

ESTIMATION AND ANALYSIS OF SMOKING, THE HARMFUL HABIT OF MEDICAL STUDENTS

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In modern society, smoking is one of the most common harmful habits. The issue of smoking among medical students and the ways to address it are particularly relevant. The study was aimed to identify the priority factors contributing to smoking as the main harmful habit. We performed a cross-sectional study of 254 students using the tailored questionnaire, D. Horn test, and Fagerstrom test. The data obtained were processed and analyzed using the mathematical statistics methods. The findings have shown that 68.4% of students are smokers. The majority of students report negative health effects of smoking: 45% of students complain of cough, 38% complain of mucus, 52% complain of the decrease in physical endurance. Furthermore, low motivation for smoking cessation has been revealed in the majority of respondents. Vaping turned out to be the smoking type most popular among students, and the majority of respondents believe that it is harmless. The identified predominant types of smoking behavior ("support", "craving") suggest emotional stress. The correlation between the students' anxious emotional state and the frequency of smoking has been found ($r = 0.79$). Learning problems and emotional stress are the priority factors contributing to smoking as the main harmful habit of students. Thus, the issue of smoking should be considered both in medical-biological and socio-psychological aspects. It is important to shape health-saving behavior in students through hygienic training and education.

Keywords: smoking, health, students, electronic cigarettes, healthy lifestyle, prevention

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Compliance with ethical standards: the study was compliant with the principles of biomedical ethics. The written informed consent was obtained from all study participants.

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ОЦЕНКА И АНАЛИЗ КУРЕНИЯ — ВРЕДНОЙ ПРИВЫЧКИ СТУДЕНТОВ МЕДИЦИНСКОГО ВУЗА

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В современном обществе курение является одной из наиболее распространенных вредных привычек. Особенно актуальны проблема курения среди студентов медицинского вуза и пути ее решения. Целью исследования было выявить приоритетные факторы, способствующие формированию курения как основной вредной привычки. Проведено одномоментное исследование 254 учащихся с применением специально разработанной анкеты, анкеты Д. Хорна и теста Фагерстрема. Полученный материал обработали и проанализировали, применив методы математической статистики. Результаты исследования показали, что курят 68,4% учащихся. Большинство студентов отмечают отрицательное влияние курения на здоровье: 45% студентов жалуются на кашель, 38% — на мокроту, 52% — на ухудшение физической выносливости. При этом у большинства респондентов выявлен низкий уровень мотивации к отказу от курения. Самым популярным среди студентов видом курения оказался вейпинг, при этом большинство опрошенных считают его безвредным. Выявленные преобладающие типы курительного поведения («поддержка», «жажда») свидетельствуют об эмоциональном напряжении. Обнаружена корреляционная связь между тревожным эмоциональным состоянием учащихся и частотой курения сигарет ($r = 0,79$). Приоритетными факторами, способствующими формированию курения как основной вредной привычки студентов, являются проблемы с учебной и эмоциональное напряжение. Таким образом, рассматривать проблему курения необходимо как в медико-биологическом, так и в социально-психологическом аспекте. Важно формировать у студентов здоровьесберегающее поведение посредством гигиенического обучения и воспитания.

Ключевые слова: курение, здоровье, студенты, электронные сигареты, здоровый образ жизни, профилактика

Вклад авторов: все авторы сделали эквивалентный вклад в подготовку публикации.

Соблюдение этических стандартов: проведенное исследование соответствовало требованиям биомедицинской этики. Письменное добровольное информированное согласие было получено от каждого участника исследования.

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Speaking of healthy lifestyle as a societal norm, Vladimir Putin, the President of the Russian Federation, emphasized that health should be the center of the healthcare system. At the same time, insufficient knowledge about the healthy lifestyle can lead to the spread of harmful habits, causing irreparable harm to health. Smoking remains a harmful habit that is most prevalent among students. Sociologists note that almost every second young adult in Russia smokes. The age of nicotine use initiation is 14.2 years in males and 14.6 years in females [1]. About 68% of adolescents have tried smoking at least once. There is a steady upward trend of the number of smoking students from the first year to the last one. Males twice more often become smokers, than females [1–6].

Not only the number of smokers, but also the rate of smoking-related diseases grows every year. The highly toxic, carcinogenic tobacco smoke increases the risk of the diseases affecting all organs and systems of the human body, determining the extraordinary damage of using tobacco products [7–10].

The use of e-cigarettes, vapes becomes more and more popular among the youth, which raises concerns of various healthcare system structures and the public due to potential harmful health effects. Many young adults believe that vaping is less harmful than conventional cigarette smoking, as well as more fashionable and socially acceptable. However, e-cigarettes have a more prominent negative effect on the health status than

conventional cigarettes. The sequelae of using e-cigarettes, vapes are still poorly understood. However, we know that a couple of cigarettes contains more than 30 harmful substances, including diacetyl causing the deadly “popcorn lung”. More than 70% flavorings for vapes contain diacetyl. Bronchiolitis obliterans resulting in the scar formation and narrowing of bronchioli is developed after inhaling this substance with fruity smell. The other toxic substance contained in the vaping fluid, propylene glycol, has cumulative properties. It causes allergy, impairs the kidney and liver function. When heated, propylene glycol and glycerin yield acrolein and formaldehyde having irritant, allergenic, mutagenic and carcinogenic properties. The vape flavorings also cause allergic diseases of the upper respiratory tract and bronchial asthma.

The researchers have not yet managed to substantiate the harm of vaping to human health. Some authors argue that vaping has a harmful effect on the body [11], the other, in contrast, report weaker effects on the body compared to tobacco smoking [12, 13]. The lack of rationale for harmful effects of vaping can result in psychological vape addiction that is developed extremely fast by the youth.

The prevalence of smoking among students, popularity of using e-cigarettes, vapes, and hookahs, especially among future doctors, constitute a serious medical and social problem. Young adults fail to consider the consequences of smoking, which, in turn, dictates the need for hygienic training and education, promotion of health-saving behavior [14–17].

Education of the negative attitude to smoking, shaping healthy lifestyle in students are priority components of the system of education in the medical university and an important direction of professional training of physicians, whose responsibilities include preventive work with the population, particularly prevention of deviant behavior among young adults [18–23].

Smoking is a harmful habit, which can and should be influenced as early as possible, in young adulthood, since smoking cessation can reduce the risk of a number of serious medical conditions.

The study was aimed to identify the priority factors contributing to smoking as the main harmful habit of students.

METHODS

The cross-sectional study performed in the fall semester (November 2023) involved students of the Burdenko Voronezh State Medical University. A total of 254 people were enrolled (151 females and 103 males). We performed anonymous polling of the 2nd-year medical students, whose average age was 19.1 ± 0.3 years. The tailored questionnaire contained questions regarding motivation for smoking, frequency of using cigarettes, knowledge about harmful effects of smoking. The D. Horn test was used to determine the type of the students' smoking behavior (“stimulus”, “fiddle”, “relaxation”, “support”, “craving” or “reflex”). The Fagerstrom test was used to estimate the nicotine addiction degree.

To determine prioritisation and gender-related differences in smoking, the group of students was divided into two samples (males and females). The required sample size had not been previously defined.

The data acquired were processed and analyzed using the mathematical statistics methods. Statistical analysis of the results was performed using the MyOffice 2022 software package (New Cloud Technologies; Russia). Comparison of sample means was performed using the Student's *t*-test for independent samples with subsequent determination

of statistical significance (*p*-value). The correlation was considered to be significant at $p \leq 0.05$. The correlation between the respondents' psychophysiological indicators and the prevalence of smoking was determined using the Pearson correlation coefficient (*r*).

RESULTS

The results of anonymous polling have shown that 68.4% of surveyed students smoke, among them 78.4% smoke regularly. Furthermore, at the time of the questionnaire survey, the number of cigarettes consumed by one respondent was 12.3 ± 0.4 cigarettes per day, while a year ago the students consumed on average 10.3 ± 0.4 cigarettes per day, i.e. the smoking intensity increased by their 2nd year.

The age of smoking initiation in students was 13 ± 1.2 years. The students started smoking due to the following reasons: “friends were smokers” — 21%, “to cope with stress/due to learning problems” — 73%, “to look older” — 17%, “out of curiosity” — 12%.

The prevalence of smoking was 71% in male students and 59% in female students.

The analysis of the students' health status subjective assessment has shown that students who smoke more often complain of cough (45.2%), mucus (38.3%), vertigo (33.8%), fatigue (12.3%). The majority of students (87.5%) have noted that in general smoking has a negative impact on their health.

Students believe that the most significant negative health effects of smoking are as follows: the decrease in physical endurance that also manifests itself when participating in sports, dancing (52.5%); slower recovery after exercise and aesthetic defects (yellow teeth and skin) (68.1%). Shortness of breath and chest pain following physical exertion have been reported in 76.5% of students who smoke.

Today, vaping becomes more and more popular among students. The questionnaire survey results have shown that 78.3% of students who smoke use vapes, and only 16.3% note that this smoking type presents a health risk. However, e-cigarettes have a more prominent negative health effect than conventional cigarettes [11]. According to the findings, 83.7% of respondents believe that vapes are less harmful than conventional cigarettes. The main factors contributing to the increase in the prevalence of vaping among students are as follows: possibility of smoking indoors, no tobacco smell, lower consumption of conventional cigarettes, fashion.

Furthermore, hookah smoking has become widespread among students, which can be considered as one of the conditions contributing to shaping harmful habits. According to the study results, about 36% of surveyed students smoke hookah, but the smoking rates of males and females are different. Regular hookah smoking means inhaling significantly more smoke compared to the cigarette smoking. The surveyed students' opinion about the issue is incorrect. They believe that hookah is less dangerous than cigarettes and that it is easy to stop smoking hookah.

The reasons why young adults smoke hookah vary. They mostly smoke for fun (57.1%), to relax (74.3%) or simply out of curiosity (12.5 %) and for company (18.2%).

The survey of students who smoke made it possible to determine their smoking behavior type. The study revealed several types of smoking behavior. The “stimulus” type was found in 19.1% of surveyed students. Smokers with this type had a high degree of psychological addiction to cigarettes. The second type (“fiddle”), when a person smoked very little, for company, in social situations, was found in about 8.7%

of respondents. The “relaxation” type was typical for about 13.8% of surveyed students. About 53.5% demonstrated the “support” type associated with the situations of anxiety, emotional stress, feeling uncomfortable. They smoked to stop the rage, overcome shyness, gather the courage, sort things out. Young adults view smoking as a means for reducing emotional stress. The “craving” type is found in 3.6% of respondents. This smoking type is associated with physical addiction to tobacco. About 1.3% of surveyed students are not aware of the reasons for their smoking and often do not notice the fact of smoking. The sixth type, “reflex”, is typical for these students.

The “support” smoking behavior is typical for more than a half of surveyed males and females. Furthermore, the “fiddle” and “relaxation” behavior is reported in girls, while the “craving” and “stimulus” types are reported in boys.

Determination of the degree of nicotine addiction among students who smoked revealed medium degree of nicotine addiction in 27.2% of respondents; 61.6% had low degree and 11.3% of students had high degree of nicotine addiction. The highest degree of nicotine addiction was reported in males. The students having a high degree of nicotine addiction noted increased irritability, absent-mindedness, general apathy during the long breaks between using cigarettes.

The students' nicotine addiction was significantly correlated to the age of smoking initiation. Furthermore, the younger was the age of smoking initiation, the stronger was the nicotine addiction ($r = 0.63$).

Moreover, we found a correlation between the students' anxious emotional state and the frequency of smoking cigarettes ($r = 0.79$).

The Fagerstrom test results showed low motivation for smoking cessation in 80.4% of students.

DISCUSSION

The findings are consistent with the results reported by other researchers. Thus, a number of researchers highlight smoking among young adults as a risk factor of pulmonary and cardiovascular disorders, attaching great importance to prevention of the spread of smoking across students and to the overall health culture [18, 21]. The other researchers note that it is necessary to carry out information and preventive work, talking about the dangers of smoking, provide support and assistance to those who want to get rid of this habit, as well as to create conditions for a healthy lifestyle and prevention of nicotine addiction in order to reduce harmful effects of smoking on medical students [8, 17, 19].

According to the results of selective social surveys, the prevalence of smoking among schoolchildren is 20–40%. The prevalence of smoking in Russia varies depending on the region [6, 22].

It has been shown that noncompliance with a healthy lifestyle, tobacco smoking contribute to the increase in young adult morbidity and determine the need to search for new ways to address the issue [23].

According to a number of researchers, the factors contributing to involvement in smoking include communication with smokers, low hygienic culture, lack of desire for learning

and poor academic success, personality and psychological traits, insufficient awareness of the effects of smoking, poor financial situation. Women's smoking differs from men's smoking in that it is less intense, has a later onset, and is more influenced by the degree of financial security [2].

Vaping has become extremely popular among young adults. Respondents believe that the main reason is that this type of smoking is harmless. However, e-cigarettes, vaping can have a more harmful effect on the body, which is confirmed by the data provided by the Center for Hygienic Education of the Population of Rospotrebnadzor.

CONCLUSIONS

Smoking is a significant risk factor for the health of student youth. The results of the study show that smoking as a harmful habit is found in 68.4% of students. The majority of students note that in general smoking adversely affects their health, 45% complain of cough, 38% of mucus, 52% report decreased physical endurance. However, low motivation for smoking cessation is reported in 80.4% of respondents.

The most popular type of smoking has been determined, which is vaping (78.4% of students who smoke; the majority of them believe that this smoking type is harmless). High degree of nicotine addiction has been revealed in 11.3% of respondents, and the degree is significantly correlated to the age of smoking initiation ($r = 0.63$).

It has been found that stress and learning problems represent the common causes of smoking initiation (73%). We have revealed a correlation between the students' anxious emotional state and the frequency of smoking cigarettes ($r = 0.79$). The identified predominant types of smoking behavior (“support”, “craving”) indicate the students' emotional stress and maladaptation.

The priority factors contributing to smoking as a harmful habit include learning problems and emotional stress.

Thus, the issue of smoking should be considered both in medical-biological and socio-psychological aspects. Quitting harmful habits and taking care of health should become parts of the young specialist's image, qualitative characteristics of any professional, especially the future physicians. It is necessary to create an education and training system for physicians and students in terms of combating nicotine addiction and other harmful habits, form a proactive approach to the issue.

The amount of work on medical prevention, hygienic education, training and formation of a healthy lifestyle among young adults in educational organizations needs to be increased. The hygienic training of students should be organized considering the existing risk factors.

Conducting debates, competitions, seminars, festivals, clubs, scientific and educational student events of various formats, discussion and dialogue, support and mutual understanding represent the important aspects of shaping a professional worldview of the physician, who will take care about his/her own health and the health of patients. It is necessary to introduce specialized health-preserving and health-shaping courses at all levels of professional medical education.

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