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Medical students' attitudes towards tobacco smoking at the first and sixth year of their studies 2002–2008

Abstract

Introduction: The prevalence of smoking among medical students indicates that studying medicine is an insufficient protection from tobacco use. The aim of the study was an analysis of medical students' attitudes towards smoking at the first and sixth year of their studies.

Material and methods: A questionnaire on tobacco smoking was distributed among medical students of the study year 2002–2008 at the first and sixth year of their studies. The questionnaire used on the sixth year students included additional questions designed to assess changes in their attitudes towards smoking during their studies, to ask their opinion of the teaching of diagnostics and treatment of tobacco dependence (TD), and to discover how they evaluated their knowledge of the issue. The numbers of students who participated at the two points of the study were 287 and 175 respectively.

Results: Students in their sixth year significantly less frequently smoked cigarettes regularly than those starting their medical education (13% *v.* 21%; $p = 0.022$). However, 20% of smokers started smoking during their studies. The proportion of smokers saying they were not embarrassed by their smoking habit was significantly lower among sixth-year students compared to first-year students (31% *v.* 70%; $p = 0.0006$), as were the numbers who said they wanted to quit smoking (91% *v.* 61%). Those who wished to undergo treatment for TD (54% *v.* 22%) were significantly higher among sixth year students group ($p = 0.013$ and $p = 0.001$, respectively). More than half (57%) the sixth-year students claimed that they had no knowledge of the diagnostics and treatment of TD, or that their knowledge on this issue was poor or very poor. In the opinion of 43% of students, the medical curriculum was not a good source of knowledge on TD.

Conclusions: Medical studies induce positively students' attitudes towards smoking. However, a proportion of individuals start smoking during studies, which may suggest dominance of genetic influences on smoking initiation in this period of life. In sixth-year students' opinion, medical studies are not a sufficient source of knowledge on TD.

Key words: tobacco smoking, medical students, attitudes towards smoking, tobacco dependence

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Introduction

According to the latest WHO data, tobacco smoking in Poland is still widespread: 38% of men and 26% of women are smokers [1]. Unfortunately, this habit is also common among medical students, despite a perception in society expecting future medical workers to maintain a healthy lifestyle. The data obtained from students of the Medical University of Gdansk six years earlier showed

that 21% of them were daily smokers, including 28% of men and 17% of women [2]. The recently published review of foreign data concerning tobacco smoking among students at medical universities indicates that Polish students smoke significantly less than their counterparts in Greece, Spain, Turkey or Slovakia, where the incidence of smoking exceeded 30%, but much more than in the United States, Australia, Norway, China, India, Thailand or Malaysia [3]. This review also

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showed that in almost all studies, tobacco smoking increased during the years of education [3]. For example, in India there were 7% of smokers at the first year and more than twice as many at the fourth year of studies [4]. Similarly, the study conducted in Albania, where tobacco smoking among medical students, especially men, is very popular, showed that in the first year 34% of men and 5% of women initiated smoking, whereas in the sixth year 55% of men and 34% of women were smokers [5]. A very few studies do not indicate a linear increase in the number of smokers among older students. For example, in one of the American universities, the rate of smokers decreased from 3.3% at the first year to 2.5% at the second year but then increased to 3.8% at the third and fourth year [6].

Our study was a continuation of a previous study on the prevalence of tobacco smoking among first-year medical students who started their medical training in 2002 and 2003 [2]. Its aim was to assess attitudes towards smoking among first and sixth year students from the years 2002–2008.

Material and methods

In 2002, 287 students started their medical training at the Medical University of Gdansk. During one of the lectures, all of the students present (247 people, 86% of all first-year students) were asked to fill out a questionnaire concerning different issues around tobacco smoking. After six years, the students from the years 2002–2008 were given a questionnaire again. 175 people were present during the lecture (70% of all sixth-year students), (114 women and 61 men) answered the questions. Ages ranged from 23 to 30 years (mean 24.4 years). The students marked if they had been questioned in the previous study, or if it was their first time. More than half of respondents (51%) said they had answered a similar questionnaire before, at their first year of medical studies. The other 49% did not give such information, or claimed not to recall taking part in previous studies.

Among sixth-year students, a questionnaire similar to the one used at the first-year, with only small modifications, was distributed [2]. The questions included socio-demographic data (age, sex, origin whether urban or rural, mother's and father's education status), tobacco smoking among parents, students' attitudes towards tobacco smoking (to fully estimate the number of smokers during the sixth year of their training, occasional smokers were also included), possible addiction to tobacco (number of cigarettes per day, time from

wake-up until the first cigarette). In this study, we used the definition of attitudes towards tobacco smoking according to the WHO criteria [7].

Other questions in the questionnaire concerned factors enhancing smoking, situations that increased the need to smoke a cigarette, and factors influencing the choice of tobacco brand, including advertisements. Some questions asked about attitudes towards quitting, awareness of tobacco's negative effect on health and respondents' opinion of tobacco dependence treatment, especially including possible personal experiences in nicotine replacement therapy as a treatment to quit.

To assess the possible changes in students' smoking attitude towards smoking, there were a few extra questions in this questionnaire, concerning a change in smoking status and factors influencing commencing or quitting the habit during the medical studies. Other questions added to the questionnaire assessed the respondents' opinion on teaching about the diagnosis and treatment of tobacco dependence and self-evaluation of the knowledge on these issues. On the other hand, some questions were deleted from the second study, for example questions concerning the age of smoking initiation and the influence of other people on starting the habit.

For the statistical analysis the calculation used Statistica (StatSoft Inc, USA) version 8.0 software; the U Mann Whitney test was used to compare the two independent groups and the Chi-square test was used to compare the proportions. The p value was established as $p < 0.05$.

Results

Among the sixth year students, there were 23 (13%) daily smokers and 12 (6.9%) occasional smokers. 16 (9.1%) students had been smokers in the past. The rate of smokers was significantly higher among men than among women ($p = 0.0005$) (Table 1).

At the end of medical studies, the students from academic years 2002–2008 regularly smoked cigarettes less often than during their first year (13% v. 21%, $p = 0.22$), though this was statistically relevant only in women (8.8% v. 18%; $p = 0.039$). In men, the number of smokers decreased from 29% to 21% ($p = 0.27$).

While at the beginning of medical studies almost one in every four students coming from the countryside was smoking (23%), at the end of the studies in this group there were no daily smokers. A high rate of smokers was noticed in students originating from the cities. The highest rate of cur-

Table 1. Distribution of smoking status among sixth year medical students according to selected characteristics

Characteristic	Smoking status									
	Total		Daily smokers		Occasional smokers		Ex-smokers		Never smokers	
	No.	%	No.	%	No.	%	No.	%	No.	%
Sex										
Females	114	65.0	10	8.8	4	3.5	8	7.0	92	80.7
Males	61	35.0	13	21.3	8	13.1	8	13.1	32	52.5
Area of residence										
Village	8	4.6	0	0	0	0	2	25.0	6	75.0
Town < 50 000 inhabitants	57	32.6	4	7.0	7	12.3	4	7.0	42	73.7
Town 50–200 000 inhabitants	44	25.1	8	18.2	2	4.5	7	15.9	27	61.4
Town > 200 000 inhabitants	66	37.7	11	16.7	3	4.5	3	4.5	49	74.2
Mother's level of education										
Elementary	2	1.1	0	0	0	0	1	50.0	1	50.0
Secondary not completed	7	4.0	0	0	0	0	0	0	7	100
Secondary	46	26.3	3	6.5	4	8.7	3	6.5	36	78.3
University not completed	18	10.3	0	0	1	5.6	3	16.7	14	77.7
University	102	58.3	20	19.6	7	6.9	9	8.8	66	64.7
Father's level of education										
Elementary	4	2.3	0	0	0	0	1	25.0	3	75.0
Secondary not completed	13	7.4	2	15.4	0	0	0	0	11	84.6
Secondary	42	24.0	3	7.1	3	7.1	2	4.8	34	81.0
University not completed	13	7.4	1	7.7	0	0	0	0	12	92.3
University	103	58.9	17	16.5	9	8.8	13	12.6	64	62.1

rent smokers was among students from big cities (Table 1).

In students who were about to end their medical studies, there was no correlation between smoking and their mother's or father's education.

Among daily smokers, 13 students smoked more than 10 cigarettes a day (57%). Of these, five (22%) had their first cigarette during the 30 minutes after waking up.

The factors influencing the need to smoke tobacco were quite similar to those witnessed during the first year studies. Most commonly, it was a desire to feel the pleasure which accompanied smoking (63% *v.* 69%; $p = 0.58$), a habit (37% *v.* 19%; $p = 0.051$), a wish to decrease anxiety (26% *v.* 28%; $p = 0.83$), excess time/boredom (8.5% *v.* 13%, $p = 0.52$).

At the end of the studies, just like at the beginning, students admitted to smoking more while in stressful situations (86% *v.* 72%; $p = 0.14$).

Most smoking sixth-year students (57%) denied the influence of advertising on their choice of brand. Every tenth smoker though felt he definitely underwent the influence of advertising, and 22% said they probably chose their cigarette brand

under the influence of advertisements. Similarly to the first year, the choice of cigarette brand was usually caused by their taste (55% *v.* 57%) and being used to a given brand (34% *v.* 37%).

While during the first year of studies 70% of smokers smoked tobacco without being embarrassed, during the sixth year a similar rate of smokers perceived smoking to be very embarrassing (8.6%) or sometimes embarrassing (60%). Therefore, the rate of students smoking without being embarrassed was significantly lower during the last year of medical studies compared to the first year (70% *v.* 31%; $p = 0.0006$). Still about a half of smokers (49%) smoked both with other people and alone, 37% smoked mainly with other people and 14% solely alone.

Compared to the beginning of the studies, among the last-year students, the proportion of students declaring a wish to quit the habit was significantly higher (91% *v.* 61%; $p = 0.013$). All the last-year smokers were aware of the negative impact of smoking on their health. The rate of smokers who wished to undergo tobacco dependency treatment was significantly higher among the sixth-year students too (54% *v.* 22%; $p =$

Table 2. Changes in smoking behaviors among current smokers during medical studies

No. of persons/Type of change	No. of smokers	% of smokers
Total number	35	100
Smoking initiation*	7 (4)	20.0 (11.4)
Increase in the number of cigarettes smoked daily	2	5.7
Occasional smoking replaced by daily smoking	4	11.4
Decrease in the number of cigarettes smoked daily	3	8.6
Daily smoking replaced by occasional smoking	3	8.6
No change*	16 (5)	45.7

*Numbers in brackets refer to occasional smoking

0.013). On the other hand, the rate of students who did not believe in the success of nicotine replacement therapy was also slightly higher in this group compared to first-year students (69% *v.* 61%; $p = 0.48$).

In the given group of students, thirteen (7.4%), including eight daily smokers, quit smoking during the studies. The factors influencing the abandonment of smoking were: the inner need to quit the habit (7 cases), better awareness of tobacco smoking impact on health gained during the medical studies (4 cases), social factors like lack of acceptance from society, pregnancy (4 cases) and caring for one's own health (3 cases).

Every sixth smoking student of the sixth year (20%) started smoking during their studies and 17% of smokers increased the frequency or number of cigarettes a day in comparison to the first year. On the other hand, 17% of smokers reduced the number of cigarettes a day during their studies. Changes in the habits of tobacco smoking during the studies in current smokers are presented in Table 2.

Factors influencing the start of smoking during the medical studies mentioned by the respondents were: anxiety (2 cases), student parties (2 cases), other students smoking (1 person) and drinking alcohol (1 person).

Respondents' opinions of teaching the diagnosis and treatment of the tobacco dependency syndrome during the medical studies and self-evaluation on the knowledge of these issues is presented in Table 3.

More than half of the students suggested they had no knowledge at all (5.7%) of diagnosis and treatment of tobacco dependency, or their knowledge was very weak or weak (51%). 43% of respondents said that medical studies were not the source of knowledge on tobacco dependency at all. Almost all students (93%) suggested that this issue should be a part of the syllabus.

Discussion

The present study showed that the prevalence of smokers among sixth year medical students who have studied in years 2002–2008 was significantly lower than at the beginning of their medical training. Numerous prospective studies held on medical students, including Australia [8], India [9] and Ireland [10] confirm this tendency. However, in one such a study held in Turkey, the rate of smokers during medical studies increased from 22% to 27%, moreover 32% of non-smokers during the first year started to smoke by the end of their studies [11]. Similarly, in Slovakia, every third smoking sixth-year student started to smoke during the studies [12]. It is noticeable that knowledge of the negative impact of tobacco smoking on health does not seem to be a barrier to continue, or even start, smoking by medical students [13, 14]. On the other hand, the studies on Polish medical students showed that the prevalence of smoking was steadily decreasing [15–17].

In our material, despite lower rate of smokers by the end of the studies in comparison to the first year, 20% of sixth-year smokers started smoking during their medical training. Quite late age of tobacco initiation, despite knowledge of tobacco's harmfulness to health, suggests that other factors, some of them genetic, may influence on this phenomenon. In studies of twins it was found that the genetic factors influencing the initiation of smoking increased with age and its influence was the strongest after maturity, at the age of 19–25 [18, 19]. It is also known that starting smoking is influenced by the interaction of genotype and the environment [20]. The genetically determined set of personality features may create a person susceptible to the influence from the environment and prone to dependencies [21]. Some authors suggest that the personality features and tobacco smoking

Table 3. Opinions of sixth year medical students on teaching of tobacco dependence diagnostics and treatment, and self-esteem of their knowledge on this issue

Question	No. of persons	% of smokers
How would you rate your knowledge on the diagnostics and treatment of tobacco dependence?		
I have no knowledge on the theme	10	5.7
Very poor	22	12.6
Poor	66	37.7
Good	66	37.7
Very good	9	5.2
Missing data	2	1.1
Were medical studies a source of your knowledge on tobacco dependence diagnostics and treatment?		
Yes	24	13.8
Partially	73	41.7
No	76	43.4
Missing data	2	1.1
Should teaching about diagnostics and treatment of tobacco dependence be included in the curriculum for medical students?		
Yes	162	92.6
No	2	1.1
I have no opinion on the subject	6	3.4
Missing data	5	2.9

may depend on the same genetic background, though this correlation still is not very clear [22]. For now, it is known that people with low self-esteem, those who are depressive and with high level of anxiety smoke cigarettes more often [22–24]. In the aforementioned study of Turkish medical students, it was found that the risk of tobacco initiation during the studies was higher in students with higher anxiety levels, and most new smokers started smoking during the first year of the studies [11], which was probably associated with the stressful moments of commencing the education, adaptation to a new environment and university life [25, 26]. In presented studies, anxiety was one of the most commonly mentioned reasons for smoking, both in the first and sixth-year students (26% and 30% of students respectively). What is more, most smokers increased the number of cigarettes smoked in stressful situations.

In another Turkish study, the link between the presence and intensity of depression with smoking was assessed among medical students [27, 28]. In one of them, among military medical students, mostly males, Gulec et al. found a 2.2 times higher risk of depression in smokers than in non-smokers [28]. There was also a correlation between the intensity of depression according to

the Beck's scale [29] and the number of cigarettes per day. Akvardar et al. [27] found significantly higher depression intensity among first and last-year medical students compared to students of other years. Probably the reason of it was greater pressure of exams, higher anxiety levels and concern of the last-year students about their future career. In presented studies, the correlation between anxiety level or depression and smoking was not surveyed, though it was possible that the personality features, mainly genetically determined, could have had a considerable impact on continuing or even commencing smoking during the studies. Probably cigarette smoking by the last-year students is determined by various factors, including genetic, individualistic and environmental.

The impact of environment of tobacco smoking can be seen in the variable prevalence of this habit among students depending on the faculty. In the study by Malary et al. held at the Silesian universities (Medical University, Technical University and Physical Education University) medical students were in the middle concerning tobacco smoking (10.2%), in comparison to physical education students (17.5%) and technical faculties students (8%) [30]. There were also some interesting conclusions of the studies held in the

end of the 20th century in eight universities in Gdańsk [17]. The worst lifestyle concerning the use of stimulants was noticed in students of the Academy of Arts (50% of smoking women and 41.7% of smoking men) and in students of Higher School of Administration and Business (38.8% of smoking women and 37.1% of smoking men). The next highest smoking prevalence were in Higher Maritime School, University of Gdansk, whereas the Medical University of Gdansk was found between the Technical University and the Academy of Physical Education, as in Malarý's study. No smokers were observed among the students of the Theological Seminary.

In the given studies, the most common reason to smoke, both among first and last-year students, was smoking for pleasure, which had been noticed also in other studies in medical universities [30, 31]. However, it cannot be denied that many students continue the habit more because of the dependency and the wish to avoid the unpleasant symptoms accompanying the lowering of nicotine concentration in blood, rather than for pleasure. A large number of cigarettes smoked and the time of first cigarette after wake-up, were connected with tobacco dependency.

Results of American studies showed that there was a substantial influence of advertisements on choice of tobacco brand [32–36]. For example, intensive advertising of menthol cigarettes and targeted promotion were responsible for their increased use by Afro-Americans and American teenagers [34]. In the study held at the Medical Faculty and the Faculty of Law, Pedagogy and Biology of the University of Poznań, most smokers admitted that advertisements had an influence on their choice of tobacco brand [33]. In our study on the other hand, most students denied the influence of advertisements on their choice of brand. Only every twentieth student of the first year and every tenth student of the sixth year admitted that advertisements had an impact on their choice of brand.

The given analysis of the students' attitudes towards smoking brought another, interesting observation. While at the first year about two thirds of smokers smoked without embarrassment, at the sixth year of medical education the same proportion of smokers felt embarrassed to smoke in front of other people. This clearly shows some psychical discomfort of one's own habit colliding with a healthy lifestyle. There might be some awareness that as future doctors, the students should act as role models in promoting healthy behavior.

At the end of the studies, awareness of tobacco's negative impact on health was declared by all

the smokers. The rate of those willing to quit smoking was up to 91%, while at the first year it was 61%. In comparison to the beginning of the studies the proportion of sixth-year daily smokers who would like to undergo tobacco dependency treatment was also significantly higher. However, a slightly lower proportion of smokers believed, that nicotine replacement therapy to be effective.

It is worth mentioning that the students ending their medical education were characterized by a lack of knowledge of the treatment for tobacco dependency syndrome. Only 43% of them claimed to have sufficient knowledge on this issue. The results of other studies show that there are big differences in teaching medical students how to treat tobacco smokers in different countries. In Slovakian studies, even fewer, about 4%, declared their knowledge on the treatment of tobacco dependency to be sufficient [12]. On the other hand, a Colombian study showed that 58% of fifth-year medical students declared their knowledge on how to help patients quit smoking to be sufficient [37]. The results of our study clearly show that there is a need to introduce, as a priority, teaching about the tobacco dependency syndrome at the medical universities in Poland. Non-smoking doctors with sufficient knowledge and skills on diagnosis and treatment of tobacco dependency are very important in lowering the incidence of smoking in society. Many studies interchangeably showed that a piece of advice given to a patient by a doctor on quitting smoking actually influences quitting the habit [38]. The personal attitude of doctors towards smoking was also very significant, because smoking doctors were more tolerant to this habit in their patients [39].

The analysis of tobacco smoking prevalence among the medical students of the years 2002–2008 had some limitations, which should be taken into account when interpreting the results. One of them related to the method of handing a questionnaire during a single lecture to all the students of the year. This way, students who were not present at the lecture were missed: 14% of students during the first year in 2002 and 30% of the students at the end of the studies. This means that actual prevalence of smoking might have been different from that presented, if there was a higher rate of smoking among the missing students. Another limitation was not using the anonymous coding system, which would allow checking if it actually was the same students taking part in the first and second study. The respondents of the sixth-year could only mark in the questionnaire if they took part in this questionnaire during the first

year; only 51% said they had taken part before. Other students did not recall taking part, or actually did not take part. Therefore, not being sure if it was the same group of students, this population could not be subject to prospective analysis. On the other hand, in the sixth-year questionnaire there was a question on changes in attitude towards smoking. Therefore, despite the above limitations, apart from comparing the prevalence of smoking and the attitudes towards smoking in both groups of students, it did also allow the assessment of changes during the six years.

Conclusions

1. Medical studies have a positive impact on changing students' attitudes towards tobacco smoking. During medical training, the prevalence of smoking decreases among students, and at the end of studies smoking students significantly more often declare the wish to quit smoking compared to those at the beginning of their studies.
2. Some students start smoking during medical studies, which suggests a predominance of genetic factors over environmental ones in this period of life.
3. Medical studies are not considered a sufficient source of information on diagnosis and treatment on tobacco dependency.

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