5	27	10.3	205	31.4	232	25.3
4,0	68	25.8	209	32.1	277	30.3
3,5	3	1.1	27	4.1	30	3.3
3,0	2	0.8	17	2.6	19	2.1
Total	263	100.0	652	100.0	915	100.0

In the light of the results shown above, the first study hypothesis suggesting that the tobacco control course was well-tailored to fifth and sixth year medical students is true. All the sampled students completed the course.

2.4. Students' gender in relation to the marks received after the tobacco control course completion

The second study hypothesis, tested in the paper, suggests that students' gender was in relation to the marks received after the tobacco control course completion. The difference between the male and female students' marks men was statistically significant. This hypothesis was tested both in the entire study sample includes medical students who completed the tobacco control course in years 2015–2017, and in the subsamples of students in each year, separately.

The only statistically significant difference in marks between men and women, tested by the U-test, was found in subsample of the sixth year medical students in 2015 year ($p < 0.008$). In this subsample mean marks were 4.228 (SD 0.530) and 4.038 (SD 0.485) in women and men, respectively.

Based on the aforementioned results, the second study hypothesis was false in the entire study sample.

2.5. Students' year at university in relation to the marks received after the tobacco control course completion

The third study hypothesis suggests that students' year at university was in relation to the marks received by the students following the tobacco control course completion. The difference in marks between students of fifth and sixth year was statistically significant.

This hypothesis was tested only in the entire study sample and it proved true. The difference in marks between the fifth- students and sixth-year students, tested by the U-test, was highly statistically significant ($p < 0.0000001$).

In the entire sample, the mean marks were 4.658 (SD 0.473) and 4.408 (SD 0.496) in the fifth and sixth-year students, respectively. The summary statistics are in Table 6.

Table 6. Summary Statistics (2015–2017).

Variables	Mark			
	Mean	SD	U-Mann–Whitney Test	
			Z	p-value
Mark (general)	4.48	0.50		
Gender (6th year students 2015)			2.618	0.008
Women	4.23	0.53		
Men	4.04	0.49		
Gender (6th year students 2016)			-0.400	0.688
Women	4.61	0.47		
Men	4.62	0.49		
Gender (6th year students 2017)			-0.023	0.981
Women	4.43	0.33		
Men	4.44	0.31		
Gender (5th year students 2015)			-0.087	0.930
Women	4.67	0.44		
Men	4.63	0.53		
Gender (students 2015–2017)			1.022	0.306
Women	4.50	0.49		
men	4.45	0.52		
Year of study			7.161	0.0000001
5^{th} year	4.66	0.47		
6^{th} year	4.41	0.50		

Note: The summary statistics were calculated using all the years in the study period as well as for each year separately.

3. Discussion

Given that the DPM-MUL Tobacco Control Program is published for the first time and that the study population was quite homogenous according to age, the authors decided to focus on presenting the details of the program rather than finding relations between different variables.

The DPM-MUL Tobacco Control curriculum, which was extended in 2014 by adding a clinical approach to assessment and reduction of SHS, seemed well-tailored to the fifth and sixth-year medical students. The students completed the course effectively, most of them getting “excellent” and “very good” marks.

The only difference was between subsample of the sixth year students in 2015, and the rest of entire sample. The students’ marks in this sixth-year subsample was poorer in general, both in the men, and women than in other subsamples. These poor marks may explain why there was a highly statistically significant difference in mark between the fifth and sixth year-students. Probably, the new components in the curriculum increased the course difficulty for the sixth-year medical students; the course may be assumed to be best tailored to the fifth-year medical students.

In the last five years or more, there have been no new projects and researches on teaching medical students about tobacco. After Richmond’s, Power’s, Geller’s et al.’s studies, mentioned earlier, there have been no new studies on teaching medical students about tobacco; probably researchers have asked and answered all the questions on this matter.

Studies in the past two to three decades investigated teaching tobacco in medical schools with a focus on active tobacco use, and hardly on exposure to SHS (Geller et al., 2005; Geller et al., 2007; Geller et al., 2013). The paper answers the question on how to teach medical students not only clinical approaches to assessment and treatment of tobacco use, but also clinical approaches to the assessment and reduction of SHSe.

Since 2013, when the WHO Prevention of Non-communicable Diseases published a training package for primary care providers for the first time, to strengthen capacity building for tobacco control (World Health Organization, 2013a), there was no new intervention. Until the Medical University of Lodz in Poland, Department of Preventive Medicine included new interventions into tobacco control curriculum for medical students. These interventions were two separate 5A's brief interventions for active and passive smokers and six-step MAD-TEA action for those, who are ready to create smoke-free environments. Including a brief intervention of 5A's for passive smokers into tobacco control curricula in medical schools should not be postponed any longer. Teaching medical students about the role of doctors of the future, should not only include tobacco smoking cessation, but also reducing exposure to SHS in patients and it should be a mission of each medical school all over the world.

While it is estimated that about 80% of adult population visits physician at least once a year, and more than 90% of growing-aged population visits pediatricians annually (World Health Organization, 2013a). "Teaching about smoking cessation in medical schools is a potentially powerful means of spreading information and influence about the ill effects of tobacco use throughout the global community. There is no area of medical education and preventive medicine in which emphasis on cessation of smoking will yield greater returns in better health, saved lives and reduced medical costs" (Richmond and Taylor, 2006, p. 754).

In the previously cited paper, there is no mention of reducing SHS exposure to be taught to these medical students. Nevertheless, in similar period (2004–2005), Powers and Geller, leading experts participating in the tobacco curricula reform for U.S. medical schools, highlighted a "deficiency" in the existing curricula; no training on Environmental Tobacco Smoke (ETS) for physicians who care for children and families, and they called for a need to include it (Powers et al., 2004).

As the result of the curricular reform, the first Tobacco Control Competencies for U.S. Medical Students were articulated. Among all the seventy eight objectives, there were four cognitive (C) and skill (S) objectives, in four different competency areas in relation to SHSe. These were:

In: Adult cessation and prevention (epidemiology and disease causation):

(S) Student should be able to explain the risks of environmental tobacco smoke for people other than the smoker with a special emphasis on people living in a smoker's household.

In: Pediatric prevention and cessation (epidemiology):

(C) Student should understand the major risks of environmental tobacco smoke exposure to children in the household; (S) Student be able to perform patient-centered counseling with at least 3 parents regarding the effect of smoking on their children.

In: Support systems in clinical/medical setting:

(C) Student should be aware of organizational policies in medical offices and clinics that support tobacco-free goals (e.g., smoke-free policies that maintain smoke-free environments; "no smoking" signs posted visibly; and public information pamphlets available in easy-to-read formats).

As it was mentioned partly in *Materials and Methods*, the MUL-DPM Program Objectives and Competencies were built on the experiences of the Prevention and Cessation Education Consortium, led by Powers and Geller.

Taking into account above competencies, it is safe to establish the mid-90s as well-documented start when SHSe issues were introduced as specific module into tobacco curricula in medical schools.

To meet the paper aims, we recommend the DPM-MUL teaching model with the 5A's brief intervention for passive smokers and MAD-TEE action to be introduced into the medical schools' curricula. In addition, we urge the academics and deans to pay attention to the critical necessity of introducing SHS reduction in patients into tobacco control curricula in medical schools.

We can find information on 'How to change/reform tobacco curricula' in the experts' "prescriptions"; Robyn Richmond, an Australia expert, recommends "Strategies to successful implementation and sustainability of tobacco curriculum", which include:

1. Importance of key person interested in introducing a tobacco curriculum into medical schools.
2. Important to have an identified person**,** who teaches the tobacco curriculum.
3. Preferable for the person teaching the tobacco curriculum to attend a training workshop to learn the tobacco curriculum.
4. The medical school dean is interested in implementing a tobacco curriculum (Hayes et al., 2014).

The DPM-MUL Tobacco Control Curriculum fulfils all of four strategies listed above. Studies and experiences confirm, that teaching staff resources were the strongest factor of building and developing the DPM-MUL curriculum at all stages.

Catherine Powers and Allan Geller, the American experts, emphasized, that tobacco curriculum must be reformed in two connected ways:

1. Students and academic leaders should work together to weave a new tobacco curriculum into existing courses and modules. The same way has been done effectively for substance abuse, behavioral counseling and interviewing techniques.
2. The benefits of tobacco cessation counseling should be intertwined into all core curricula; and training for physicians and medical students should center on the following motivational points:
   - many patients are quitting, and clinical interventions can be remarkably successful,
   - patients expect their physicians to counsel them about smoking,
   - tobacco dependence is a chronic condition that often requires repeated interventions (Geller et al., 2005).

Introducing the need to reduce SHSe into tobacco control curricula sets new challenges, including new important role assigned health professionals to assist patients in reducing exposure to SHS, (especially at homes), and creating home smoking restrictions (HSRs), to protect vulnerable populations (infants, small children, pregnant women) in particular.

Systematic reviews have demonstrated that individual counselling increases cessation rates (Lancaster and Stead, 2017), and simple advice from a physician may have a positive effect in triggering quit attempts (Stead et al., 2013). In relation to children's exposure in utero and during the early years, smoking cessation interventions for pregnant women can be effective in reducing smoking (Chamberlain et al., 2017, Collins et al., 2015). Although smoke-free legislation in England has contributed to the 79% reduction in children's SHSe since 1998 (Jarvis and Feyerabend, 2015), variability is ongoing, and children in families from lower socioeconomic status remain at greater risk of SHSe (Moore et al., 2012).

Hovell MF et al. from nearly thirty years have explored interventions of behavioral medicine designed to reduce asthmatic children's exposure to SHS (Hovell et al., 1994) and tested RCT model interventions among low socio-economic populations to find most effective interventions to decrease child's exposure to SHS in the households (Baheiraei et al., 2011; Collins et al., 2015; Hovell et al., 2009). Home and car smoking bans implemented by caregivers are important approach in reducing children's SHSe and attendant health risks (Ding et al., 2011).

Anti-tobacco initiatives outside the clinical settings, including: legislative, policy, media, partnership building support reduction to SHSe. Exposure to California's antismoking policy and culture was associated with stronger home smoking restrictions and improved effectiveness (World Health Organization, 2000).

Smoke free public places seem to stimulate adoption of smoke-free homes, a strategy associated with both increased frequency of quit attempts and of success of those attempts (Borland et al., 2006).

A recent challenge is third hand smoke (THS), the contamination that persists after secondhand tobacco smoke has been emitted into air. Third hand smoke is not strictly smoke, but chemicals that adhere to surfaces from which they can be released back into the air, undergo chemical

transformations and/or accumulate. Currently, the hazards of THS are not as well documented as the hazards of SHS. But in the future researchers will conduct studies of environmental contamination by THS, human exposure and toxicology studies using animal models and in vitro systems, possible approaches for avoiding exposure, remediation of THS contamination, and priorities for further research (Jacob et al., 2017).

Considering the JHBPHS web-based course for health care professionals has been a part of the DPM-MUL Tobacco Control course, since 2013, web-based curricula have been used to teach medical students about tobacco control more often than other methods. (Learning from the Experts…). According to Pederson "this curriculum addressed some of the barriers, namely lack of curriculum time, lack of access to materials and experts."(Pederson et al., 2006, p. 39). On the one hand, we do agree with Pederson's statement that the website curriculum has the learning format only, without teaching. But on the other hand, we disagree considering the website course is one part of comprehensive tobacco curriculum, as it is in the DPM-MUL curriculum. Regardless, the course was optional and lasted 2–3 hours, the participation indicator was very high in the entire sample (96.2%) and also in each of the four students' subsamples. It seems the medical students were highly motivated to participate in the course. Each student's participation has a positive effect on their mark after completing the course.

3.1. Strengths and Weaknesses in Relation to other Studies

There have been few similar studies that tested tobacco curricular changes.

Generally, our study does not differ considerably from others in the field as it simply assessed how a modified course works, but it differs from others in the subject of curricular change, which is fundamental for global health, and strongly recommended by the WHO, in particular teaching medical students about SHSe.

3.2. Implications for other medical schools

As discussed earlier, teaching medical students about tobacco should be a general mission for medical schools all over the world. But teaching medical students, the physicians of the future, about SHSe should be a duty of each medical school. This duty is vital since vulnerable patients, including infants, small children, pregnant women, old aged women are not able at all or partly only, to reduce their exposure to SHS.

Following this publication, the authors hope that the medical schools will get tools and materials for teaching; easily accessible in some foreign languages, not only in English, and at the WHO and JHBPHS webpages. In addition, as authors, we declare consultation proposals via email box.

3.3. Unanswered Questions and Future Research

Only one age group of the fifth year medical students, who completed the DPM-MUL tobacco control course, whose marks were better than sixth year medical students, was included into study. This result was too suggestive. If it will be possible, we will observe, whether student' mark relates to his/her year at university. It will be observed next years whether the course fits better to sixth or to fifth year, or may be to the lower year at university. But it depends on the MUL Medical Dean decision on which year at university we will teach medical students about tobacco.

The next step after evaluating and publishing the DPM-MUL Tobacco Control course should be its dissemination into other medical schools in Poland and in other countries, mainly less-developed, where tobacco use and SHSe in populations are much higher. There is a published dissemination model of the Smokescreen Education Program (SEP) developed in the School of Public Health and Community Medicine at University of New South Wales in Australia, what was mentioned in the Introduction part.

In the past twenty years or longer the Tobacco Prevention Section of the IUATLD (International Union Against Tuberculosis and Lung Disease) stimulated teaching about tobacco in medical schools through its series of studies conducted among medical students and in medical schools. Now, two decades later may be time to repeat these studies to stimulate teaching about reduction of SHSe in medical schools.

Conclusions

Using the data on completing by the medical students the DPM-MUL Tobacco Control course during the 2015–2017 period we investigated relation between student achievement, including mark as an indicator of difficulties of the course as well as a gender, and a year at the university. The observational study was conducted after extending the course by adding new interventions of clinical approach to assessment and reduction of SHSe.

Our paper is also the first one that contains a review of global reforming process of teaching medical students about tobacco that begun about 25 years ago in Australia and in the USA independently.

The next step in global reform of teaching medical students, who will be the doctors of the future, about tobacco is needed to disseminate and implement into curricula not only the brief intervention 5A's for tobacco using patients but also brief intervention 5A's for those who are exposed to SHS and will create smoke-free environments, as it is recommended by WHO.

Our study confirm the results of other previous research that tobacco control leaders in medical schools play crucial role in developing and introducing tobacco issues into the curricula. Their efforts should be supported by further tobacco control capacity building. We agree with other tobacco control leaders, that failure in implementing available knowledge about chronic disease prevention and tobacco control will endanger future generations.

Acknowledgments: The funds for covering the costs to publish in open access come from Medical University of Lodz statue source of finance. We would like to acknowledge Prof. Adam Fronczak who participated in the project as a teacher, and Prof. Malgorzata Pikala for advising on and assisting with data analysis.

Author Contributions: M.B. led data collection, analyzed the data, wrote the paper; M.B. D.K. and K.P. co-authored the teaching tools on tobacco control at DPM-MUL; D.K. and K.P. commented on the draft and intellectually contributed to the development of the final manuscript. W.D. contributed to the concept development. All authors approved of the final manuscript.

References

Baheiraei A., Kharaghani R., Mohsenifar A., Kazemnejad A., Alikhani S., Milani H.S. Mota A., Hovell M.F. 2011. Reduction of secondhand smoke exposure among healthy infants in Iran: randomized controlled trial. *Nicotine Tobacco Res*earch 13(9), pp. 840–847. DOI: 10.1093/ntr/ntr085.

Borland R., Yong H.H, Cummings K.M., Hyland A., Anderson S., Fong G.T. 2006. Determinants and consequences of smoke-free homes: findings from the International Tobacco Control (ITC) Four Country Survey. *Tobacco. Control* 15(Suppl 3), iii42–50. DOI: 10.1136/tc.2005.012492.

Broszkiewicz M., Drygas W. 2016. Globalna kontrola tytoniu jako przykład dobrej praktyki implementacji strategii i obszarów promocji zdrowia według Karty Ottawskiej. In: Michalak J. (ed.) *Zagrożenia zdrowia publicznego. Część 3. Naukowe podstawy promocji zdrowia*. Wolters-Kluwer, Warsaw. pp. 77–108.

Broszkiewicz M., Suwala M., Drygas W. 2000. *Jak przeprowadzić kampanię antytytoniową „Rzuć palenie i wygraj"*. Akademia Medyczna, Lodz.

Chamberlain C., O'Mara-Eves A., Porter J., Coleman T., Perlen S., Thomas J., McKenzie J.E. 2017. Psychosocial interventions for supporting women to stop smoking in pregnancy. *Cochrane Database of Systematic Review*. DOI: 10.1002/14651858.CD001055.pub5.

Collins B.N., Nair U.S., Hovell M.F., DiSantis K.I., Jaffe K., Tolley N.M., Wileyto E.P., Audrain-McGovern J. 2015. Reducing underserved children's exposure to tobacco smoke: a randomized counseling trial with maternal smokers. *American Journal of Preventive Medicine* 49, pp. 534–544. DOI: 10.1016/j.amepre.2015.03.008.

Crofton J.W., Freour P.P., Tessier J.F. 1994. Medical education on tobacco: implications of a worldwide survey. *Medical Education* 28, 187–196. DOI: 10.1111/j.1365-2923.1994.tb02697.x.

Ding D., Wahlgren D.R., Liles S., Matt G.E., Oliver M., Jones J.A., Hovell M.F. 2011. A second reporter matters: agreement between parents' and children's reports of smoking bans in families. *American Journal of Preventive Medicine* 40(5), pp. 572–575. DOI: 10.1016/j.amepre.2010.12.020.

Doll R., Hill A.B. 1950. Smoking and carcinoma of the lung: preliminary report. *British Medical Journal* 2(4682), pp. 739–748. DOI: 10.1136/bmj.2.4682.739.

Epps R.P., Manley M.W. 1990. How to help your patients stop smoking: a National Cancer Institute program for physicians. *The Journal of the Florida Medical Association* 77(4), pp. 454–456.

Fiore M.C., Bailey W.C., Cohen S.J., Dorfman S.F., Goldstein M.G., Gritz E.R., Heyman R.B., Holbrook J., Jaen C.R., Kottke T.E., Lando H.A., Mecklenburg R., Mullen P.D., Nett L.M., Robinson L., Stitzer M.L., Tommasello A.C. Villejo L., Wewers M.E. 1996. *Smoking Cessation:* Clinical Practice Guideline No 18. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, AHCPR Publication, Rockville.

Fiore M.C., Bailey W.C., Cohen S.J., Dorfman S.F., Goldstein M.G., Gritz E.R., Heyman R.B., Jaén C.R., Kottke T.E., Lando H.A., Mecklenburg R., Mullen P.D., Nett L.M., Robinson L., Stitzer M.L., Tommasello A.C. Villejo L., Wewers M.E. 2000. *Treating Tobacco Use and Dependence.* Clinical Practice Guideline. Department of Health and Human Services, Public Health Service, Agency for Healthcare Research and Quality 2000. AHRQ Publication, Rockville.

Fiore M.C., Croyle R.T., Curry S.J., Cutler C.M., Davis R.M., Gordon C., Healton C., Koh H.K., Orleans C.T., Richling D., Satcher D., Seffrin J., Williams C., Williams L.N., Keller P.A., Baker T.B. 2004a. Preventing 3 million premature deaths and helping 5 million smokers quit: a national action plan for tobacco cessation. *American. Journal of Public Health* 94, pp. 205–211. DOI: 10.2105/ajph.94.2.205.

Fiore M.C., Jaén C.R., Baker T.B., Bailey W.C., Benowitz N.L., Curry S.J., Dorfman S.F., Faith S., Froelicher E.S., Goldstein M.G., Healton C.G., Henderson P.N., Heyman R.B., Koh H.K., Kottke T.E., Lando H.A., Mecklenburg R.E., Mermelstein R.J., Mullen P.D., Orleans T., Robinson L., Stitzer M.L., Tommasello A.C., Villejo L., Wewers M.E. 2008. *Treating Tobacco Use and Dependence: Update*. Clinical Practice Guideline. Department of Health and Human Services. Public Health Service, Rockville. Available online: https://www.ncbi.nlm.nih.gov/books/NBK63952/ (access: 22.03.2021).

Fiore M.C., McCarthy D.E., Jackson T.C., Zehner M.E., Jorenby D.E., Mielke M., Smith S.S., Guiliani T.A., Baker T.B. 2004b. Integrating smoking cessation treatment into primary care: an effectiveness study. *Preventive Medicine* 38(4), pp. 412–420. DOI: 10.1016/j.ypmed.2003.11.002.

Fiore M.C., Novotny T.E., Pierce J.P., Giovino G.A., Hatziandreu E.J., Newcomb P.A., Surawicz T.S., Davis R.M. 1990. Methods used to quit smoking in the United States: Do cessation programs help? *Journal of American Medical Association* 263(20), pp. 2760–2765.

Fiore M.C., Payne R., Manley M.W. 1994. A Missed Opportunity Teaching Medical Students to Help Their Patients Successfully Quit Smoking. *Journal of the American Medical Association* 8, pp. 624–626. DOI: 10.1001/jama.271.8.624.

Fundaçao Prof. Fernando de Pádua 2016. *CINDI Life Countrywide Integrated Noncommunicable Diseases Intervention*. Ancora Editora, Lisbon.

Geller A.C., Hayes R.B., Leone F., Churchill L.C., Leung K., Reed G., Jolicoeur D.G., Okuliar C., Adams M., Murray D.M., Liu Q., Waugh J., David S., Ockene J.K. 2013. Tobacco Dependence Treatment Teaching by Medical School Clerkship Preceptors: Survey Responses from more than 1000 US Medical Students. *Preventive Medicine* 57(2), pp. 81–86. DOI: 10.1016/j.ypmed.2013.04.006.

Geller A.C., Powers C.A. 2007. Teaching smoking cessation in U.S. medical schools: a long way to go. *AMA Journal of Ethics* 1(9), 21-25. DOI: 10.1001/virtualmentor.2007.9.1.medu1-0701.

Geller A.C., Zapka J., Brooks K.R., Dube C., Powers C.A., Rigotti N., O'Donnell J., Ockene J. 2005. Tobacco control competencies for US medical students. *American Journal of Public Health* 95, pp. 950–955. DOI: 10.2105/ajph.2004.057331.

Gerstenkorn A., Suwala M. 1996. *Terapia antynikotynowa w praktyce lekarskiej*, *1st ed*. PTMOIŚ, Lublin.

Glanz S.A., Parmley W.W. 1991. Passive smoking and heart disease: epidemiology, physiology, and biochemistry. *Circulation* 83, pp. 1–12. DOI: 10.1161/01.cir.83.1.1.

GTSS Collaborative Group 2005. Tobacco use and cessation counseling. *Tobacco Control* 2(Suppl. 2), ii31–34. DOI: 10.1136/tc.2006.011.570.

Harlap S, Davies AM. 1974. Infant admissions to hospital and maternal smoking. *Lancet* 303(7857), pp. 529–532. DOI: 10.1016/s0140-6736(74)92714-7.

Hayes R.B., Geller A.C., Crawford S.L., Jolicoeur D.G., Churchill L.C., Okuyemi K.S., David S.P., Adams M. Waugh J., Okuyemi K., Fauver R., Gross R., Leone F., Xiao R., Waugh J., Crawford S., Ockene J.K. 2014. Teaching tobacco dependence treatment and counseling skills during medical school: rationale and design of the Medical Students helping patients Quit tobacco (MSQuit) group randomized controlled trial. *Contemporary Clinical Trials* 37(2), pp. 284–293. DOI: 10.1016/j.cct.2014.01.008.

Hayes R.B., Geller A.C., Crawford S.L., Jolicoeur D.G., Churchill L.C., Okuyemi K.S., David S.P., Adams M., Waugh J., Allen S.S., S., Leone F.T., Fauver R., Leung K., Liu Q., Ockene J.K. 2015. Medical school curriculum characteristics associated with intentions and frequency of tobacco dependence treatment among 3rd year US medical students. *Preventive Medicine* 72, pp. 56–63. DOI: 10.1016/j.ypmed.2014.12.035.

Hopkins D.P., Briss P.A., Ricard C.J., Husten C.G., Carande-Kulis V.G., Fielding J.E., Alao M.O., McKenna J.W., Sharp D.J., Harris J.R., Task Force on Community Preventive Services 2001. Reviews of Evidence Regarding Interventions to Reduce Tobacco Use and Exposure to Environmental Tobacco Smoke. *American Journal of Preventive Medicine* 20(Suppl. 2), pp. 16–66. DOI: 10.1016/s0749-3797(00)00297-x/.

Hovell M.F., Meltzer S.B., Zakarian J.M., Wahlgren D.R., Emerson J.A., Holstetter C.R., Leaderer B.P., Meltzer E.O., Zeiger R.S., O'Connor, et al. 1994. Reduction of environmental tobacco smoke exposure among asthmatic children: a controlled trial. *Chest* 106(2), pp. 440–446. DOI: 10.1378/chest.106.2.440.

Hovell M.F., Zakarian J.M., Matt G.E., Liles S., Jones J.A., Hofstetter C.R., Larson S.N., Benowitz N.L. 2009. Counseling to reduce children's secondhand smoke exposure and help parents quit smoking: a controlled trial. *Nicotine and Tobacco Research* 11(12), pp. 1383–1394. DOI: 10.1093/ntr/ntp148.

International Agency for Research and Cancer IARC. World Health Organization. World Cancer Report 2020. Available online: https://www.iarc.who.int/cards_page/world-cancer-report/ (access: 7.04.2021).

Jacob P., Benowitz N.L., Destaillats H., Gundel L., Hang B., Martins-Green M., Matt G.E., Quintana P.J., Samet J.M., Schick S.F., et al. 2017. Third hand smoke: new Evidence, challenges, and future directions. *Chemical Research in Toxicology* 30, pp. 270–294. DOI: 10.1021/acs.chemrestox.6b00343.

Jarvis M.J., Feyerabend C. 2015. Recent trends in children's exposure to second-hand smoke in England: cotinine evidence from the Health Survey for England. *Addiction* 110(9), pp. 1484–1492. DOI: 10.1111/add.12962.

Jassem J., Przewoźniak K., Zatoński W. 2014. Tobacco control in Poland – successes and challenges. *Translational Lung Cancer Research* 3(5), pp. 280–285. DOI: 10.3978/j.issn.2218-6751.2014.09.12.

Lancaster T., Stead L.F. 2017. Individual behavioral counselling for smoking cessation. *Cochrane Database Systematic Review* 3(3), CD001292. DOI: 10.1002/14651858.CD001292.pub3.

Learning from the Experts: A Course for Healthcare Professionals by the Institute for Global Tobacco Control at the Johns Hopkins Bloomberg School of Public Health. Available online: https://hp.globaltobaccocontrol.org/online_training (access: 7.03.2021).

Mazor K.M., Jolicoeur D., Hayes R.B., Geller A.C., Churchill L., Ockene J.K. 2015. Assessing medical students' tobacco dependence treatment skills using a detailed behavioral checklist. *Teaching and Learning in Medicine* 27(3), pp. 292–298. DOI: 10.1080/10401334.2015.1044660.

Moore G.F., Currie D., Gilmore G., Holliday J.C., Moore L. 2012. Socioeconomic inequalities in childhood exposure to secondhand smoke before and after smoke-free legislation in three UK countries. *Journal of Public Health* 34, pp. 599–608. DOI: 10.1093/pubmed/fds025.

Ockene J.K., Hayes R.B., Churchill L.C., Crawford S.L., Jolicoeur D.G., Murray D.M., Shoben A.B., David S.P., Ferguson K.J., Huggett K.N., Adams M., Okuliar C.A., Gross R.L., Bass P.F., Greenberg R B., Leone F.T., Okuyemi K.S., Rudy D.W., Waugh J.B., Geller A. C.2015. Teaching Medical Students to Help Patients Quit Smoking: Outcomes of a 10-School Randomized Controlled Trial. *Journal of General Internal Medicine* 31(2), pp. 172–181. DOI: 10.1007/s11606-015-3508-y.

Office of Health and Environmental Assessment 1992. *Respiratory health effects of passive smoking: Lung cancer and other disorders*. Washington. Available online: https://www.epa.gov/sites/production/files/2014-09/documents/passive_smoke.pdf (access: 9.03.2021).

Pederson L.L., Blumenthal D.S., Dever A., Mc Crady G. 2006. A web-based smoking cessation and prevention curriculum for medical students: why, how, what, and what next. *Drug and Alcohol Review* 25, pp. 39–47. DOI: 10.1080/09595230500459503.

Powers C.A., Zapka J.G., Bognar B., Dube C., Hyder Ferry L., Ferguson K.J., O'Donnell J.F., Rigotti N., Conley Thomson C., White M., Wilkerson L., Geller A.C., McIntosh S. 2004. Evaluation of current tobacco curriculum at 12 US medical schools. *Journal of Cancer Education* 19, pp. 212–219. DOI: 10.1207/s15430154jce1904_7.

Pugmire J., Sweeting H., Moore L. 2017. Environmental tobacco smoke exposure among infants, children and young people: now is no time to relax. *Archives of Disease in Childhood* 102(2), pp. 117–118. DOI: 10.1136/archdischild-2016-311652.

Richmond R. 2009a. Education and training for health professionals and students in tobacco, alcohol and other drugs. Editorial. *Drug and Alcohol Review* 28(5), pp. 463–465. DOI: 10.1111/j.1465-3362.2009.00115.x.

Richmond R., Zwar N., Taylor R., Hunnisett J., Hyslop F. 2009b. Teaching about tobacco in medical schools: A worldwide study. *Drug and Alcohol Review* 28(5), pp. 484–497. DOI: 10.1111/j.1465-3362.2009.00105.x.

Richmond R.L. 1999. Teaching medical students about tobacco. *Thorax* 54(1), pp. 70–78. DOI: 10.1136/thx.54.1.70.

Richmond R.L. 2004. The process of introducing a tobacco curriculum in medical school. *Respirology* 9(2), pp. 165–172. DOI: 10.1111/j.1440-1843.2004.00578.x.

Richmond R.L., Debono D.S., Larcos D., Kehoe L. 1998. Worldwide survey of education on tobacco in medical schools. *Tobacco Control* 7(3), pp. 247–252. DOI: 10.1136/tc.7.3.247.

Richmond R.L., Taylor R. 2006. Global dissemination of a tobacco curriculum in medical schools. *International Journal of Tuberculosis and Lung Disease* 10(7), pp. 750–755.

Stead L.F., Buitrago D., Preciado N., Sanchez G., Hartmann-Boyce J., Lancaster T. 2013. Physician advice for smoking cessation. *Cochrane Database of Systematic Review* 5. DOI: 10.1002/14651858.CD000165.pub4.

Tessier J.F., Freour P.P., Belougne D., Crofton J. 1992a. Smoking habits and attitudes of medical students towards smoking and anti-smoking campaigns in nine Asian countries. *International Journal of Epidemiology* 21, pp. 298–304. DOI: 10.1093/ije/21.2.298.

Tessier J.F., Freour P.P., Crofton J., Kombou L. 1989. Smoking habits and attitudes of medical students towards smoking and anti-smoking campaigns in fourteen European countries. *European Journal of Epidemiology* 5, pp. 311–321. DOI: 10.1007/BF00144831.

Tessier J.F., Freour P.P., Nejjari C., Belougne D., Crofton J.W. 1992b. Smoking behaviour and attitudes of medical students towards smoking and anti-smoking campaigns: a survey in ten African and Middle Eastern countries. *Tobacco Control* 1(2), pp. 95–101. DOI: 10.1136/tc.1.2.95.

Tessier J.F., Freour P.P., Nejjari C., Belougne D., Crofton J.W. 1993. Smoking behaviour and attitudes towards smoking of medical students in Australia, Japan, USA, Russia and Estonia. *Tobacco Control* 2, pp. 24–29. Available online: https://www.jstor.org/stable/20747274 (access: 22.03.2021).

U.S. Department of Health and Human Services 1990. The Surgeon General's 1990 Report on the Health Benefits of Smoking Cessation Executive Summary – Introduction, Overview, and Conclusions. Available online: https://www.cdc.gov/mmwr/preview/mmwrhtml/00001801.htm (access: 9.03.2021).

U.S. Department of Health and Human Services 2006. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. Available online: https://www.ncbi.nlm.nih.gov/books/NBK44324/ (access: 22.03.2021).

World Health Organization 1999. *International Consultation on Environmental Tobacco Smoke (ETS) and Child Health, 11–14 January 1999. Geneva, Switzerland.* Available online: https://apps.who.int/iris/handle/10665/65930 (access: 3.03.2021).

World Health Organization 2000. *World Directory of Medical Schools*, *7th edition*. Available online: https://apps.who.int/iris/handle/10665/42198 (access: 9.03.2021).

World Health Organization 2004. *Tools for advancing tobacco control in the 21st century. Tobacco control legislation: an introductory guide*. Available online: https://www.who.int/tobacco/research/legislation/Tobacco%20Control%20Legislation.pdf (access: 22.03.2021).

World Health Organization 2013a. *Strengthening health systems for treating tobacco dependence in primary care. Part III: Training for primary care providers*. Available online: http://apps.who.int/iris/bitstream/handle/10665/84388/9789241505413_eng_Part-III_service_providers.pdf;jsessionid=A0020FA8307E5946E43FEA2B09D43027?sequence=4 (access: 5.02.2021).

World Health Organization 2013b. *WHO Framework Convention on Tobacco Control*. Available online: http://www.who.int/fctc/en/ (access: 6.03.2021).

World Health Organization 2014. Toolkit for delivering the 5A's and 5R's brief tobacco interventions in primary care. Available online: https://apps.who.int/iris/bitstream/handle/10665/112835/9789241506953_eng.pdf (access: 22.03.2021).

World Health Organization 2021. *Tobacco*. Available online: https://www.who.int/news-room/fact-sheets/detail/tobacco (access: 7.03.2021).

Xiao R.S., Hayes R.B., Waring M.E., Geller A.C., Churchill L.C., Okuyemi K.S., Adams M., Huggett K.N., Ockene J.K. 2015. Tobacco. Counselling Experience Prior to Starting Medical School, Tobacco Treatment Self-Efficacy and Knowledge among First-Year Medical Students in the United States. *Preventive Med*icine 73, pp. 119–124. DOI: 10.1016/j.ypmed.2015.02.003.

Zwar N., Richmond R., Davidson D., Hasan I. 2009. Postgraduate education for doctors in smoking cessation. *Drug and Alcohol Review* 28(5), pp. 466–73. DOI: 10.1111/j.1465-3362.2009.00103.x.

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