
PREVENTION OF CARDIOVASCULAR HEALTH IN ADOLESCENTS – LONG-TERM INVESTMENT IN THE PROTECTION AND EMPLOYABILITY OF ADULTS

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Abstract: The health status and future working capacity of the population is determined by factors whose influence begins early in childhood and adolescence. Over the past 30 years there has been an outbreak of cardiovascular disease. This necessitates a search for the causes in childhood and adolescence and conducting timely health promotion and prophylaxis.

The aim of the study is to reveal the presence of risk factors for cardiovascular disease in 706 adolescents aged 13 to 18 years.

A documentary method, a sociological method, a statistical method and a method of graphical analysis of the results were used.

Analysis of the data indicates that smoking is one of the main adjustable risk factors. There is a hereditary burden with one or more risk cardiovascular risk factors. Measurement of blood pressure in adolescents is neglected. Almost a quarter of respondents do not practice any sport.

The conclusions we made in the course of the study are that, despite the many health-prophylactic programs, there is virtually no systemic algorithm for the promotion and prevention of cardiovascular diseases in children. There is a need and desire to raise awareness among young parents, their children and students about issues related to the prevention of cardiovascular risk.

The role of the nurse in conducting health promotion and prevention is neglected. It is important for children's heart health to avoid the impact of risk factors and a prophylactic program, following clear goals and priorities to be done by nurses present in children's life from birth, crèches, kindergartens and schools.

Keywords: prevention, cardiac health, risk factors, adolescents

1. INTRODUCTION

In Bulgaria, over the last decades, there has been a cardiovascular disease (CVD) epidemic, which is becoming increasingly threatening. They are one of the most important social diseases in modern society and a major cause of the global burden of diseases in the European region, as they cause high lethality, early disability, losing years of active life, losing to the loved ones, costly treatment and rehabilitation, decreased quality of life, difficulties in the management of therapeutics and avalanche spread.¹ They are ranked third in disability statistics and first among the causes of disability.²

¹ Сергеева, Т. (2010). Обучение на пациенти със сърдечно-съдови заболявания и преживян миокарден инфаркт от професионалисти по здравни грижи – необходимост и перспективи. – *Здравни грижи*, 2, р. 32. Терзиева, Г., К. Попова (2015). Рискови фактори за развитие на сърдечно-съдови заболявания – реалности, тенденции. – *Управление и образование. Том XI (5)*, р. 50. Цолова, Г., Н. Василевски, П. Димитров, А. Манолова (2010). „Здрави деца в здрави семейства”, Изследване на факторите на риска за хронични неинфекциозни болести сред учениците на 14-18 г. в зоните на програмата Синди – България, 2008. – *Българско списание за обществено здравеопазване, том 2, книга 3*, 36-58. Цолова, Г., Н. Василевски, П. Димитров (2015). Здрави деца в здрави семейства – детска компонента на програмата Синди – България (II част). – *Социална медицина*, 2, pp. 22, 23, 24, 25. Европейска харта за сърдечно здраве. Source: <http://www.heartcharter.org/download/Bulgarian.pdf> Посетен на 20.1.2017 г. Георгиева, Ж. Профилактика на сърдечно-съдовите заболявания според Европейските препоръки. *Превантивна кардиология*, 24-28. Йотов, Й. (2011). Съвременни аспекти на профилактиката на сърдечно-съдовите заболявания. – *Мединфо. Бр. 1, Година XI*, 5-10. Кинова, Е., А. Гудев (2010). Оценка на риска и корекция на дислипидемията за първична превенция на сърдечно-съдовите заболявания. – *Обща медицина*, 12, №2, 37-40. *Национална програма за превенция на хроничните незаразни болести 2014-2020, Приложение 1*. Димитрова, Д. (2013). Механизми на кардиопротективния ефект на физическата активност. – *Сърдечно-съдови заболявания*, 44, №2, 39-44. Дякова, М., Е. Караславова, Т. Димитрова (2008). Първична профилактика на сърдечно-съдовите заболявания - съвременни терапевтични подходи и предизвикателства. – *Наука кардиология*, 6, 261-264. Шипковенска, Е. (1997). *Сърдечно-съдовият риск – все още нерешен проблем. В глава 4 Епидемиология на*

The cause of CVD has been in the widespread prevalence of risk factors, which in many cases stem from childhood and adolescence, with a tendency to increase with age. There is apparently "rejuvenation" in the risk of cardiovascular health.³

In June 2007, Europe voted for a European Heart Health Charter, which was adopted and signed by the Bulgarian Minister of Health in 2008. The motto of the European Heart-Health Charter is "Every child born in the new millennium has the right to live at least until the age of 65 without suffering from preventable cardiovascular diseases."⁴

Art. 6 of the European Charter on Cardiovascular Health states that "A comprehensive approach to risk factors should be started as early as childhood" in order to stem the unfavorable rise of the GCC in adulthood.⁵ For this purpose, it is necessary to avoid the influence of risk factors for health, to reveal the carriage of risk factors for GCC in children and to take measures to prevent their harmful effects. This requires health promotion and early childhood prophylaxis to build a mature person with health education and a worldview aimed at reducing risk factors for cardiac health and increasing factors that have a protective role in their heart health. The need for early childhood health education is conditioned by the fact that in this early childhood health is laid and future health behavior is formed. These facts determine the promotion of health and disease prevention as fundamental in the fight against chronic non-communicable diseases, some of which are cardiovascular.

2. OBJECTIVE, TASKS AND METHODOLOGY

The aim of the study is to investigate and analyze the prevalence of the main risk factors for cardiovascular disease in adolescents aged 13 to 18 years.

The tasks we have set are to explore and analyze:

- 1.Smoking and hereditary burden as cardiovascular risk factors;
- 2.Measurement of blood pressure as part of the prevention of CVD.
- 3.Frequency and duration of physical activity as a protective cardiovascular factor.

The subject of the study are the risk factors for cardiovascular health. The object of the study are adolescents aged 13 to 18 years old from 9 settlements in Bulgaria. The survey included 706 students aged 13 to 18 years old. A sociological method was used to achieve the goal – a direct, individual, anonymous survey was conducted, using questionnaire made specifically for the purpose. A documentary method, a statistical method and a graphical analysis of the results were used. Quantification is done with a statistical suite of application programs – SPSS 17.0.

3. RESULTS ANALYSIS

The survey involved 706 students aged 13 to 18 from different settlements on the territory of the country. Of these, 52.1% are girls and 47.9% are boys. The highest share of respondents is from Pernik (25.1%), second is from Sofia (19.4%), third is from Tsarevo (13.6%), fourth is from Knezha (12.9%), and at fifth place is the city of Plovdiv (9.7%). The relative share of the respondents from the town of Galabovo (4.0%) is the lowest. The data are graphically represented in Fig. 1.

широко разпространените неинфекциозни заболявания. Съвременна епидемиология под редакцията на доц. д-р Невяна Фесчиева, к.м.н. Варна. Изд. Конивиста, 127-140. Попова, Т. С., Бикова П. Р. (2017). Необходимост сътрудничества педагогов и медицински специалисти в борба с сърдечно-сосудистими заболяваниями. – В: Общество и образование в XXI век: опит, традиции, перспективи (Седьмые Лозинские чтения). Международной научно-методической конференций (24-27 апреля 2017 г.), г. Сочи, Часть I, Псков: Псковский государственный университет, 44-49.

² Бахчеванджиева, Р. (2015). Профилактика на сърдечно-съдовите заболявания. – *Медицина и спорт. 1-2*, 22-25

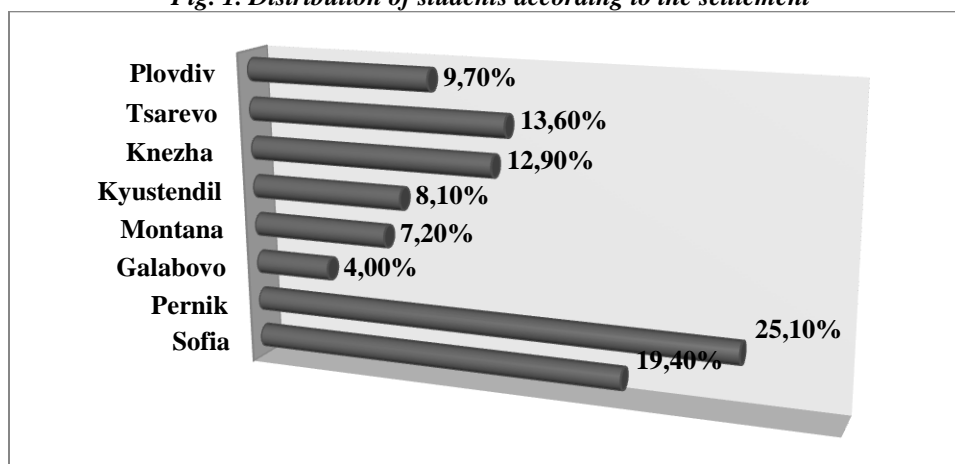
³ Георгиева, С. *Рискови фактори при деца в България.* – Source:

http://www.sustz.com/Proceeding08/Papers/MEDICINE/Georgieva_Stela.pdf, p. 1. 13,14,11]

⁴ Воденичаров, Ц., С. Попова, М. Мутаfoва, Е. Шипковенска (2013). – *Социална медицина*. ИК „Горекс Прес“, София. Йотов, Й. (2011). Съвременни аспекти на профилактиката на сърдечно-съдовите заболявания. – *Мединфо. Бр. 1*, Година XI, 5-10.

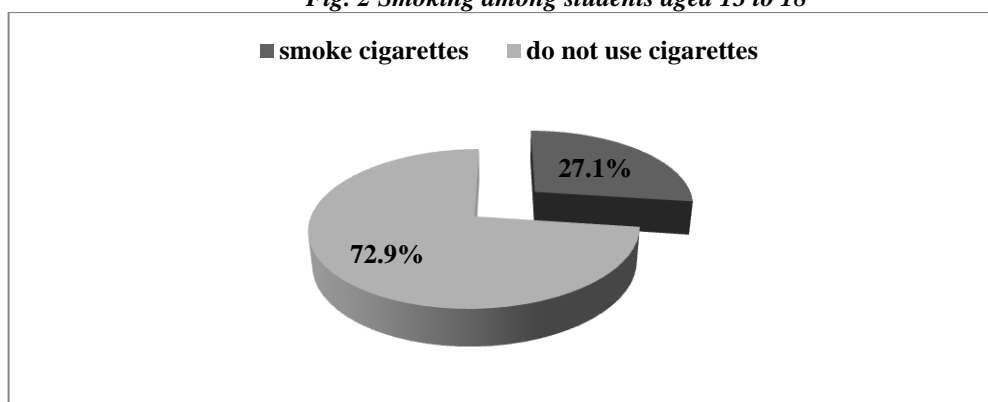
⁵ Европейска харта за сърдечно здраве. Source: <http://www.heartcharter.org/download/Bulgarian.pdf> Посетен на 20.1.2017 г.

Fig. 1. Distribution of students according to the settlement



In the course of the study, active smoking among respondents was studied. It is considered as a major correctional risk cardiovascular factor, which had a significant impact on the future health and work capacity of the population. More than a quarter (27.1%) of the students in this age group smoke cigarettes. The rest (72.9%) claim they do not use tobacco products. The data are graphically represented in Fig. 2.

Fig. 2 Smoking among students aged 13 to 18

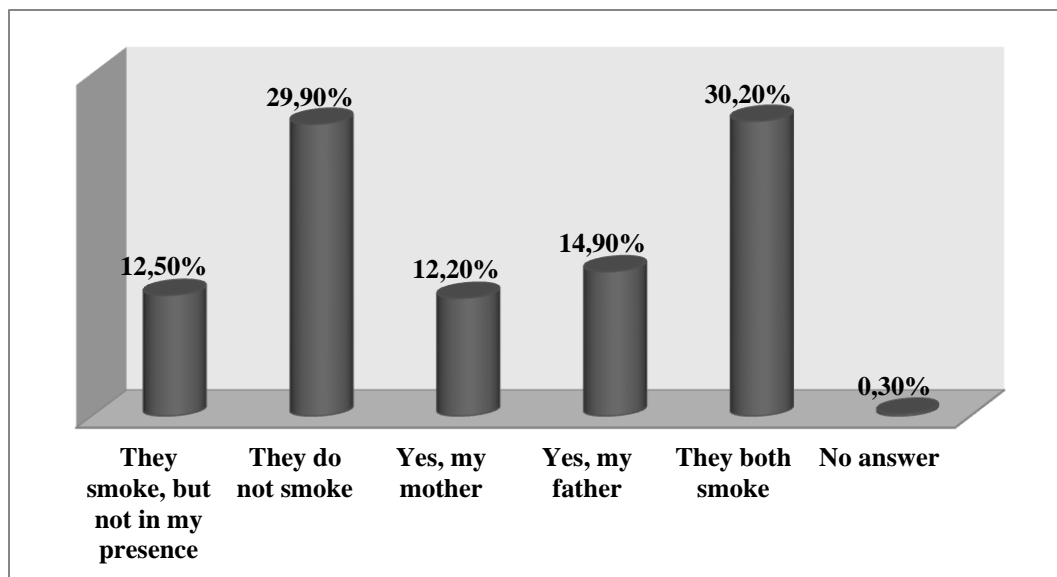


Smoking is defined as a major and modifiable lifestyle related risk factor. This fact emphasizes the need for early prevention in order to prevent clogging and impacts on the cardiovascular system and work capacity, both in school and adulthood.

On cardiovascular health, respectively future work capacity, both smoking as a whole and the number of cigarettes smoked daily. In the study of the number of smoked cigarettes daily it was found that with the highest share (7.8%) are the respondents who smoked daily 6-10 cigarettes, followed by those that smoke 11-15 cigarettes a day - (7.3%) and the third place is for the pupils who smoke up to 5 cigarettes a day - 6.2%. Not small (4.8%) is the proportion of pupils who smoke 16-20 cigarettes a day. The smallest (1.0%) is the relative share of respondents who smoke more than 1 box of cigarettes.

In order to reveal passive smoking among students, we asked them about the presence of smoking among their parents. The highest (30.2%) is the share of respondents who are exposed to passive smoking by both the mother and the father. Secondly (14.9%) are those who are exposed to passive smoking by the father and third (12.2%) on the part of the mother. 42.4% responded that their parents did not smoke in their presence, of which 29.9% did not smoke in principle and only 12.5% of parents smokers did not smoke in the presence of their children. The data are graphically illustrated in Fig. 3.

Fig. 3. Smoking of parents in the presence of children (respectively passive smoking of the students)



In the course of the study, we also investigated the hereditary burden of respondents' CVD as a factor affecting heart health and work ability in the future. A relatively high percentage (45%) of respondents, have no information on the presence of a disease or condition of the mother. Of the respondents who reported the maternal cardiovascular risk factor, the highest proportion was 7.2% of overweight and/or obesity. 3.4% report that their mother has elevated blood lipids, 3.1% arterial hypertension, and 1.4% with diabetes mellitus. The lowest (0.1%) is the relative share of respondents reporting a surviving maternal myocardial infarction. The data are tabulated on Table 1.

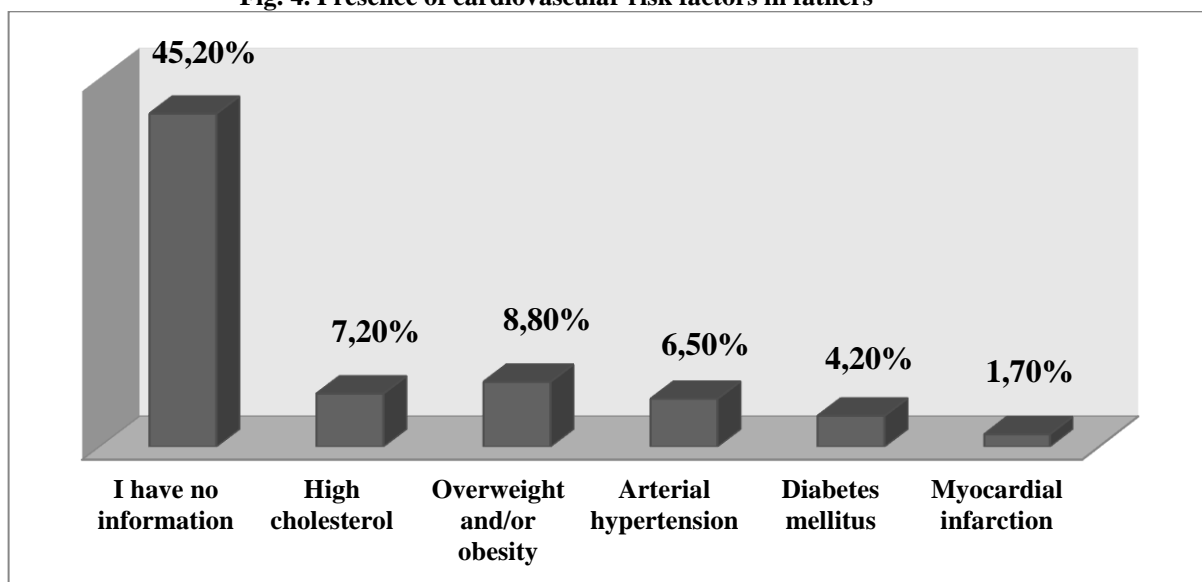
Tab. 1 Carrying of maternal cardiovascular risk factors

Risk factor for CVD	Relative share in %
High cholesterol	3.4%
Overweight and/or obesity	7.2%
Arterial hypertension	3.1%
Diabetes mellitus	1.4%
Myocardial infarction	0.1%
2, 3 of more risk factors	2.9%

Although approximately half of the respondents have no information on carriage of risk factors for cardiovascular health are also found parents with 2 or more risk factors. The most common combination (7) is the combination of overweight risk factor with arterial hypertension, followed by overweight and diabetes (5) and overweight and high cholesterol (4). Two of the mothers have high lipids and arterial hypertension, one of which is arterial hypertension and diabetes mellitus. One of the mothers carries the risk factors of high cholesterol, overweight, diabetes mellitus and is experiencing a myocardial infarction.

The highest (8.8%) is the proportion of fathers with overweight and/or obesity, followed by elevated blood lipids - 7.2%, arterial hypertension - 6.5% and diabetes mellitus - 4.2%, respectively. The lowest (1.7%) is the relative share of fathers with experienced myocardial infarction. The data are presented graphically in Fig. 4.

Fig. 4. Presence of cardiovascular risk factors in fathers

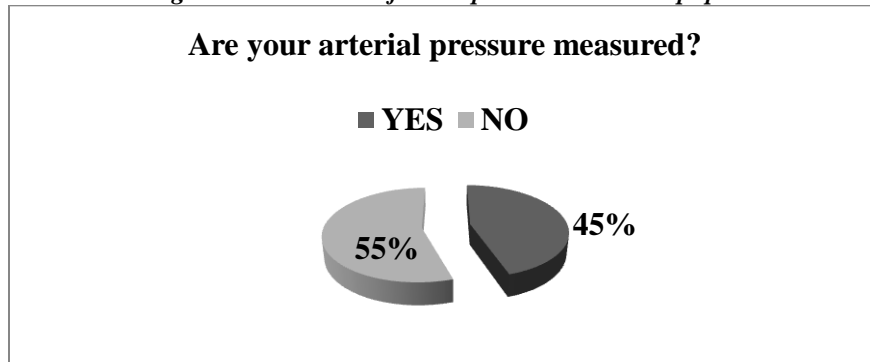


Approximately 5.8% of respondents report the carriage of 2, 3 and more than 3 risk factors for cardiovascular disease of their fathers. The largest proportion (15) is the presence of two risk factors - overweight and hypertension, followed by carriage of elevated blood lipid levels and overweight (6). 4 of them have elevated blood lipids and arterial hypertension, 2 overweight and diabetes, 2 with elevated lipids and diabetes mellitus, 2 with arterial hypertension and diabetes mellitus, one of the respondents reports increased cholesterol and survival myocardial infarction, another for the presence of diabetes mellitus and myocardial infarction experienced. 7 of the respondents report a set of three and more than three risk factors of the father. 2 of the fathers have a combination of elevated blood lipids, overweight, and arterial hypertension. In another combination - experienced myocardial infarction, arterial hypertension and elevated cholesterol. Another combination of risk factors in one of the respondents is overweight, arterial hypertension and diabetes mellitus. 2 have elevated lipids, arterial hypertension and diabetes mellitus. 2 others have a combination of 4 risk factors - elevated cholesterol, overweight, arterial hypertension and diabetes mellitus.

Data analysis indicates that approximately 15% of respondents are inherited with maternal risk-bearing cardiovascular factors and approximately 28% of the father. Although the hereditary burden is an uncorrectable risk factor, these children have cardiovascular risk without taking into account their way of life and require active searching, risk aggregation and purposeful training. The hereditary burden cannot be changed, but the lifestyle of the pupils may be changed and the fact that any risk factor for cardiovascular disease leads to another risk factor and their aggregate increases the future risk for CVD.

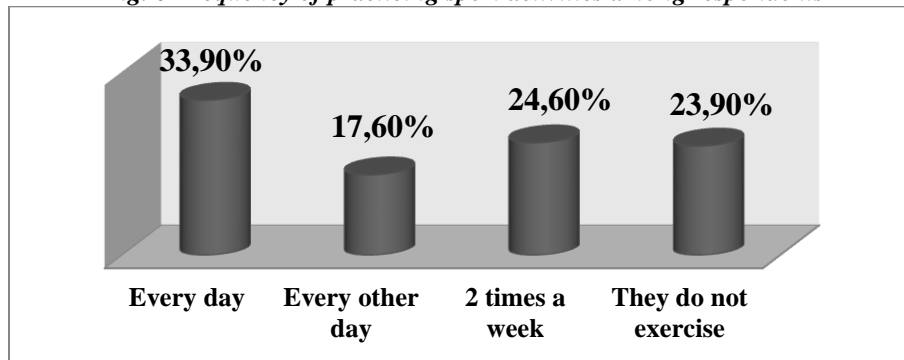
In the course of the study, we attempted to investigate the measurement and monitoring of blood pressure in respondents as part of the prevention of cardiovascular risk. According to the legislation in force in Bulgaria, monitoring of blood pressure is performed once a year in children aged 7 to 18 years. Data analysis shows that blood pressure was measured in 45% of the respondents, while the remaining 55% gave a negative response. The data are presented graphically in Fig. 5.

Fig. 5 Measurement of blood pressure values in pupils



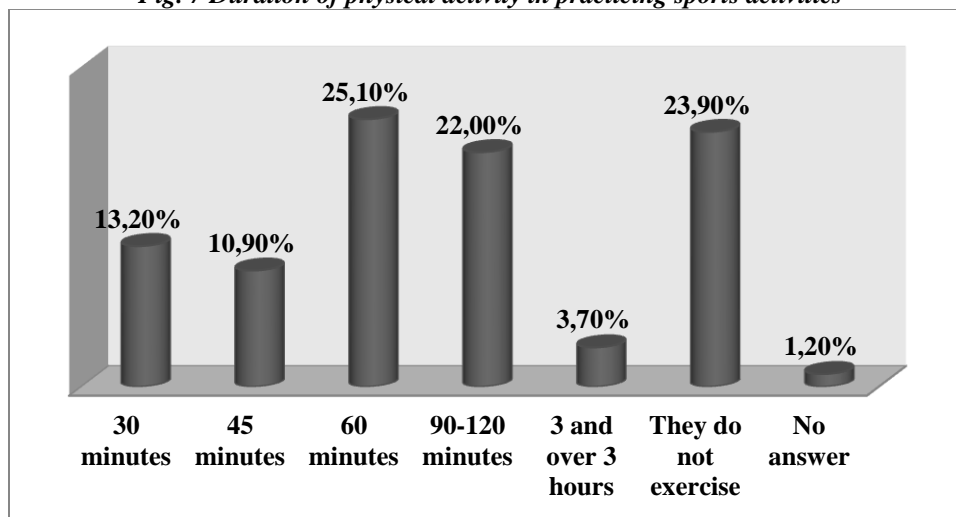
We have also studied sporting activities and the duration of physical activity as a protective factor with regard to CCD. The highest share of respondents (33.9%) is engaged in sports activities. Twice a week - 24.6% of them. Third, with a relatively high share - 23.9% are respondents who do not exercise any kind of sport. The smallest share is the share of students who exercise day by day - 17.6%. The data is presented in Fig. 6.

Fig. 6 Frequency of practicing sport activities among respondents



Here again, the relative share (23.9%) of respondents who do not exercise any kind of sport is preserved. The highest (25.1%) is the relative share of respondents who have 60 minutes of physical exercise activity. Second and third are students who exercise 90-120 minutes and 30 minutes a day - 22% and 13.2% respectively. Fourth (10.9%) are the respondents who spend 45 minutes on training. The lowest (3.7%) is the relative share of students who practice 3 hours and sometimes more than three hours. The data are presented graphically in Fig. 7.

Fig. 7 Duration of physical activity in practicing sports activities



4. CONCLUSIONS

The conclusions we made from the results of the study are that:

1. 58% of students are undergoing passive smoking at home and almost every third pupil aged 13-18 years is actively smoking, which determines adolescent smoking as a major public health problem affecting future health and work ability.
2. There is a hereditary burden with one or more risk cardiovascular risk factors in the respondents, which requires the introduction of prophylactic programs that take into account the hereditary burden and conducting screening programs in order to maximally preserve the health and performance of adolescents.
3. Arterial pressure is measured by only 45% of respondents, and the lack of data on blood pressure in adolescence does not allow for a timely prophylaxis of CVD.
4. Almost every fourth student does not exercise any sport, and this is a prerequisite for increasing the time spent in adynamics, increasing the risk of weight gain, and hence increasing the risk factors for the occurrence of CVD.

In conclusion, the observed CVD epidemic in the last decades requires the search for their causes in childhood and adolescence and the taking of timely preventive actions in order to avoid the negative influence of the risk factors reduce the disease and increase the working capacity of the future generation. There is a need to pursue targeted and sustained efforts to prevent CVD from earliest childhood and not to actions that are directed to their treatment after they have already occurred. Prevention should be complex. Start with young parents, continue with childbirth and raising children until they are mature people with a healthy and healthy lifestyle.

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