

Physical activity among first-year medical students, the incidence of coronary arteriosclerosis risk factors among them and their knowledge of the same

Aktywność fizyczna studentów pierwszego roku medycyny z uwzględnieniem występowania czynników ryzyka chorób układu krążenia i ich wiedza w tym zakresie

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Wprowadzenie. Aktywność fizyczna sprzyja utrzymaniu zdrowia i zapobiega występowaniu i progresji chorób cywilizacyjnych oraz stanowi istotną część ich leczenia. Badania naukowe wskazują, że poziom aktywności fizycznej lekarzy odgrywa znaczącą rolę w propagowaniu aktywnego stylu życia wśród ich pacjentów, dlatego też studenci zawodów medycznych powinni posiadać szeroką wiedzę na ten temat. Współpraca lekarzy, fizjoterapeutów i innych zawodów opieki zdrowotnej może przyczynić się do podnoszenia poziomu aktywności fizycznej wśród chorych.

Cel. Ocena aktywności fizycznej studentów pierwszego roku medycyny z uwzględnieniem ich wiedzy w zakresie klasycznych czynników ryzyka chorób układu krążenia i ich występowania.

Materiały i metody. Zbadano 500 studentów pierwszego roku medycyny Śląskiego Uniwersytetu Medycznego w Katowicach. Wśród nich było 306 kobiet i 194 mężczyzn w wieku 18-26 lat. Do oceny aktywności fizycznej wykorzystano Międzynarodowy Kwestionariusz Aktywności Fizycznej. Ponadto w badanej grupie dokonano oceny częstości występowania klasycznych czynników ryzyka chorób układu krążenia i ich wiedzy w tym zakresie.

Wyniki. Wśród ankietowanych 24,0% studentów wykazało wysoki poziom aktywności fizycznej, 60,2% umiarkowany i 15,8% niski poziom aktywności fizycznej. Najczęściej występującymi klasycznymi czynnikami ryzyka chorób układu krążenia były: przewlekły stres (53,0%), niski poziom aktywności fizycznej (41,0%) i palenie tytoniu (10,4%).

Wnioski. Poziom aktywności fizycznej badanych studentów pierwszego roku medycyny był wystarczający, natomiast ich wiedza w tym zakresie – niezadowolająca. Pomimo młodego wieku studenci obciążeni byli czynnikami ryzyka chorób układu krążenia, zwłaszcza siedzącym trybem życia, przewlekłym stresem i paleniem tytoniu.

Słowa kluczowe: aktywność fizyczna, choroby układu krążenia, prewencja pierwotna, czynniki ryzyka, studenci medycyny

Introduction. Physical activity is conducive to maintaining good health, prevents the occurrence and progression of various civilization diseases and constitutes an essential part of their treatment. Scientific research shows that the level of physical activity among physicians plays a significant role in promoting an active lifestyle among their patients, which is why medical students should have extensive knowledge on the subject. Cooperation between doctors, physiotherapists and other health care professionals may contribute to increasing the level of physical activity among patients.

Aim. The study's aim was to assess the level of physical activity of first-year medical students, and also their knowledge of classical risk factors for cardiovascular diseases and their incidence.

Materials & methods. The study examined 500 first-year students at the Medical University of Silesia in Katowice. The group was made up of 306 women and 194 men aged 18-26. The International Physical Activity Questionnaire was used to assess their physical activity. In addition, the study group was assessed in terms of the incidence of classic cardiovascular disease risk factors and their knowledge on this subject.

Results. Among the respondents, 24.0% of students demonstrated a high level of physical activity, 60.2% moderate and 15.8% only a low level. The most common classic cardiovascular risk factors were: chronic stress (53.0%), a low level of physical activity (41.0%) and smoking (10.4%).

Conclusions. The level of physical activity among first-year medical students was sufficient, whereas their knowledge on the subject was unsatisfactory. Despite their young age, these students were burdened with risk factors for cardiovascular disease, especially a sedentary lifestyle, chronic stress and smoking.

Key words: physical activity, cardiovascular diseases, primary prevention, risk factors, medical students

Introduction

Physical activity involves human behaviour and the motor abilities of the organism that enable movement in space, and is understood not only as physical exercise, sports and recreation but also every form of physical activity in daily life.

The body's normal development and the course of physiological and metabolic processes are conditioned to require an optimum or at least minimum amount of movement. Physical activity involves locomotion and basic human needs, and is made possible by the proper co-functioning of the osteoarticular, musculoskeletal and nervous systems.

The efficiency of circulatory and respiratory systems increases as a result of adaptation changes due to physical activity. In addition regular exercise reduces arterial blood pressure, increases stroke volume and cardiac output. Increased blood flow through the tissues leads to improved delivery of oxygen and nutrients. Physical exercise may help develop collateral circulation allowing enough blood supply to organs and the prevention of ischemia.

The effect of moderately intensive physical effort on the nervous system is to increase capabilities and slow the progress of neurodegenerative diseases. An increased secretion of endorphins and serotonin after exercise is conducive to maintaining psychological balance. Regular physical activity also affects the metabolism of carbohydrates and the burning of fat, which contributes to maintaining proper body weight and prevents exacerbation of insulin resistance as well as development of type 2 diabetes. An active lifestyle slows the body's aging process and effects 'positive aging'. Spending leisure time actively reduces the risk of many diseases, including coronary artery disease, reducing symptoms or even preventing premature mortality [1-6]. The American Heart Association (AHA) has established the main objectives to be achieved in order to improve the health behaviour of people with cardiovascular disease, pointing out that the most effective factor for the prevention and treatment of cardiovascular diseases is physical activity, with activation of the muscle groups involved in mechanical, static, dynamic, metabolic, aerobic and anaerobic work [7]. Regular moderate physical activity involving large muscle groups triggers adaptive processes in the cardiovascular system, helping to maintain good physical, social and mental health. Despite the many benefits of physical activity, the global data regarding levels of physical activity is a cause for concern [8]. It should be emphasized that worldwide, lack of physical activity is the fourth largest cause of death [9].

The activity recommended for patients with cardiovascular diseases should be performed for at least 150 minutes a week (at average intensity) or 75 min-

utes (at high intensity). Cardiovascular disease is the most common cause of death and disability, outpacing those due to malignancies [10, 11]. According to the epidemiological data, 29.6% of all deaths in the world are caused by cardiovascular conditions. 4 million people a year die as a result of them [12]. In Poland, the mortality rate for patients suffering from cardiovascular disease is about 1.5 to 3 times higher than in the rest of Europe. Despite a decline in the percentage of deaths in recent years, it is estimated that between 2001 in 2018 Poland reached the EU index. In addition, based on data provided by Poland's Central Statistical Office (GUS) concerning age structure and Global Disease Disorders (GBD), it is estimated that by 2030 Poland's overall mortality rate will increase by 17-25%, and that ischemic heart disease will remain the most common cause of death [13].

Certain factors may increase the risk of coronary artery disease and its complications and the most important of these come under the heading classical risk factors [14]. These have been divided into two groups: 1. non-modifiable factors: age, male sex and family history for premature heart disease and 2. modifiable factors: smoking, alcohol abuse, chronic stress, diabetes, poor nutrition, hypercholesterolemia, overweight/obesity, hypertension and a low level of physical activity. A prevalence of modifiable classical cardiovascular disease risk factors increases the risk of its development [15, 16]. Modification of one's lifestyle can reduce the risk of mortality by more than 50% [17]. According to the research findings, the attitude of physicians or therapists, their own levels of physical activity, lifestyle and health habits may also affect the healing process of their patients. The education, habits and personal experiences of medical students affect their clinical practice [18].

Aim

To assess the level of physical activity of first-year medical students, including their knowledge of classical cardiovascular disease risk factors and their incidence.

Materials and methods

The study was conducted in 2016 and involved first-year medical students at the Medical University of Silesia in Katowice, Poland. Respondents were informed that the survey would be anonymous and voluntary. Each respondent received verbal instructions on how to fill out the questionnaire. The criterion for exclusion from the survey was a student's refusal to participate in the research.

The study group consisted of 500 students, including 306 women (61.2%) and 194 men (38.8%), ranging from 18 to 26 years of age.

The anonymous questionnaire used in this study was composed of 2 sections. The first of these covered demographical data, while the second focused on physical activity and assessing knowledge about coronary atherosclerosis risk factors. In the questions concerning risk factors, incidence of hypercholesterolemia, diabetes or hypertension included any such disease already diagnosed by a physician, whereas the question concerning risk factors such as smoking, stress and alcohol abuse was marked according to the actual state of affairs declared by the students.

Physical activity levels were assessed by means of the seven-day version of the standardized and validated International Physical Activity Questionnaire (IPAQ). The level of physical activity referred to in the questionnaire was presented in the corresponding metabolic equivalent (1 MET=3.5 ml O₂/kg weight/min) [17, 18]. IPAQ concerns physical activities performed at a high or moderate level, walking, and time spent sitting. The first of these concerns physical activity requiring much effort and quicker breathing, for example fast cycling or aerobic workouts. The indicator of this physical effort (PA1) is calculated on the basis of the data: 8 MET x the number of days per week x minutes spent on the activity per day [min]. The second section of the questionnaire concerns moderate physical activity (PA2) such as cycling or playing volleyball. The indicator of physical effort in this section is calculated on the basis of the data: 4 MET x number of days per week x minutes spent on the activity per day. The third section concerns walking. The Indicator of this type of physical activity (PA3) is: 3.3 MET x number of days per week x minutes spent walking per day. The total value of the indicators referred to above (PA1, PA2, and PA3) was the total physical activity level and energy expenditure in MET-minutes/week (TPA) in the last 7 days.

In accordance with the IPAQ scoring system and on the basis of the total physical activity results obtained (TPA), respondents were assigned to three groups: 1. with a high (HIGH) physical activity level, including those who perform considerable physical activity (>1500 MET) at least 3 times a week for 30 minutes or 20 minutes a day spent walking 7 days a week (3000 MET); 2. those with a medium (MODERATE) level of physical activity who performed hard physical effort at least 3 days a week for 20 minutes or moderate activity for at least 30 minutes a day for a minimum 5 times a week (>600<1500 MET); and 3. consisting of those students with a low level of physical activity (LOW) (<600 MET). The final, fourth section of the questionnaire refers to the amount of time spent sitting during the day.

The results were saved to a database and analysed using the Statistica v.10 software. Descriptive statistics

for the characteristics of the study group are presented as minimum, mean and maximum values and standard deviation. Due to the homogeneity of the group, implementation of data analysis outliers was not necessary [19]. Total physical activity levels were assessed by the IPAQ scoring system; the t-Student test for independent groups was used to compare physical activity levels among women and men. The R-Pearson test was used to evaluate the relationship between the variables. The Chi-square test was performed for non-parametric features.

All results are shown with an accuracy to one decimal point, and $p \leq 0.05$ values were considered statistically significant.

Results

The study group consisted of 500 students, including 306 women (61.2%) and 194 men (38.8%), ranging from 18 to 26 years of age (Table I).

Characteristics of the study group of students according to levels of physical activity as assessed by the IPAQ (Table II).

The different levels of physical activity in the study group ranged from 120 to 9189 MET; women: 120 to 6547 MET (2257.6±928.9) and men: 132 to 9189 MET (2473.1±975.2). The average total energy expenditure in the group amounted to 2357.9 MET. A statistically significant difference between men and women was observed only in the index for hard physical effort (PA1). In addition, it was observed that in the last seven days as many as 105 students (21.0%) had not performed any physical activity requiring a lot of effort (PA1), these being 80 women (26.1%) and 25 men (12.9%).

An analysis was conducted of the surveyed students in terms of time spent in a sitting position. The results showed that they spent an average 7 hours a day in a sitting position. Among the respondents only 6 women (1.9%) and 2 men (1.0%) (n=8; 1.6%)

Table I. General characteristics of the study group of first-year medical students.

Tabela I. Ogólna charakterystyka badanej grupy studentów pierwszego roku medycyny

Variable /Zmienna		Total /Ogółem N=500	Women /Kobiety N=306	Men /Mężczyźni N=194
age (in years) /wiek (w latach)	X±SD min-max	20.0±1.4 18-26	19.9±1.2 18-26	20.2±1.6 18-25
body mass /masa ciała [kg]	X±SD min-max	65.5±9.6 41-100	57.4±8.4 41-100	73.6±10.7 53-100
height /wysokość [m]	X±SD min-max	1.7±0.1 1.4-1.9	1.7±0.1 1.4-1.8	1.8±0.1 1.6-1.9
BMI [kg/m ²]	X±SD min-max	21.5±2.7 15.8-39.1	20.5±2.8 15.8-39.1	22.5±2.6 17.0-28.7

spent one hour or less during the day in a sitting position; 32 women (10.5%) and 23 men (11.9%) (n=55; 11.0%) spent 2-3.5 hours; 71 women (23.2%) and 57 men (29.4%) (n=128; 25.6%) spent 4-6 hours; 152 women (49.7%) and 81 men (41.7%) (n=233; 46.6%) spent 7-9.5 hours; 29 women (9.5%) and 26 men (13.4%) (n=55; 11.0%) spent 10-11.5 hours and 16 women (5.2%) and 5 men (2.6%) (n=21; 4.2%) spent over 12 hours a day in a sitting position.

Taking into account their total energy expenditure (TPA[MET]), the characteristics of the medical students show that the majority of those surveyed (n=301; 60.2%) achieved a sufficient level of physical activity falling within a range of 600-1500 MET. In the case of 15.8% (n=79) of the respondents, their physical activity levels were insufficient. Among women 53 (17.3%) of them achieved high levels, 204 (66.7%) moderate levels and 49 (16.0%) only a low level of physical activity. Among men, 67 (34.7%) achieved high levels, 97 (50.0%) moderate levels and 30 (15.3%) only a low level of physical activity.

Knowledge of first-year medical students concerning classical coronary atherosclerosis risk factors.

Characteristics of the study group of students in terms of their knowledge concerning classical coronary atherosclerosis risk factors are presented in Table III.

Characteristics of the study group of students in terms of the prevalence of classical coronary atherosclerosis risk factors are presented in Table IV. Despite their very young age, the students in the study group showed a prevalence of classical coronary atherosclerosis risk factors, the most frequent being: chronic stress (n=265; 53.0%), a low level of physical activity (n=205; 41.0%) and smoking (n=52; 10.4%).

Characteristics of first-year medical students in terms of correlation between selected parameters.

Characteristics of the study group of students in terms of their levels of physical activity and coronary atherosclerosis risk factors are shown in Table 5.

Chi-square analysis showed no significant correlation between number of risk factors and level of total physical activity ($\chi^2=22,239$; $df=10$, $p=0,139$). It was however observed that an increase in the number of risk factors in the study group was accompanied by a decreasing percentage of high and medium levels of physical activity.

In addition, a total physical activity and BMI analysis was conducted, showing no significant differences between the above-mentioned parameters ($\chi^2=7.779$, $df=6$, $p=0.255$).

Table II. Physical activity by the study group of students
Tabela II. Aktywność fizyczna badanej grupy studentów

IPAQ		Total /Ogółem N=500	Women /Kobiety N=306	Men /Mężczyźni N=194	t	df	p
PA1 [MET]	X±SD min-max	876.2±419.9 0-6720	595.7±281.1 0-4320	1184.7±548.9 0-6720	-4.14	498	0.00
PA2 [MET]	X±SD min-max	299.8±128.4 0-3360	245.4±118.9 0-3360	355.1±156.4 0-2888	1.45	498	0.15
PA3 [MET]	X±SD min-max	1050.2±381.3 495-5544	1112.6±396.7 495-5544	1006.2±373.6 495-4158	0.62	498	0.53
TPA [MET]	X±SD min-max	2357.9±962.4 120-9189	2257.6±928.9 120-6547	2473.1±975.2 132-9189	0.38	498	0.70
Sitting /siedzenie [min]	X±SD min-max	446.1±189.6 45-1020	464.9±196.3 45-900	422.0±182.1 70-1020	1.78	498	0.08

Table III. Knowledge of classical coronary atherosclerosis risk factors in the study group
Tabela III. Wiedza w zakresie klasycznych czynników chorób układu krążenia w badanej grupie

Variable /Zmienne	Total /Ogółem N=500	Women /Kobiety N=306	Men /Mężczyźni N=194
gender /płeć	195 (39.0%)	112 (36.6%)	83 (42.8%)
genetics /czynnik genetyczny	393 (78.6%)	239 (78.1%)	154 (79.4%)
hypertension /nadciśnienie tętnicze	372 (74.4%)	284 (92.8%)	88 (45.4%)
diabetes /cukrzyca	395 (79.0%)	243 (79.4%)	152 (78.4%)
smoking tobacco /palenie tytoniu	462 (92.4%)	280 (91.5%)	182 (93.8%)
low level of physical activity /niski poziom aktywności fizycznej	478 (95.6%)	290 (94.8%)	188 (96.9%)
alcohol abuse /nadużywanie alkoholu	341 (68.2%)	209 (68.3%)	132 (68.0%)
chronic stress /przewlekły stres	456 (91.2%)	274 (89.5%)	182 (93.8%)
overweight /obesity /nadwaga /otyłość	478 (95.6%)	292 (95.4%)	186 (95.9%)
hypercholesterolemia /hipercholesterolemia	442 (88.4%)	282 (92.2%)	160 (82.5%)

Table IV. Characteristics of the study group in terms of the prevalence of classical coronary arteriosclerosis risk factors
Tabela IV. Charakterystyka badanej grupy z uwzględnieniem występowania klasycznych czynników ryzyka chorób układu krążenia

Variable /Zmienne	Total /Ogółem N=500	Women /Kobiety N=306	Men /Mężczyźni N=194
low level of physical activity /niski poziom aktywności fizycznej	205 (41.0%)	144 (47.1%)	61 (31.4%)
hypercholesterolemia /hypercholesterolemia	8 (1.6%)	8 (2.6%)	
overweight /obesity /nadwaga /otyłość	12 (2.4%)	4 (1.3%)	8 (4.1%)
chronic stress /przewlekły stress	265 (53.0%)	153 (50.0%)	112 (57.7%)
alcohol abuse /nadużywanie alkoholu	24 (4.8%)	10 (3.3%)	14 (7.2%)
smoking tobacco /palenie tytoniu	52 (10.4%)	30 (9.8%)	22 (11.3%)
diabetes /cukrzyca	2 (0.4%)		2 (1.0%)
hypertension /nadciśnienie tętnicze	22 (4.4%)	2 (0.7%)	20 (10.3%)
genetics /czynnik genetyczny	42 (8.4%)	24 (7.8%)	18 (9.3%)

Table V. Characteristics of the study group of students in terms of their levels of physical activity and coronary atherosclerosis risk factors
Tabela V. Charakterystyka badanej grupy studentów w odniesieniu do ich aktywności fizycznej i występujących czynników ryzyka chorób układu krążenia

Risk factors /Czynniki ryzyka	Level of physical activity /Poziom aktywności fizycznej								
	high /wysoki			moderate /umiarkowany			low /niski		
	Total /Ogółem N=120	Women /Kobiety N=53	Men /Mężczyźni N=67	Total /Ogółem N=301	Women /Kobiety N=204	Men /Mężczyźni N=97	Total /Ogółem N=79	Women /Kobiety N=49	Men /Mężczyźni N=30
0	51 (42.5%)	21 (39.6%)	30 (44.8%)	78 (25.9%)	44 (21.6%)	34 (35.1%)	18 (22.8%)	13 (26.5%)	5 (16.7%)
1	25 (20.8%)	8 (15.1%)	17 (25.4%)	106 (35.2%)	78 (38.2%)	28 (28.9%)	24 (30.4%)	15 (30.6%)	9 (30.0%)
2	29 (24.2%)	15 (28.3%)	14 (20.9%)	87 (28.9%)	62 (30.4%)	25 (25.8%)	21 (26.6%)	12 (24.5%)	9 (30.0%)
3	7 (5.8%)	4 (7.5%)	3 (4.5%)	21 (7.0%)	15 (7.4%)	6 (6.2%)	16 (20.3%)	9 (18.4%)	7 (23.3%)
4	2 (1.7%)	2 (3.8%)		7 (2.3%)	5 (2.5%)	2 (2.1%)			
5	6 (5.0%)	3 (5.7%)	3 (4.5%)	2 (0.7%)		2 (2.1%)			

Discussion

Cardiovascular diseases are not only a significant health problem, but also have a socioeconomic impact, so prevention programs present public health institutions a serious challenge. Educational initiatives have been undertaken in this area, but their effectiveness is still limited. Even where patients have some knowledge about prevention and health promotion activities, they fail to apply them in daily life. Medical professionals play an important role in this issue. Medical students are a special group. In view of the profession they are following, they are required to not only have knowledge in this area but also to apply that knowledge in daily life and maintain a healthy lifestyle. Based on the questionnaire, the students' knowledge regarding physical activity was found to be insufficient, with 41% of respondents rating their physical activity as too low, whereas the results of the IPAQ questionnaire estimated that 84.2% of the subjects maintained a sufficient (moderate or high) level of physical activity. Lack of exercise, observed not only among older people but increasingly also in the young can lead to the early development and progression of coronary heart disease. A sedentary lifestyle doubles the risk of cardiovascular disease [21]. The study shows that 437 (87.4%) of the surveyed

students spend their leisure time sitting – more than 4 hours a day, with another 76 (15.2%) sitting more than 10 hours a day.

The conducted study assessed a group of first-year medical students in one of Poland's medical schools. A seven-day version of the standardized and validated International Physical Activity Questionnaire (IPAQ) was used to assess levels of physical activity. The main aim of the study was to show the important role of physical activity levels among medical students and their knowledge on the subject enabling them to later promote healthy lifestyles and physical activity among their patients. Other studies have shown that physiotherapists have the highest level of physical activity compared to other physicians. For this reason, an assessment of physicians and medical students in this respect is an important aspect of an interdisciplinary approach to the treatment of patients.

Research has shown a close connection between the everyday habits of physicians and their health recommendations for their patients. The educational results of students, as well as their habits and personal experiences are of great importance in clinical practice [6]. Shirley et al. showed that in the opinion of physiotherapists and physiotherapy students, since therapists have direct contact with patients they

should be knowledgeable about physical activity and its health benefits and pass this knowledge on to their patients. In clinical practice, the promotion of physical activity should be an essential part of medical consultation [22]. The presented study shows that the most common coronary artery disease risk factors among medical students are stress and a low level of physical activity. The direct connection between chronic stress and the development and progression of atherosclerosis and other cardiovascular diseases may be due to dysfunction of the endothelium or arteriosclerosis plaque rupture. Arousal of the sympathetic nervous system is accompanied by an accelerated heart rate, increased blood pressure and stroke volume and as a consequence, increased oxygen intake by the heart muscle. There simultaneously occurs a contraction of the peripheral arteries, vascular resistance increases and blood flow is reduced. In addition, it is believed that chronic stress may indirectly affect the incidence of other risk factors such as smoking, which was one of the three most common risk factors among the students surveyed [23]. A study by Stanford et al. concerning levels of physical activity among physicians, medical students and residents showed that doctors and medical students are more physically active and have a lower body mass index, compared to the results for these parameters in the general population. It was suggested that the advice physicians provided patients concerning health behaviours and keeping active very much depends on their own level of physical activity. Quality of healthcare and the level of consultation on these issues are low [24]. Research shows that only one out of three patients performs the physical activity recommended by their physician [25]. A study by Dąbrowska, et al. regarding physical activity levels among students of medicine, physiotherapy, midwifery and nursing showed that the highest activity level was among students of physiotherapy. In contrast, among the surveyed students it was medical students who formed the largest group with low physical activity levels (26%) [26]. Our study's results showed that the majority (60.2%) of medical students maintained a moderate (adequate) level of physical activity, whereas 24.0% had a high level and 15.8% maintained only a low level.

The study also assessed the incidence of cardiovascular disease risk factors in the first-year medical students. It was noted that the most common were: chronic stress (53.1%), low physical activity (41.0%), smoking of tobacco (10.4%), genetics (8.4%), alcohol abuse (4.8%) and hypertension (4.4%). Taking into account the respondents' young age, the risk factors among the study group were significant. Similar results were obtained in studies by Ibrahim et al. showing a high incidence of risk factors in the studied

group of medical students, the most frequent being high fat diet (73.4%), physical inactivity (57.9%), overweight/obesity (31.2%), everyday consumption of fast food (13.1%), hypercholesterolemia (17.2%) and hypertension (9.3%). However, only 2.8% of respondents smoked, the result, as the authors emphasized, of a 'smoke-free campus' program. This proves the necessity and need to run educational and health programs among students [27].

In a study by Arts et al. more than half of young people aged 18-24 are burdened with at least one risk factor, and 1/4 of them have had atherosclerotic lesions. It has been shown that the stage of atherosclerosis correlates with the number of risk factors. In addition, our study found a statistically significant connection between number of risk factors and level of physical activity. Among students with more than one risk factor, a smaller percentage maintained a high level of physical activity compared to those unburdened by any risk factors.

Improper dietary habits contribute to weight problems, obesity and dyslipidemia. Low physical activity, chronic stress and smoking are factors strongly predisposing one to hypertension. Profiles of risk factors among youth clearly predict the long-term risk of coronary heart disease when they are older. Early detection is crucial in order to identify people in the 'high risk group' and to promote a healthy lifestyle among them before progression of the disease. Eighty percent of heart disease is associated with lifestyle, and young adults are an ideal target for preventive activities in this area, since they are in the process of shaping the bad habits associated with it [28].

The physical activity of physicians plays a significant role. Research shows that more often than other physicians, those who are physically active recommend physical exercise to their patients and encourage healthy lifestyles. Lifestyle modification with the elimination of coronary atherosclerosis risk factors is the main aim in preventing development of coronary heart disease and its progression and consequently – the prevention of complications. Conscious co-operation between physician and patient, an understanding of the necessity of these activities and the availability of medical services can contribute to a pro-health lifestyle change among patients, their active participation in the elimination of modifiable risk factors, and their taking control of their health and treatment. In addition, the extensive knowledge of doctors when providing advice combined with them presenting their own healthy habits, including high levels of physical activity, constitute a reliable source of information for the patient and worthy role models [20].

Similar research among 5th and 6th year students is planned for the future in order to compare possible

changes in their physical activity and knowledge regarding risk factors, as well as to compare differences between particular medical schools. There is a justifiable need for further research in this area, as the habits and knowledge acquired by students during their medical education contribute to more effective treatment of patients in their later professional careers as doctors.

Conclusion

1. There is a high or satisfactory level of knowledge among first-year medical students concerning poor physical activity as a cardiovascular diseases risk factor, while their knowledge of other risk factors is incomplete.
2. Despite their young age, first-year medical students are burdened with modifiable coronary ath-

erosclerosis risk factors, especially a sedentary lifestyle, chronic stress and the smoking of tobacco.

3. The prevalence of classical atherosclerosis risk factors in the studied group of medical students and their insufficient knowledge regarding that issue suggests the need to introduce more classes on such subjects as sport, physical activity, health education and promotion, according to the principle of promoting primary prevention and a healthy lifestyle.

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