Life in Health 2018:

Research and Practice

Proceedings
of the International Conference
held on 6–7 September 2018

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Masaryk University
Brno 2018

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The proceedings is part of the following project: Research on the curriculum of physical education and health education among preschool and younger school age children (MUNI/A/0877/2017).

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ISBN 978-80-210-9178-8

https://doi.org/10.5817/CZ.MUNI.P210-9178-2018

Contents

Introduction

The interdisciplinary conference *Life in Health 2018* took place on 6 and 7 September 2018 at the Faculty of Education, Masaryk University in Brno, Czech Republic. The conference was held by the Department of Physical Education and Health Education of the Faculty. The conference focused on health promotion and lifestyle among children, youth, adults and seniors.

Almost 40 papers were presented, some of which are included in the proceedings. The conference was based on previous events of the Faculty focusing on the promotion of public health and health education. In this respect, a tradition was established some years ago at the Faculty of Education, Masaryk University. The organizers of the conference would like to continue this tradition in the coming years. In terms of content, these conferences are relatively broad and provide space for topics relating to holistic health promotion and health education. This includes research-based and theoretical knowledge of educational, healthcare, medical, psychological and social disciplines, thus combining the perspectives of various specialists in health promotion. The knowledge presented is then implemented is study programmes aimed at the education of teachers and other educators.

The papers published in the proceedings represent both general and specific approaches to the promotion of public health, and can be adequately used in the education of children as well as the general population.

Vladislav Mužík

Chair of the conference organizing committee

Children Health Study 2016

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Abstract: The health status of the child population has been monitored within The Environmental Health Monitoring System since 1996. The fifth phase of this monitoring (Children Health Study 2016) was carried out in 2016.

The aim of the study was to describe the cardiovascular health, the prevalence of allergic diseases, postural abnormalities and obesity in children. At the same time, information on lifestyle was collected. This study was the fifth in the sequence of the surveys, which enabled us to evaluate 20-year trends in allergic diseases and obesity.

The data were collected during preventive examinations of children aged 5, 9, 13, and 17 years in collaboration with 46 general paediatricians in the Czech Republic (CR). The children were randomly assigned to the study. The paediatricians provided data on the health status of children including the measured values of weight, height, blood pressure, and blood lipid levels in selected subsample of children with familial risk of atherosclerosis. The data on the child's lifestyle were taken from the parental questionnaire.

Overall allergic diseases were diagnosed in 29% of children; the prevalence has not changed significantly in the last ten years (2006–2016). The prevalence of asthma has reached 10%. Increased blood pressure detected at screening examinations was found in 10% of children as well. The non-physiological level of total cholesterol had 40% of children with a positive family history of atherosclerosis.

Key words: allergy, cardiovascular risk factors, anthropometric parameters, obesity, lifestyle, children, Czech Republic

In the Czech Republic, the health status of the adult and child population, has been monitored not only by routine health statistics but also by regular population surveys. These surveys provide highly important and otherwise unavailable information as they allow data to be evaluated on an individual level, and enable identification of the chronic diseases risk factors such as socio-economic conditions or lifestyle.

One of the regular recurrent surveys focused on children is the investigation of the National Institute of Public Health in Prague, carried out under The Environmental Health Monitoring System (http://www.szu.cz/umzso). These investigations have been ongoing since 1996 in cooperation with Czech regional public health centres, health institutes and paediatricians. Identical methodology was used in the same 18 cities at five-year intervals in 1996, 2001, 2006, 2011 and 2016. While the first four surveys focused namely on the prevalence of allergies and respiratory diseases, in 2016 the scope of the study was extended to the cardiovascular health, postural abnormalities (faulty posture), and related children's lifestyle behaviours. This so far last survey was called "Children's Health Study 2016". The reason for widening the focus was, among other things, the fact that atherosclerosis can begin already in childhood and its extent is influenced by cardiovascular risk factors such as hypercholesterolemia, obesity, hypertension, and cigarette smoking. Thanks to collaboration with paediatricians, it was possible to obtain objective data not only about the weight and height of children, but also about their blood pressure and in selected subsample of children the level of blood lipids as well.

1 Objectives

The aim of this report is to summarize the basic findings of the Children's Health Study 2016 including the 20-year trend of allergic diseases and obesity, and to describe the prevalence of hypertension, lipid levels, the prevalence of faulty posture and, last but not least, some indicators of children's lifestyle.

2 Methods

Children's Health Study 2016 was conducted during the preventive check-ups of children aged 5, 9, 13, and 17 years in surgeries of 46 general paediatricians in selected cities of the Czech Republic (CR). The participating paediatricians were selected with respect to the city size to obtain a representative sample of about 1,500 children in each age group. The children were included in the study at random by the paediatrician when presenting for preventive check-ups according to the month of birth. Each participating paediatrician was supposed to examine 30 children from each age category, i.e. 120 children in total.

The study included a questionnaire survey aimed at allergic diseases, obesity, cardiovascular risk factors, and locomotor disorders in childhood. The data on the child's diseases and life style were taken from the parental questionnaire. Anonymized data were provided based on parental informed consent. The study was supported by the Society of General Paediatricians.

3 Results

Overall, data on 5,132 children were obtained. Boys and girls were equally represented (51% of males and 49% of females). Each age group (5, 9, 13, and 17 years) comprised around a quarter of the cohort under study.

3.1 Allergic diseases

Twenty nine percent of children were physician diagnosed with an allergic disease (and followed up for allergy). The incidence of allergic diseases was increasing with increasing age from 22% in 5-year-olds to 35% in 17-year-olds. Males were significantly more affected (32%) by allergic diseases in general and by respiratory allergy in particular than females (27%) ($p < 0.001$).

Ten percent of children were diagnosed with asthma. Boys were more often affected than girls, and the incidence of asthma was increasing with increasing age. Thirteen percent of children were diagnosed with seasonal pollen rhinitis. Significantly more patients were boys, and the incidence of seasonal pollen rhinitis was increasing with increasing age. The incidence of year-round allergic rhinitis is also significantly higher in boys and is increasing with increasing age.

Ten percent of children were diagnosed with atopic eczema, comparably in both sexes and all age groups.

The trends in allergic diseases in childhood can be determined since 1996 when the monitoring started (Figure 1). Between 1996 and 2006, there was a significant increase in the prevalence of allergic diseases from 17% to 32% ($p < 0.001$). The increase stopped in 2011, and the prevalence showed a slight decrease to 30% ($p = 0.007$). The prevalence of allergic

diseases was 29% in 2016, being the same as in 2011. The prevalence of allergic diseases did not change in any age groups since the previous investigation. The only change was observed for atopic eczema, the prevalence of which slightly declined from 11% in 2011 to 10% in 2016 ($p = 0.037$).

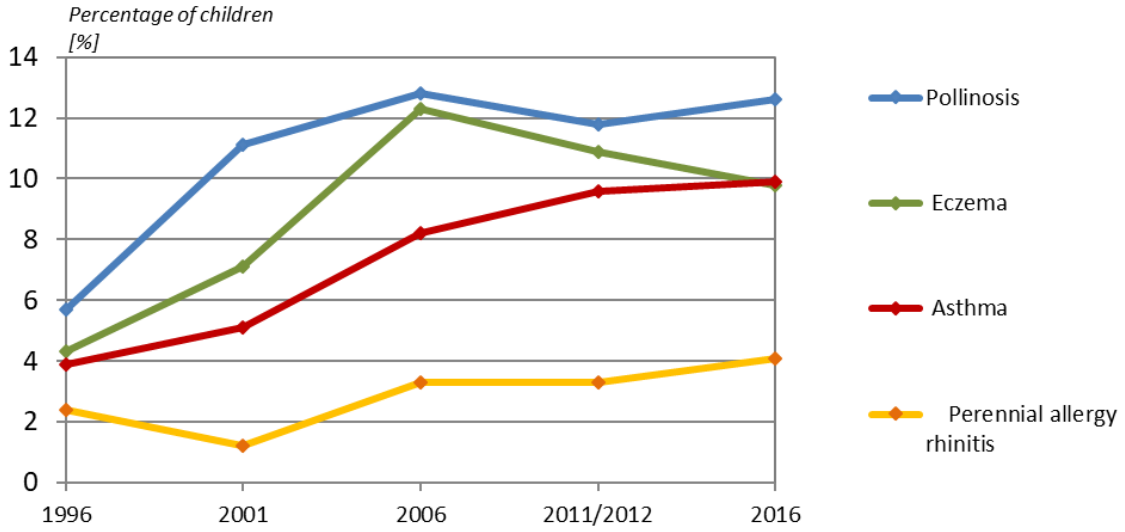

Figure 1. The trend of allergy prevalence in children in 1996–2016.

3.2 Blood lipid levels

Five-year-old and 13-year-old children with a positive family history have been tested for lipid profile (total plasma cholesterol level, LDL cholesterol, HDL cholesterol, and triglycerides). Children at risk of developing cardiovascular disease (CVD) are commonly referred to specialists. Within the study, 740 children were tested. The average levels were 4.25 mmol/l for total cholesterol, 2.51 mmol/l for LDL cholesterol, and 1.43 mmol/l for HDL cholesterol. The average levels of all cholesterol indicators were significantly lower in boys than in girls. The highest average levels of total cholesterol and LDL cholesterol were found in the smallest, 5-year-old children and are physiological at this age. The total cholesterol levels in children were divided into three categories based on Guidelines for the diagnosis and treatment of dyslipidemia in children and adolescents (Šamánek & Urbanová, 2008). Optimal levels were found in 60% of children, borderline levels in 26% of children, and pathological levels in 14% of children.

The average blood triglyceride level (1.00 mmol/l) found in children falls in the range of borderline levels (1.0–1.5 mmol/l) and was comparable in both males and females. Altogether 12% of children had pathological levels of triglycerides. Older children had significantly higher levels than the younger ones (Figure 2), which probably reflects the age-related changes in eating habits and frequency of physical activities.

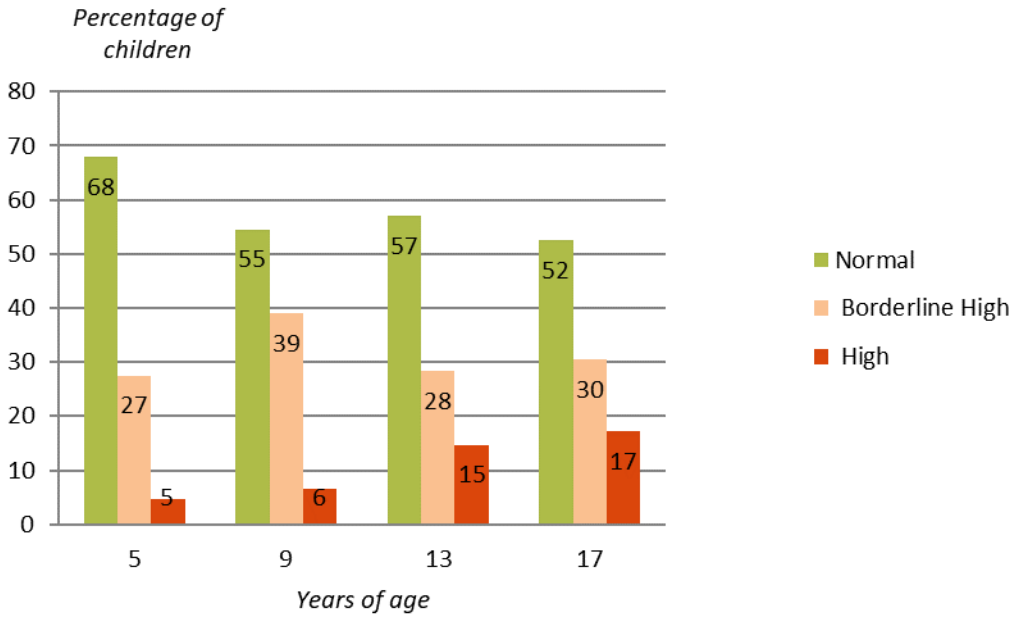

Figure 2. Distribution of children by triglyceride levels in the blood (a total of 740 children).

Pathological levels of total cholesterol and LDL cholesterol were more often recorded in girls while boys had higher triglyceride levels. Obese children had significantly higher blood lipid levels in comparison with normal weight children. Pathological triglyceride levels were found in 28% of obese children and in 10% of normal weight children (Figure 3).

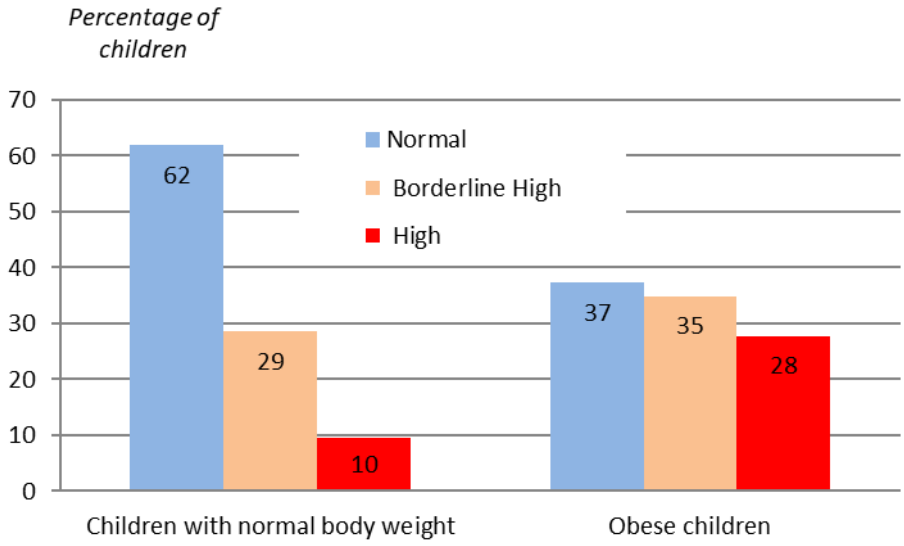

Figure 3. The triglyceride levels in blood by the body weight in children (2016).

3.3 Blood pressure

Blood pressure was measured in all children when presenting for a preventive check-up. It was part of the so-called population screening, with the reading made during a visit to the doctor[1]. Whenever the first reading was higher than the blood pressure values corresponding to the 90th percentile for the given age and gender, the paediatricians were asked to make two more readings (during the ongoing preventive check-up). Blood pressure was evaluated in a subgroup of data obtained by the auscultatory method[2] (in a total of 2,478 children). Based on Guidelines for the diagnosis and treatment of hypertension in children and adolescents (Šamánek et al., 2009), the children were assigned to categories[3]. Ninety percent of children had normal blood pressure, 6% had high-normal blood pressure, and 4% had blood pressure in the hypertension range. The prevalence of high blood pressure or hypertension was slightly increasing with increasing age from 3% in 5-year-olds to 5% in 17-year-olds, but the differences were not statistically significant. Neither were there significant differences between boys and girls. Blood pressure in the range of hypertension was recorded in 3% of normal weight children, 4% of overweight children, but in 15% of obese children (Figure 4).

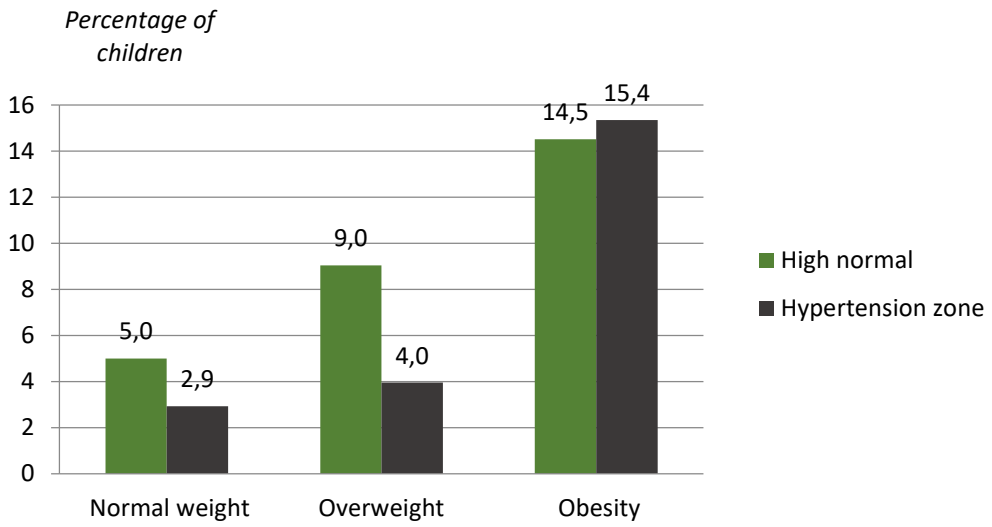

Figure 4. The body weight and elevated blood pressure in children (2016).

[1] To make the diagnosis of hypertension, two more readings are required to be made at two more visits to the doctor.

[2] Blood pressure measuring method using a sphygmomanometer. This is the recommended method (Šamánek & Urbanová, 2014).

[3] Normal blood pressure (until the 90th percentile for the given age, gender, and height), high-normal blood pressure ≥ 90th to 95th percentile, and hypertension corresponding to the value of the 95th percentile or higher. The children were assigned to one of the categories based on the lowest of the readings made.

3.4 Body weight

Body weight assessment in children is made using the percentile Body Mass Index (BMI) charts, which indicate whether a child's weight is proportional to his/her height and age. Based on weight, the children were assigned to four categories[4]. Of the study cohort, 8% of children were underweight, 74% were normal weight, 8% were overweight, and 10% were obese.

Slightly more boys than girls were overweight or obese. The proportion of overweight/obese children was increasing with increasing age (Figure 5, 6): between the ages of five and nine years, the number of overweight/obese children sharply rose, and the highest number of overweight/obese children was among 13-year-olds.

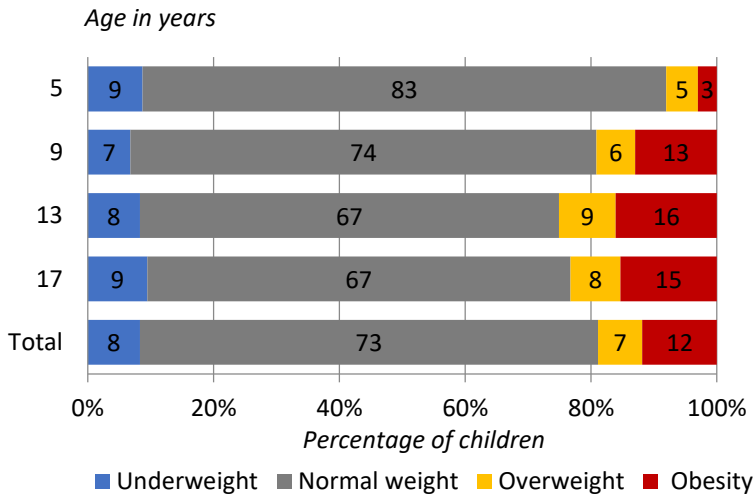

Figure 5. Body weight – Boys (2016).

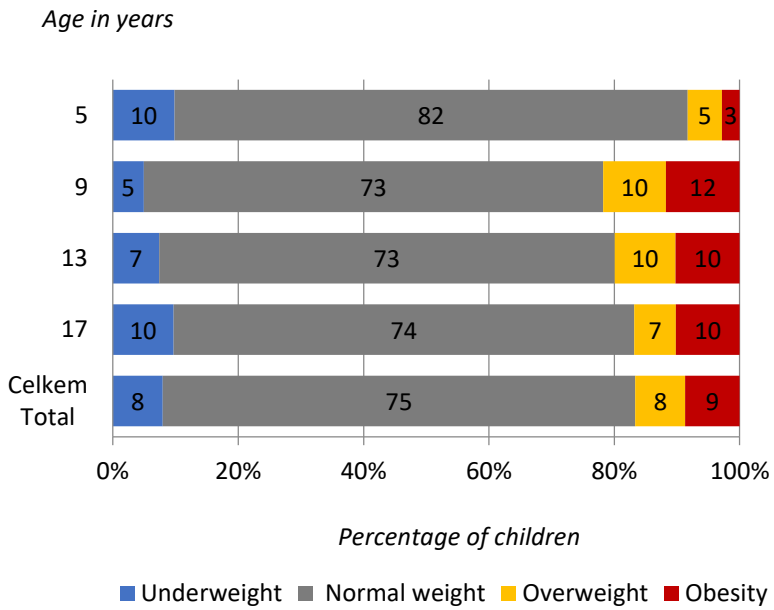

Figure 6. Body weight – Girls (2016).

[4] BMI values below the 10th percentile: underweight, 10th–90th percentile: normal weight, 90th–97th percentile: overweight, above the 97th percentile: obesity.

The trends in body weight in children over the last two decades are shown in Figure 7. Since 1996 when the monitoring started the number of overweight/obese children was increasing until 2011. The results from 2016 show that the upward trend stopped and the number of overweight/obese children tends to be stabilized.

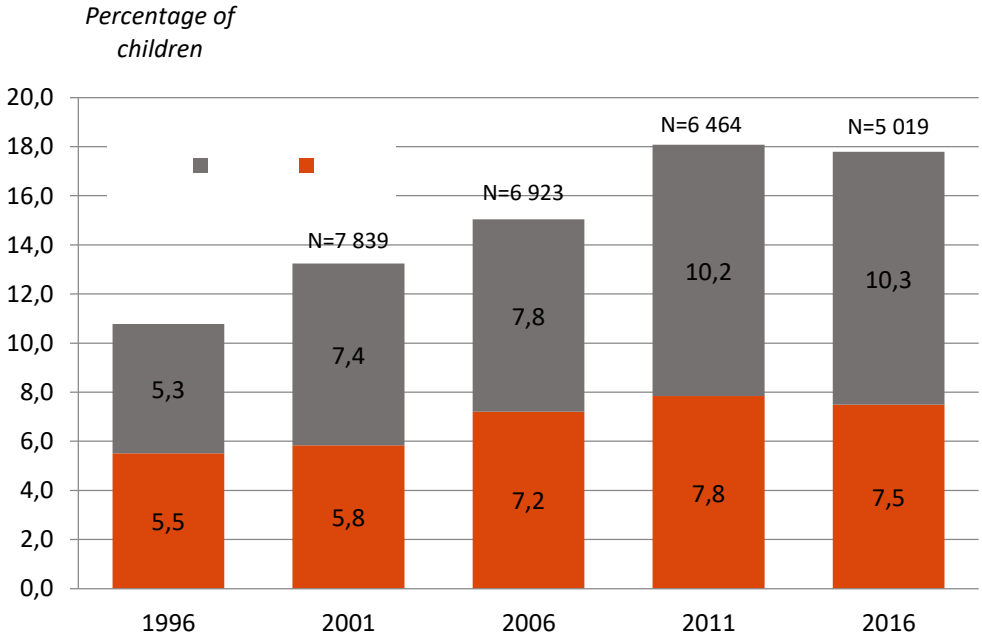

Figure 7. Overweight and obesity in children (1996–2016).

3.5 Locomotor system condition in children

The posture was assessed based on the paediatrician's data on the spine curvature in the sagittal plane, spine curvature in the frontal plane (scoliotic posture and scoliosis), and general posture rated using a 4-point scale. A physiological posture characterized by the physiological spine curvatures in both the sagittal and frontal planes was classified as excellent or good. Children who failed to meet the criteria for physiological posture were diagnosed with postural abnormalities. Such abnormalities were found in 42% of children, more often in boys (46%) than in girls (38%) ($p < 0.001$). The proportion of children with postural abnormalities was increasing with increasing age from 27% in 5-year-olds to 54% in 13-year-olds, but it dropped to 44% in the oldest, 17-year-old children as a result of an increase in muscle mass supporting the skeletal system. Underweight and overweight/obese children had significantly more often postural abnormalities than normal weight children.

The most common postural abnormalities were forward head (26% of children), roundback/thoracic kyphosis (14%), and scoliotic posture (13%). Forward head and roundback were more common in boys, and there was no difference in the prevalence of scoliotic posture between boys and girls. All these three abnormalities were the most common in 13-year-old children. Seventy-nine children (1.5 % of the study cohort) were diagnosed with scoliosis, and the most affected were the 17-year-olds.

3.6 Physical activities and eating habits

Regular organized sports activities are practised by about half of children (54%) participating in sports and leisure groups, with the 9-year-olds being the most active (72%) and the 17-year-olds the least active (37%). The children participating in sports activities spend 3.9 hours per week on average practising sports. The time spent participating in sports activities is increasing with increasing age from two hours per week on average in 5-year-olds to 5.8 hours per week in 17-year-olds. Most children participate in sports activities once to three times per week. No difference was found in the participation in organized sports activities between boys and girls.

Sixty-seven percent of children participate in more or less regular unorganized sports activities at least once a week, with the 9-year-olds accounting for the highest percentage (74%) and the 17-year-olds for the lowest percentage (60%).

Twenty percent of children do not participate in either organized or unorganized sports activities.

Children spend 2.2 hours per day in front of the computer, tablet, or TV on average, ranging from 1.5 hours a day for the 5-year-olds to twice as much time, i.e. 3.2 hours a day for the 17-year-olds. One in four children spends more than three hours a day in front of these electronic devices and one in ten children more than four hours a day. Boys spend significantly more time in front of the PC/TV than girls ($p < 0.001$). Children who spend more than two hours a day in front of the PC/TV have statistically significantly more often forward head ($p = 0.001$), headaches ($p < 0.001$), neck pain ($p < 0.001$), and lower back pain ($p < 0.001$). Children who spend more than two hours a day in front of the PC/TV significantly more often ($p < 0.001$) eat fast food and drink soft drinks and are more often overweight or obese ($p < 0.001$).

Fifteen percent of children eat less than one portion of fruit a day ranging from 10% in 5-year-olds to the double percentage in the 17-year-olds. Even worse outcomes were achieved for eating vegetables: One in four children eats less than one portion of vegetables a day (from 20% of 5-year-olds to 29% of the 17-year-olds). Eleven percent of children drink three or more soft drinks a day; this indicator showed the smallest differences between age categories. Six percent of the 5-year-olds and 20% of the 17-year-olds eat fast food more than once a week. One in ten children eats fast food even twice or three times a week. Overweight/obese children less often eat fruit ($p = 006$) and vegetables ($p = 0.001$), but more often drink soft drinks ($p = 0.016$) and eat fast food ($p < 0.001$) in comparison with normal weight children. Boys eat significantly less fruit and vegetables ($p < 0.001$), drink more soft drinks ($p < 0.001$), and eat more fast food ($p = 0002$) than girls, but the genders did not differ in the consumption of confectionery.

4 Conclusion

The study results show that the increase of allergic diseases prevalence in children has stopped over the last 10 years (2006–2016), nevertheless an allergy is still the most common illness of the child's age when every third child is diagnosed with some type of allergy. A total of 10% children suffer from Asthma. Increased blood pressure at screening examination was found in the same percentage of children.

Altogether 40% of children had a higher than the physiological value of the total cholesterol < 4.4 mmol/l.

Ninety percent of children had normal blood pressure, 6% had high-normal blood pressure, and 4% had blood pressure in the hypertension range.

The prevalence of obesity increased significantly between 1996 and 2011, with the increase stopped in 2016. Obese were 10% of the children, the highest increase in obesity was recorded between 5 and 9 years of age, probably due to school attendance and significant lifestyle changes.

The highest increase in postural abnormalities prevalence was also found among 5 and 9-year-olds. Prevalence of postural abnormalities was 42%.

The study provided compelling information about the children's lifestyle. A total of 20% of children do not engage in any sporting activity; inactivity increased with the age of children. Also the number of hours spent by sitting on computers, tablets, etc. was increasing with the age (on average 5-year-olds 1.5 hours a day, 17-year- olds 3.5 hours a day.) The most important information from the dietary habits evaluation was that a quarter of the children did not have a regular portion of vegetables per day.

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Health as a Social Phenomenon

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Abstract: The present contribution introduces a sociological approach to health. Human health is viewed as a social phenomenon explained by social assumptions. The purpose of the text is to point out the relationship between human health and the society and its values reflected in the lifestyle. An analysis of selected empirical research in the area of values and health documents the difference between the ideal and the real culture, i.e. between what people claim and what they actually live. The results show the need for improvement of the social climate and healthcare literacy for our health is threatened not only by unhealthy food and environment pollution but also by various negative or even pathological phenomena we come across every day in relation to the anomic society.

Key words: health, society, culture, anomie, values, way of life, lifestyle, health literacy

In the present days, based on performance with the objective to stay in the labour market as long as possible, with respect to population ageing and the associated later retirement, while endeavouring economic activities of the seniors, the term of health acquires new dimensions. "Health is worth it", a slogan that has been implemented successfully into a number of marketing strategies to convince you of the necessity to invest in your health and take care of it for a lifetime. The entire creative industry of the today's modern society is involved in creating our needs, i.e. even the need to be "fit", to "feel well", "not to miss any activity", etc. Health is today not only a hot topic but also a big business, and expenses on maintaining our health rise annually. But the ordinary citizen can only hardly separate and identify the social interest from the interest of the pharmaceutical lobby. Health thus becomes a social phenomenon, a social fact in the words of Émile Durkheim (1926) that exists independently of us and exerts pressure on us. Health is a social value where its historical and social conditionality is evident. The concern for public health has always been linked to rational goals: whether in the form of the able-bodied army or economically efficient population. In the modern society, concern for population health is aimed at the funds spent for population morbidity, when the well-designed prevention programmes are able to save considerable sums of money.

1 Objectives and methods

Health will be addressed in the text below on the basis of a sociological approach that allows us to understand the social events and the social phenomena around us. As Peter Berger points out, we are given the opportunity to "see through", "see behind the scene", "see the light", because the "things are not what they seem to be" (Berger, 1991, p. 28). The sociological approach in explaining social phenomena puts a major emphasis on social causes of the social phenomena, and this is just the direction which our attention will be focused on. The issue of health will be incorporated into the social context and considered "sociologically". In this respect, the analytical and comparative method will be applied. The term of health itself, which is the starting point for other considerations, has different connotations and needs to be given more attention.

2 The term of health and who is healthy today?

The medical view of health is most probably best of all addressed in social consciousness. An ill person realizes his or her health at risk more than a healthy person. The so-called presumption of disease[6], based on the belief that diagnosing non-existent illness and eventually treating it is a minor mistake than to neglect a hidden illness, significantly extends control possibilities of the physicians, participates in prevention and has undoubtedly a firm place in health economization, where health is measured by the profit category and by the theory that the invisible hand of the market will solve everything and, what is successful will earn its keep. In the social context, health is often understood the health care sector, but the fundamental process of change and the current state of affairs is reflected aptly as follows:

> Contradiction between advocates of the maximum strict application of the market principles in the health sector and those who prefer consistent understanding of health services as the public services is undoubtedly the main source of tension in the Czech health policy after 1989. The field of health policy is characterized by several basic specific features which convert it into the arena of very sharp political and social confrontations. (Holub & Skovajsa, 2006, p. 119)

Ambiguous term and definition of health is evidenced by its further determination. Constitution of the World Health Organization describes health as a state of "complete mental, physical and social well-being, not just absence of illness or defect" (Holčík, 2012). It is obvious that this is not a definition in the true sense of the word, but rather formulation of the intention, where to go and what to be oriented on in this field (WHO, 2018). By its specification, the World Health Organization demonstrates that it is not focused on illness and health disorder only, but that it is devoted itself to health in its entirety and fullness, in connection with all the health-related circumstances. This specification of health is significant by reminding three basic aspects of health: mental, physical, but also social. Health is an ideal state that, by the definition, does not allow for objective measurement. However, if we proceed from the subjectivist understanding of health, the question is who is actually healthy, i.e. who can say about himself/herself that he/she is in the state of "complete mental, physical and social well-being". This makes the field of research quite unclear as it evokes, in particular from the point of view of the sociology, the questions how to define social health and who is still socially healthy with the growing anomic society? Symptoms of institutional malfunctioning, acting contrary to social norms and values, non-existence and/or malfunctioning of sanctions for breached social standards, including the legal ones, hopeless society perspectives of the society and the disorganization of the personality, suggest that social health is in jeopardy. A Slovak sociologist, Juraj Schenk, speaks about manifestations of the anomic behaviour, which include disruption of institutions, non-prospective development of the uncontrolled society, criminality, uncertainty, distrust, acceptance of amorality, ruthlessness and corruption, recognition of the right to self-preservation at all costs (Schenk, 2004, p. 107–124). It is indisputable that such environment affects the social health, even the health in its entirety, that is to say, mental and physical. Let's return to the definition of health.

Deficiencies in the health definition of 1948 were also acknowledged by WHO, so in 2001, it has supplemented the definition by "reduction of mortality, morbidity and disability as

[6] There is the crucial difference between the criminal law practice, where a bigger mistake is to punish an innocent than not to punish a culprit – *the presumption of innocence*.

a result of identifiable diseases and increase in the perceived level of health" (WHO, 2018). This definition is more realistic than the already mentioned one of 1948, and the included perceived level of health depends to a certain extent on assessment of each individual, on his/her subjective feeling, which opens the possibility to apply the methodological approaches based on the interpretative paradigm with the possibility to be focused on the everyday life of the people.

Health is thus undoubtedly a multidimensional phenomenon. Health is the process that implies not only absence of illness, but the overall sense of well being.

It is just the sense of well being that is associated with the so called therapeutic culture described explicitly by Malgorzata Jacyno (2012). According to the author, from the strategies chosen by the individuals, it is possible to pursue efforts to rationalize their life, with the aim to squeeze as much health, happiness, youth, money and high self-confidence as possible. Full fitness gyms, popularity of work-based training sessions, "brainstorming" and "success programming" courses, workaholism, or tendency to be subject to drastic diets, prove this approach (Jacyno, 2012, p. 7). The therapeutic culture is based on the knowledge of the power over itself, a thorough self-control that is the key to wealth. Just like all the activities leading to being fit permanently and to delay the natural process of ageing as much as possible, to live our story when we have everything in our own hands. This is closely related to the way of life and the lifestyle, creation of the cult of health attacking us everyday from the media as the motto "It's Better to be Wealthy and Healthy than Poor and Ill".

3 Way of life, lifestyle and health

While the way of life is a system of important activities, relationships, life manifestations and customs, a more specific category of lifestyle is manifested in social interactions, in stylization in general, both at the level of an individual or a social group (Kubátová, 2010). In the social groups, we can observe clear tendencies of different lifestyles according to classification in the context of social stratification, in relation to a higher social status, value orientations, etc. There are obvious tendencies not to care very much about health in the groups living at the margins of the society, but in the middle and upper classes of population we can often meet a clear obsession with health.[7] There is an undeniable existence of a relationship between human behaviour and health in the context of everyday life. Different behaviour of the people can be affected by the risk of disease, likelihood of detection, availability of treatment, etc. As stated by the Slovak sociologists, Roman Džambazovič and Daniel Gerbery (2014), health is an important attribute of quality of life and well being, which is understood not only functional but also instrumental value and is of high importance for the person's own identity. It determines who a person actually is. Džambazovič and Gerbery are focused primarily on subjective assessment of one's own health. Their study verifies existence of social inequalities in Slovakia through impact of the socioeconomic status. A low socioeconomic status affects not only subjective assessment of one's own health, but is also an objective category demonstrating inequalities in the health sector. The socioeconomic status is undoubtedly affected by the subjective assessment of health and by presence of a long-term illness, as well as by the so-called health literacy.

[7] It is noticeable, and not only in the U.S., that the number of obese people is far higher in lower social strata than in the higher ones.

4 Health literacy

Health literacy is understood as a set of cognitive and social skills determining motivation and ability of the individuals to obtain access to the health information, to understand and utilize it in a way that develops and maintains health. For the first time in August 2015, the National Institute of Public Health published results of the research of health literacy in the Czech Republic, which results have proved that the level of health literacy drops with age, rises with education, and is restricted by the financial deprivation (ability to pay bills, medicines, medicinal products and doctor visits). According to the report of the National Institute of Public Health, "the Czech Republic is significantly below the average concerning the level of health literacy. Of the eight countries in the European Union, it has taken the seventh place. The Czech Republic lags far behind after the best ones, i.e. the Netherlands, Germany or Poland. Comparing individual health literacy areas, the Czechs were the best in understanding and orientation in the health care sector with 50.6 percent, the worst results were reached in the health promotion sector with only 35.7 percent. The Czechs obtain much easier the information about functioning of the health care system than the information about a healthy lifestyle and strengthening their own health" (Novinky.cz, 2015).

The Czechs are better roughly by four percent than the EU average in understanding the package inserts to the medicines. On the other hand, they are the last but one in searching for information on fat content on the containers, packs, as shown by the Special Eurobarometer 342, 38. Knowledge of the logo associated with health protection is not much more better (Special Eurobarometer 342, p. 46).

5 Health as a value

Sociological approach to health includes not only its interconnection with the value ranking of each individual, but also, in particular, with the so called social values typical for a particular culture in place and time. "The most important social values are, thanks to their significance, confirmed and guaranteed by the legislation and thus also highlighted and fixed in the social consciousness." (Harvánek et al., 2008, p. 83) Health and its protection is included here. To understand values in a particular culture, it is necessary to realize that we distinguish between the ideal cultures, based on the norms and values which are adopted officially by the people, such as values of the Christian civilization, Central European values, etc., and between the real cultures in accordance with which the people act and which are considered acceptable socially (Večeřa & Urbanová, 2011), e.g. we accept monogamous ties, but our culture is full of divorces and marital infidelity. We recognize harmfulness of smoking, drinking alcohol or eating "unhealthy" meals, but we often violate these recommendations. This appreciation of the ideal and real culture is very important for selecting the appropriate methodology for research of values and value orientations. The people are often referred to the values belonging to the sphere of the ideal culture rather than the real culture. (The effort to look better than they really are, and/or to respond in conformity with expectations of the researcher). However, before identifying the place of health in the value rankings, let us remind what the values are and what role do they play.

6 Values

The issue of values concerns interests of many scientific disciplines, whether it be sociology, philosophy, psychology, economics or law. It is not a coincidence that such attention is paid to them. As Milton Rokeach points out, values influence our choice of goals and means

(Nakonečný, 1999, p. 142). When selecting objectives, values appear as the general goals which a person strives for, and/or the sense or price, which an object or event has for a person (e.g. health, family), i.e. the so-called target values. When selecting the means, values appear as the means that we use to achieve something important for us (e.g. education). This sector includes, in particular, moral and personality requirements such as decency, honesty, uprightness, etc., the so called instrumental values. Establishment of values is largely determined socially, which returns us to the previous definition of the relationship of individual social groups to health. Values are a certain standard, individual or cultural (social), through which the things, events, or actions are measured and approved. It is the standard shared by an individual or by a social formation (family, village community, society). The values can thus be related to an individual and his/her personality structure – these are the so called individual values, or to social groups (e.g. to the family) where we talk about group values. If the values are related to a wider human community (religious values) or a certain society (the values of Czech society), then we are speaking about the social values (Večeřa & Urbanová, 2011). Continuous social interactions take place between the individual, group and social levels.

From the sociological point of view, the values belong among the basic elements of the social structure, when the value-related data (especially in longer-term time series) can serve even as predictors of behaviour of the individuals, social groups and social structures. Klyde Kluckhohn appropriately defines the value as explicit or implicit; for an individual or a group, a characteristic feature of the desirable objective that influences the choice of achievable ways, means, and goals of activities (Velký sociologický slovník/The Great Sociological Dictionary, 1996, p. 379). Values are a certain standard, individual or cultural, through which the things, events, or actions are measured and approved. The world of values is not stable, it is changed depending on changes in social reality and development of the axiological experience of the social subjects of everyday life (Večeřa & Urbanová, 2011, p. 130).

7 Health topic in selected empirical research

The value rankings of the Czech population, performed repeatedly, prove that "to be healthy" always takes the first rank. This is supported even by research of individual social groups, such as imprisoned women (Urbanová & Večeřa et al., 2004, p. 119).

But if research of the Czech population uses the terminology like "to live healthy", "to look after one's own health" instead of the health value, the priority of values looks differently. According to the research "Our Society 2014" performed by the Centre for Public Opinion Research of the Institute of Sociology, Academy of Sciences of the Czech Republic, June 2014 (Tuček, 2014), the leading values were as follows: "'to live in a happy family', 'to help my family and friends'. To live healthy, 'to care after one's own health' takes only the 9th place."

Special Eurobarometers are devoted to the topic of health and/or to the related issues, such as the way of life as mentioned above. In 2014, a SPECIAL EUROBAROMETER 412 Sport and Physical Activity REPORT has established that at the European level more than one half of inhabitants is permanently inactive in sports, while 41% of European citizens train or go in for sport at least once a week. The top sport activity can be found among the men in the age group of 15–24, where the active part of the population reaches three quarters compared to women in the same age group who are active in 55% of cases only. Activity of the Europeans drops with age. However, activity of the Czech population is above average at the European level. Compared to the European average (42% of the sport inactive population), in the Czech

Republic only 35% of the population is sport passive, though it should be noted that in 2009 we had only the 33% share of inactive population. In terms of other physical activity, the Czechs with 19% of the population without any physical activity take a better place compared with the 30% European average. On the other hand, the Czechs are in the lead regarding the length of sitting during an average day, 20% of the population sit longer than 8.5 hours a day, the Czech Republic being the fifth most "sedentary" member state. For the Czech sportspeople, their own health is the most common motivation, although in 2009, 53% of the Czech population was motivated that way, and today only 50%. On the contrary, compared to 2009, more Czech sportsmen are motivated by their own physical performance. Despite this fact, such features are more or less the European average. The highest share of the Czech population shows lack of time, 52% in total, as a hindrance for sports. Other frequent reasons include lack of motivation or health barriers.

A number of representative surveys has been devoted to the topic of health in relation to the lifestyle in our country as well. Let us remind the quantitative research Czechs and Health (Češi a zdraví), realized in 2017 by the STEM/Mark Agency, and the project Czechs at a Doctor (Češi u lékaře) realized by the same agency in 2018. Within the scope of the representative investigation (quota selection by gender, age, education, region and place of residence) of January 2017, as many as 510 interviews, focused on eating habits, healthy lifestyle and knowledge of the index-zdravi.cz website, were realized.

In this research, only 5% of people consider their lifestyle healthy, more frequently young people under 30, 23% of respondents think that their lifestyle is rather healthy, 19% consider their lifestyle bad or bad absolutely - men were represented mostly in this group. Poor lifestyle results from lack of time (41% of respondents), lack of money (34%) and poor motivation (26%). 44% of respondents are not engaged in sports, mostly the women and the people at the age of 45–60. 30% go in for sports at least once a week, more likely the respondents at the age of 30–45. In the same research, attention has also been paid to the issues of life improvement and personal well being. 30% of respondents links improvement of life and well being with the financial situation, 12% with good employment and only 10% with health improvement. Another question was focused on search for health information. Nearly 90% of respondents have never heard about the Health Index website – more often men and people over 45 years. Only 1% of respondents knows it and uses it. Other questions are focused on the generally known things that can be heard everywhere, such as the necessity to eat regularly, to have breakfasts and to avoid overeating, which are associated with our culture. The research has revealed that almost half of respondents eat regularly, i.e. they have 3–5 meals a day. Another third has regular meals only a few days a week. The other respondents keep their decision about regular diet for a few days a week, or not at all – more often men over 45 with a lower education. Breakfast is enjoyed by 60% of respondents, mainly women aged 45 and over with a higher education. Another 12% of respondents have breakfast on weekends only, 9% on weekdays only. One fifth of the respondents do not have breakfast at all. Only 17% of the population do not overeat themselves. For the other ones, the main cause of overeating is the feeling or education that everything on the plate has to be eaten, more common in men, and stress elimination is more frequent in women. It is clear, therefore, that education does not bring its results. A better lifestyle with respect to health can be seen in women.

Using the same methodology, the quantitative research was performed by the Stem/Mark Agency in February 2018, i.e. 505 interviews were conducted to find out whether or not the Czechs tell truth to their doctor and to map their interest in health of their loved ones.

Though almost all respondents think that the physicians need to know the whole truth about their health for purpose of the right diagnosis, one third of them admits that they have

sometimes concealed some reality about their health. Typically, because they were ashamed or did not consider the problem so serious. More than half of Czechs usually tell their doctor only what they consider essential.

Less than one fifth of the respondents also correct the truth about their lifestyle (smoking, drinking alcohol, sports, weight), if need be.

In general, older people (60+) are more honest and fair with the doctor, which is most probably related to a greater confidence they have with their physician. Young people under the age of 30 are often ashamed with the doctor and have therefore a greater problem to tell him everything.

The majority of Czechs declare their interest in health of their loved ones. It is true that 9 out of 10 respondents speak with their loved ones at least sometimes about their state of health. It is characteristic that this topic must be raised by the other person whose health is concerned. The Czechs talk about their own health less frequently, and most often only when they are asked about it.

More than half of the respondents have ever experienced or had the feeling that their loved ones do not say the whole truth about their health. The person most often did not consider his/her problem important. However, when it comes to the health of others, the people are more rigorous in assessing individual symptoms – a close person would be sent to a doctor with a certain symptom more often than should the same symptoms be revealed by themselves.

When health problems are revealed in a close relative, three quarters of the Czechs would suggest a visit to the physician. The most potent reasons for examination are as follows: excessive heart palpitations, shortness of breath and swelling of the legs.

8 Conclusion

We have tried to incorporate the topic of health into the social context. Health is related not only to social values but to the whole social climate. Our health is endangered not only by unsuitable food and environmental pollution, but also by the negative or pathological phenomena which are encountered every day and associated with the anomic society. We are aware of the importance of health within the ideal culture, but in the real culture we often commit various kinds of transgressions, even in case of the perfectly known things, such as to look after one's own health.

The social challenge is to increase health literacy, and for this purpose it is necessary to involve the control systems, whether these are different institutions, family, neighbourhood, civil society activities, or upbringing and education. It is impossible to expect validity of classic economic axioms, claiming that each of us rationally assesses benefit and value of all assets and possessions and decides accordingly. To the effect of the behavioural economics, it is rather necessary to consider our irrationality, which can be misused easily, especially when it comes to such an important social value as health.

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A Program of Health-Education Intervention as a Health-Oriented Strategy of Romany Children Education

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Abstract: The paper discusses the reasons for various negative indicators of health and life-style of the Romany minority. Special attention is paid to Romany students attending a primary school. Based on the acquired empirical and research data we emphasize educational opportunities of the program of health-education intervention. The program introduces an educational strategy pursuing the support of cognitive and other abilities and predispositions of Romany students with regard to health. The paper highlights the motivating and innovative potential of pro-health intervention programs that contribute to a positive development of the cognitive and emotional life of Romany students.

Key words: health, Romany student, program of health-education intervention

The psycho-socially and culturally determined differences in the life-style and behaviour of Romany children and youth stem from historically determined and still persisting stereotypes. Their life-style is characterized by inappropriate dietary habits, consumption of cheap alcohol, heavy smoking, insufficient personal and community hygiene, low accommodation standards, environmental pollution, insufficient or one-sided physical activities, and poor knowledge of the preventive healthcare. This is predetermined by an approach to education by the Romany family and community. It usually lacks effectiveness and is sometimes even dysfunctional, especially in relation to the generally acknowledged pro-health standards. This is reflected in maladaptation in the intellectual, emotional and social areas and in unsuccessful social integration, the lack of responsibility for one's behaviour, one's future, and in the persisting socio-cultural resistance to the majority community.

A special life-style problem of Romanies bears on the high frequency of socio-pathological phenomena as well as adverse health parameters. Our knowledge is mostly based on local reality (e.g. Liba, 2018). The validity and relevance of some information and data obtained from Romanies is doubtful due to the fact that it reflects their tendency to say what is expected from them, what is only half-true, or even to make things up. This makes serious co-operation problematic. Another factor limiting the possibility to obtain reliable information and data is the existence of antidiscrimination regulations that preclude us from obtaining precise statistical data on the health condition of the Romany population. As a result, there is no objective information about the number and the structure of the Romany population, their reproduction characteristics, about the situation and the tendencies in their morbidity, mortality, fertility and migration. All the data is based on partial community polls and estimates. Consequently, a permanent task of the participating institutions must consist in the implementation and subsequent evaluation of continuous and systematic measures that are aimed at the improvement of the health condition of the Romany population in general.

The psycho-socially and culturally determined differences in the informative and formative influence of a Romany family is projected onto the behaviour of Romany children and youth. This is manifested in their insufficient intellectual, emotional and psycho-social stimulation and, consequently, in a social-education deficit that limits the opportunities for their comprehensive social inclusion (PRINED, 2015). If we admit the dominant position of family education it is necessary to emphasize the responsibility of the other educational

participants, primarily the school. It plays an indispensable role in the intentional and systematic development of attitudes and values pertaining to responsible behaviour. What is needed is the reference frame pursuing the development of the desired cognitive, socio-emotional and psycho-motor abilities and skills. The contents and the overall process of school education of Romany children to health should reflect their idiosyncrasies, overcome the existing prejudices, activate cognitive abilities and establish a supporting educational environment.

Former failures to fulfil the formulated objectives necessitate a well-considered and systematic empirical research analysis of the reasons for the persisting dysfunction of the majority of education strategies and approaches. Consequently, it is important to establish, implement and evaluate motivating and innovative strategies targeted at the participation and cooperation of Romany children. Education is the determining factor in solving numerous problems of Romanies, including their poor health parameters and social pathology. Given a different starting point of Romany students the school must seek, implement and analyse the efficiency of educational approaches that activate cognitive abilities and support emotional and value-oriented development.

Given this situation and the crucial role of the school in the overall system of education to health, this paper discusses the educational possibilities of health-education intervention programmes in the process of positive development of intellectual, emotional and motor qualities of Romany children. This form of education makes it possible to overcome the established educational stereotypes, to interconnect educational objectives and methodological procedures with individualized requirements and abilities of Romany students, to take into consideration the specific conditions of each school and local idiosyncrasies, and to make use of all sorts of interaction between a teacher and Romany students. Much attention should also be paid to informal cooperation with Romany families.

Our research indicates a comprehensive and positive influence of health-education intervention programs upon the classroom life thanks to a non-frustrating atmosphere and a sufficient time space allocated to the identification of correct solutions and procedures. All this gives support to student's activities and to the role of a teacher as an advisor and motivator. Programs of health-educational intervention bridge and interrelate various forms, methods and means of education through tuition presentations, games, motion activities, dramatization, drawing and painting, singing, puzzles, fairy tales and stories as well as tests and an appropriate educational software.

The program of health-educational intervention may be illustrated with one specific case. Its implementation and evaluation demonstrate its adequacy, applicability, visual quality, support of independent thinking and positive motivation of Romany students with regard to health. The program was implemented in nine meetings per two hours. The program included several established education procedures (tuition presentations, games, songs, etc.). Three meetings employed interactive teaching by means of an interactive board. The program covered six thematic areas facilitating and supporting an individualized approach, better concentration, perception, precision, verbal activities, and increase of word-stock. Furthermore, it stimulated affective-motivation structures and the cognitive capacity of Romany students.

1 Program of health-educational intervention

The program contributed to the development of the *cognitive* competence as well as *individual, social and community competences* of Romany students. The *cognitive competence* pursues the development of perception, imagination and memory. Romany students improved their skills of problem categorization, generalization, classification and solution. They developed their learning competence, e.g., search for and classification of the information concerning an active support of health protection; in cooperation with a teacher they evaluated the information and related it to their knowledge, and formulated conclusions for themselves and for the whole group. The *individual competence* means self-development in terms of self-consciousness, self-knowledge, self-assessment, self-control, self-confidence, self-respect, self-education and emphatic feeling. The *social competence* concerns the behaviour appropriate to their immediate social relations and appropriate social behaviour in various social areas and situations. The students acquired the basic tenets of expressing recognition, relevant criticism and rejection. They acquired the basic principles of pro-social behaviour, of establishing relationships to their social environment and of cultivated relationships to other people. The objective of the *communicative competence* consists in the ability to apply the acquired communication skills at school, and to apply the acquired communication models of behaviour for the prevention of socio-pathological phenomena. In addition, the students learned how to reproduce the contents of a text (Liba & Taišová, 2013).

1.1 Specific program objectives

- learning of and adhering to the basic hygienic routines – individual and community hygiene;
- learning of and adhering to the principles of healthy diet;
- learning of the human body functions;
- awareness of the value of health and of disadvantages of a bad health condition and of diseases;
- understanding of the negative drug effects (alcohol, tobacco, solutions);
- development of self-respect and understanding one's own value;
- support of the experiences of happiness that result from one's own success and from the success of schoolmates – activities pursuing the relief of tension and supporting one's concentration;
- support of cooperative behaviour in joint activities;
- establishment of the necessary preconditions for a positive attitude to systematic motion activities and sports;
- development of critical thinking in justifying the significance and the value of healthy life-style.

1.2 Forms and methods of program implementation

The program structure was as follows: introduction, main activity, conclusion. The introduction included warm-up and motivation activities of students (e.g., motion games, songs, brainstorming). The main activity was based on a specific topic and the related

activities – learning through experiences. These included situational methods, role-plays, games, motivation fairy-tales, creative scenical role-plays, competition, relaxation through music and text, controlled discussions on selected topics, and team work. The conclusion summarized and evaluated the activities and the main ideas, and appreciated active work and cooperation…

Three education activities (sessions) employed an interactive board. A system that included a white-board, a computer, a digital data projector, and an eBeam set employed information-communication technologies for establishing an interactive digital workplace in a classroom. This workplace increased the efficiency of the tuition process and enabled the Romany students to work in a creative and interactive way. A combination of image, video, sound and text increased the efficiency of the education process and made the students' work more attractive. Rich experiences contributed to the development of the emotional and creative facet of the personality of the Romany students. The structure and the contents of the activities drew on the thematic areas of the health-educational intervention program.

1.3 Thematic areas

Theme 1: My body in the country of health

Objective: Understanding and naming various parts of human body, developing elementary knowledge of some internal organs and their functions in the human body (lungs, heart, stomach). Positive perception and acceptation of one's body. Awareness of the unique nature of one's personality.

Theme 2: Sick Ferko

Objective: Understanding the notion of health, specification of the health factors. Awareness of one's experiencing the health and illness. Knowledge of both health dangers and health strengthening factors – significance of appropriate and regular motion activities. Significance of health in individual stages of human life. Understanding the value of health. Ability to protect one's health in terms of safety (calling a doctor, fire alarm).

Theme 3: Magical world of hygiene

Objective: Acquisition of fundamental hygiene habits, maintenance of a clean home and environment. Importance of hygiene in human life. Danger of infectious diseases, such as jaundice. Responsibility for one's decision-making.

Theme 4: Plate full of health

Objective: Knowledge and development of a positive attitude to correct dietary habits. Significance of consuming healthy food. Knowledge of the basic hygiene rules and of storing essential foodstuff. Risks of incorrect nutrition in relation to diseases.

Theme 5: Free time without smoking

Objective: Risks and negative consequences of smoking upon human body and health. Effective and meaningful free time activities. Development of the fundamental skills and abilities, such as initiative, communication, respect, friendship, patience.

Theme 6: Our enemy alcohol

Objective: Negative effects of alcohol consumption upon human health. Ability to reject an offered alcoholic drink. Development of concentration, attention and the ability to relax.

An empirical and statistical analysis and evaluation of the obtained data enabled us to conclude that the implemented health-education intervention program positively affected the classroom atmosphere. It was manifested in better interpersonal relations among students and in their satisfaction in a classroom. The students did not feel tired; instead of responding to problem situations emotionally (cry, anger) they preferred communication and advice. The team-work was characterized by a higher student activity and interest in their work. The program promoted self-control and respect for schoolmates. The students realized the harmful effects of alcohol and tobacco and were able to specify the principles of the non-consumerist behaviour. The program of health-education intervention unambiguously improved cognitive parameters (knowledge) of the Romany students in the specific area of research.

Our experiences suggest that the success of complementary educational strategies and approaches is primarily determined by the teacher's competence. The competence profile of a teacher must therefore integrate the ability to transform the available opportunities, options and recommendations (e.g., inclusive education, IT, program development, problem-solving techniques) to practical education. This is a challenge to the structure and contents of the undergraduate training of future primary school teachers.

2 Conclusion

The health-education intervention program pursues the objective of a positive change in cognitive parameters, behaviour and classroom atmosphere at primary schools attended by Romany children. The research into education effects did not extend over a longer time period. Our intention was to design and verify an educational form (approach, strategy), both motivating and innovative in its relation to the systematic integration of education to health into the education of Romany students.

The education measures concerning the preventive health-care find their application in school education which, owing to its quantity and quality, guarantees a systematic and effective intervention into the structure and the contents of the life-style of Romany children and youth. The program of health-education intervention takes into consideration the idiosyncrasies of Romany students and interrelates general pro-health objectives, tasks and education principles with specific methodological procedures in order to enhance potential abilities of Romany students (Liba, 2016).

The health-education intervention program made it possible to implement precise and comprehensible instructions for proper communication, its monitoring and analysis, and for an evaluation of results. This program stimulated cognitive functions and affective-motivation structures, it facilitated socialization and individualization, and contributed to the education of Romany students.

While taking into consideration these observations it should be borne in mind that no single educational strategy can be reliably and permanently applied to Romany students. However, an erudite and, at the same time, sensitive adjustment of motivation stimuli can streamline the process of education to health and thus contribute to an effective solution of the existing education problems of Romany students.

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Exam Phobia and Its Therapy

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Abstract: One of the stressful situations in the life of a college student are tests which successful passing is a condition of studying at the university. Testing as a stressor is of varying intensity, and in some students it may have the character of a exam phobia, which is a special form of social phobia. In our paper we focused on the diagnosis and therapy of the exam phobia at the students of FPE ZCU in Pilsen, who were clients of a university counseling center for three years due to the intense experience of unwanted psychic conditions before and during the exam.

Based on clinical and test methods, these patients were diagnosed by the diagnostics focused on degree and etiology of experiencing the test as a stressful situation and the appropriate form of therapy was chosen. After graduation, the success of the therapy was verified on the basis of a repeated projective test.

Key words: exam fobia, social fobia, diagnostics, therapy, projection

One of stressful situations in the life of a university student is the oral exam. Its passing is one of the conditions of a university student life. The exam is one of the form of checking students' knowledge and skills. At the same time, it is a feedback to how the teachers run their lessons and their ability to get students ready for the exam.

Experiencing the exam as a stressful situation has a different intensity, some students may have the character of the exam phobia. These are manifested by exam failures or psychosomatic problems during the exam situation. In our research, we focused on diagnostics and therapy of the phobia of West Bohemia University students, who were clients of a university counseling center for 3 years because of the intense experience of unwanted mental states before and after test. Psychological investigation and follow-up psychotherapy during the counseling activity took place in years 2015 to 2018.

1 Theoretical basis

The exam phobia is a special kind of social phobia that is defined as "the fear of any kind of social situation especially when a student is exposed to evaluation by others" (Hartl & Hartlová, 2010, p. 156). According to MKCH-10 this social phobia belongs to phobic-anxiety neurotic disorders.

Pogady and Guensberger (1987), Hartl and Hartlová (2010), Miňhová and Lovasová (2018) define phobia as unreasonable, nonsensical, which has its own object. It is a compulsive fear that enforces against the will of man and cannot be suppressed. In its overwork, the feeling of tension increases and different vegetative reactions occur. The subject of compulsive fear may be various things and situations, the most frequent form of phobia is anthropophobia and social phobia (Miňhová & Lovasová, 2018). Its most frequent manifestations are the fear of being mocked, the fear of being the center of attention, the fear of speaking to the public, the fear of speaking to authority. The text says that even the exam phobia obviously belongs to this field. The text says that even the exam phobia obviously belongs to this field. The

symptoms of social phobia can be physiological (heart pounding, sweating, rapid heartbeat, redness, muscle tension, etc.), psychic ("they'll mock me", "I'll get embarrassed" and other paranoid thoughts) and behavioral (speechlessness, trembling, tics, etc.).

The intensity of experiencing unwanted mental states before and during the exam is the result of a number of objective and subjective factors (Lovasová, 2017; Miňhová & Lovasová, 2018).

Some objective factors that do not depend on the personality of the student are the number of exams in the semester, their difficulty in relation to the scope of instruction prescribed by the curriculum, the number of students in lessons, the form of the exam, available literature, the type of study and the field of study and of course the approach and behavior of the examiner.

Among subjective factors we can name students' personal and social anamnesis and students' personal skills and abilities.

The most important inner factor influencing experiencing and regulation of pre-exam states, we consider stability and balance of personality. The researches have proven that students perceive the exam always or usually as a load, but the degree of this experience is different.

Based on exam and clinical methods, a diagnosis focused on the intensity and etiology of the exam phobia was performed and thus the appropriate form of psychotherapy was chosen.

Authors (Miňhová & Lovasová, 2018) say that in calm and emotionally balanced personalities, a mobilization of forces dominates in stressful situations, in unstable individuals with elevated neuroticism is on the contrary a tendency to demobilization activities and psychological failures. In our research, we come from Eysenck's concept of neuroticism as a disposition to neurotic disorders. The relationship between neuroticism and neurotic disorder is a complex problem with no unity of opinion. As Miňhová and Lovasová (2018, p. 128–129) state, "some authors, eg Engelsmann (1969), do not make the difference between these terms". Eysenck (1967, 1993) describes the term neuroticism as a general tendency to neurotic disorders, which he defines as functional nervous system disorder. We encounter the term neuroticism also in Rican (2010). He sees psychophysiological basis of neuroticism at high reactivity of the autonomic system, which controls various functions of the body, and is closely related to emotions (Miňhová & Lovasová, 2018). Current authors include Vágnerová (2004, p. 105), consider neuroticism as "a tendency to fear and depressing tuning".

There is a discrepancy in approaches to a definition of the term "neurotic disorder". From the newer authors, we give the definition of Hartl and Hartlová (2010, p. 346): "Neurotic disorder is a functional reversible disease without psychogenic disorder, with well-established disease outlook." Vagnerová (2014) states that neurotic disorder is manifested mainly by adaptive problems and insufficient self-concept of an individual. This theoretical starting point can be concluded by saying that neuroticism, which may or may not result in a neurotic disorder is, due to its tendency to increased emotional lability, the disposition factor of the test phobia.

2 Diagnostic investigation and therapeutic treatment of clients

2.1 The aim of psychological investigation

The aim of the psychological investigation is to diagnose the intensity of the experience and etiology of the exam phobia and to select an adequate form of therapy on its basis.

2.2 Respondents' characteristics

As respondents we chose the students of years one, two and three of bachelor study "specialization in pedagogy" and students of years one and two of master study. The sample examined consisted of 324 students, of whom 216 studied a Bachelor's degree program and 108 Master's degree programs. The total number of students consisted of 106 men and 2018 women. The predominance of women is on one side given by the representation of women at the faculty of education, on the other side it is another kind of gender mentality of women and their tendency to confide their problems.

2.3 Methods

We used both exam and clinical methods to determine the diagnosis. The exam methods were mainly focused on the issue of neuroticism, which we consider to be the basic disposition factor of the exam phobia.

In our research, we come out of Eysenck's concept of neuroticism as a disposition to neurotic disorders, whose symptoms include various phobias and anxiety. Eysenck's neuroticism is manifested by emotional instability, increased readiness to anxiety, and increased sensitivity to some interactions.

We used *Eysenck's personality questionnaire* to determine the degree of neuroticism.

A Neurotic Symptom Inventory was used to specify neurotic symptomatology.

The degree of current anxiety was measured by a questionnaire of the Scale of *Classical Social Situational Anxiety and Truth*, and the *Baltrusch Projective Balance Exam* "Human Character Drawing".

Exam methods were supplemented by clinical methods (interview and questionnaire of their own design). At the beginning of the exam, we used an uncontrolled interview that we applied at the first consultation to get in touch with the client and gain his trust. It followed up with a controlled conversation, the purpose of which was to determine the degree of experiencing the test as a stressful situation.

Part of the examination was also a questionnaire of its own construction focused on some of the anamnestic data of the investigated persons and a semi-structured interview in order to find the attitudes of the students to the exam, the way and the length of their preparation for the exam.

2.4 Results

Exam as a stresful situation for students

On the basis of a controlled interview, we tried to find out if our counseling clients were always experiencing a stressful situation or just sometimes, or never (Table 1).

Table 1

Exam as a stressful situation for students

The exam is a burden for me	Examined file	%
Always	310	95.7
Usually	14	4.3
Sometimes	0	0
Never	0	0

It is clear from the table that students mostly answer that the test is always a stressful situation for our them. Out of the total number of clients, only 14 responded that the test was usually a stressful situation for them. None of the clients said that the test had never been or sometimes was not a stressful situation. These answers were supposed to be said due to the fact that the test-strain experienced was the cause of their visit to a university counseling center.

Research of the etiology of the exam phobia

Based on a testicular examination (Eysenck's personality questionnaire), we tried to find out if our clients were experiencing increased neuroticism, which, according to current research, is considered to be the most important internal factor of the exam phobia.

The following table (Table 2) shows the number of students that experience abnormal distress prior to the exam as a consequence of increased neuroticism.

Table 2

Neuroticism among respondents

Students total number	Neurotic students		Stabil students	
	Absolute number	%	Absolute number	%
324	266	82.1	58	17.9

The table shows that out of 324 respondents, 266 (82.1%) proved an increased neuroticism, while 58 (17.9%) didn't prove increased neuroticism as a disposition factor.

We were wondering if there would be a statistically significant difference between the number of neurotic students in Bachelor's and Master's studies (Table 3).

Table 3

Neuroticism among Bachelor's and Master's students

Form of study	Number of examined students	Neurotic students	
		Absolute number	%
Bachelor study	216	182	84.2
Master study	108	84	77.7

Based on the research we come to the result that the difference between the number of Bachelor and Master students is not statistically significant. A somewhat higher number of unstable bachelor students may be due to less experience with exams and greater variety of subjects.

The following table shows the difference between the number of neurotic men and women of our research (Table 4).

Table 4

Representation of neuroticism by sex

Gender of study	Total number	Neurotic students	
		Absolut number	%
Men	106	82	77.4
Women	218	184	84.4
Together	324	266	82.1

The table says that the difference between the percentage of neurotic male students and neurotic female students is not statistically significant. Slightly increased number of female students can be caused by general women emotionality.

Symptomatology of neuroticism of students

Using a neuroscience inventory and the KSAT exam, we have come to the conclusion that in students with a higher degree of neuroscience, predominantly anxiously phobic symptomatology prevails.

Based on the KSAT exam, we find out that socially-staying anxiety is on first place in the overall score, and second place is the stage-fright. Only third place in the order is fear, bound to situations threatening the biological existence of man. This fact can be explained by the fact that the emotional life of a college student is determined by socio-psychological needs rather than biological ones.

The questionnaire survey was supplemented by a projective examination, by Baltrusch's drawing exam. In this exam, the markers of increased anxiety and decreased self-esteem (a small figure placed on the underside of the paper or on its edge, insufficient joining of individual parts of the body, asymmetric or strikingly small head) appeared. This may be a reflection of emotional lability, anxiety, lower self-confidence, and adaptive difficulties.

From the data above, we can see that 58 (17.9%) students didn't prove increased neuroticism as a disposition factor. So, we were looking for some other cause of exam phobia. We used anamnestic questionnaire and structured interview.

The cause of the intensely experienced distress in connection with the exam may be the *factors resulting from the personality and social history of the students and their attitudes to study.*

These are the following factors:

- primary family problems (parent's divorce, care of a sick family member, emotional extortion by parents or younger siblings);
- stay abroad (a problem with recognition of some exam carried out abroad, time stress due to big number of exams);
- employed students (time stress of "working students" – these students often experience stress because they do not have enough space to attend seminars and exercises and spend the necessary time to prepare for the exam);
- insufficient preparation for exam/exams (underestimating the difficulty of exams);
- procrastination;
- Erasmus or Free movers abroad (problems with recognition of some tests abroad, related time stress due to accumulation of tests);
- bringing up their own child (females are often frustrated due to partial isolation in the study group, lack of opportunity to participate in teaching). Fathers usually do not meet the exam phobia, which can be explained by the different prescription and performance of male and female roles.

3 Exam phobia psychotherapy

Based on the client's personality diagnostics, we chose the indicated form of psychotherapy. Its goal was to get rid students of the crippling fear of the exam.

Cognitive behavior therapy

We performed this form of therapy for all clients, especially for those who did not show an increased degree of neuroticism in the exam.

This therapy consists in analyzing their preparation for the exam and in supporting their confidence in their own abilities. With students, we tried to discuss how much time they needed to prepare for the exam, we lead them to respect for their type of memory and imagination in relation to learning. We cultivate the need for serious preparation for the exam in students, thereby increasing the feeling of certainty and adequate self-image. we cultivated a feeling of serious preparation for the exam.

This form of therapy consists of the following steps:

- we teach students to express their fears verbally;
- to clarify what fears are coming from;
- find information that can reassure the student;
- focus on the previous positive experience;
- imagine a nice feeling after a successful exam.

Targeted desensitization of pre-test and test experience

In the form of psychodrama, we introduced students to the exam situation (one student played an examiner, the other a tried student). Then, of course, there was a role change.

Suggestive psychotherapy

Based on hypnoanalysis, we revealed traumas displaced by consciousness and various compliances and frustrations suppressed in the subconscious. These traumas can be the source of their anxiety on the basis of increased neuroticism. By the form of posthypnotic suggestion, we tried to get these subconscious motives under conscious control.

With hypnotherapy, we were influencing students' consciousness, building trust in their abilities and tried to make them get rid of anxiety and fear.

At the same time, we taught students how to use positive suggestions to program the subconscious (immediately before falling asleep and immediately after awakening they repeatedly say the phrase: "When I go on the exam, I'll be calm and apply everything I have learned.").

Relaxation exercises

These techniques are focused on current mental state regulation including anxiety. The sense of relaxation exercises is not just to relax and to refrain from inner tension, but also to learn an effective from of defense against stress. Relaxation techniques have their diagnostic and therapeutical aspect, which intertwine each other. With students we were doing relaxation exercises to relax their nervous tension and relieve their anxiety and exam phobias.

We used the following relaxation exercises:

- controlled and uncontrolled breathing;
- antistress massage;
- Jacobson progressive relaxation;
- Schulz autogenous training;
- visualization and imagination (taking bath in cleaning brook, a meadow with magical grandpa, etc.).

The culmination of imaginative techniques is a "safety spot" where participants can drop everything that is heavy, get rid of anxieties and induce a sense of security and security. Some

students get into the "safety spot" easily, some with repeated imagination. At the end of each technique, we analyzed the student's current feelings.

After completing the psychotherapy, we re-enrolled the Baltrusch exam and found that the typical neurotic and anxiety phenomena were significantly diminished in the drawing.

In our research we have come to a conclusion that students' self-reflection by using hypnoanalysis and psychotherapy by using relaxation techniques are very effective.

4 Discussion and Conclusion

The relationship between neuroticism and the current physiological responses in a psychological burden situation, including a university exam, has been under investigation for several decades. Conclusions of some researches (Chida & Hamr, 2008), indicate that the level of neuroticism is related to heart rate reactivity and blood pressure change. Some authors (Norris, Larsen, & Cacioppo, 2007) were focusing on the relationship between neuroticism and reactivity of skin conduction in the presence of emotionally tuned images. A number of research (Höschl, Libiger, & Švestka, 2004; Lovasová, 2017) suggests that individuals with a higher degree of neuroticism are characterized by inequality and unstable emotionality characterized by strong excitement and hypersensitivity. The emotions of these people are heavily experienced, often inversely proportional to the force of impulses (Nakonečný, 2011). In the context of a mood, negative emotional tunes prevail (Lovasová, 2017).

The research NCS – R (National Comorbidity Survey Replication), that was run between 2001–2003, says that social phobia is second most common anxiety disorder (Valentin, 2018). This solution correlates with the results of research in the Czech Republic (Höschl et al., 2004; Miňhová, 2006; Lovasová, 2017; Miňhová & Lovasová, 2018;).

The above research results correspond to the results of our survey, as these characteristics are the nutrient soil for the development of the exam phobia.

The results of the diagnostic research and therapeutic treatment entitle us to a conclusion that the intensity of the exam/ exam as a stressor depends on many objective and subjective factors. At the department of Psychology of the Faculty of Education of West Bohemian University, we try to help students to reduce the intensity of experiencing exam/ exam as a stressful situation to a tolerable rate, which would be rather mobilizing than paralyzing. In this sense, we try to help students by the appropriately chosen therapy.

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Short Interventions as a Means of Increasing Patient Health Literacy

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Abstract: The strategic document released by the government of the Czech Republic "Health 2020" – National Health Protection and Support Strategy and Disease Prevention is aimed to start effective and long-term sustainable mechanisms to improve medical condition of the population. For the fulfilment of this strategy were 13 action plans processed, including concrete aims, responsibility, indicators and performance dates for key priority issues in the field of the support of public health. The action plan No 12 *Development of the health literacy* is devoted to the increase of health literacy of target population groups. A subsidy scheme of the Ministry of Health "National Health Programme – Health Support Projects" is intended to support action plans activities and tasks.

Improving health literacy leading to the elimination or diminishing risk factors resulting from the lifestyle of intervened participants and strengthening their responsibility for their own health is the aim of the short interventions recommended by WHO as an effective and inexpensive education method. The level of risk of the chosen lifestyle impacting the patient's health is measured by standardized WHO questionnaires for the addiction field and NIPH (the National Institute of Public Health) questionnaires for the nutrition and physical activity. After the performed intervention its effectiveness is evaluated, that means level of influencing behaviour and attitude of the intervened person by means of a short questionnaire. Activities aimed at increasing the health literacy of target population groups are supported from the subsidy programme of the public health protection and support of the Ministry of Health of the Czech Republic.

A project of the Medical College Prague dealing with short interventions about lifestyle risks of in-patients as well as out-patients in health centres and hospitals in the whole Czech Republic, where bachelor students of the Medical College Prague perform their traineeship or students in distance learning have been already working was financially supported 2016–2017. Students were trained in the method of short intervention using a set of 24 education cards created by the National Institute of Public Health. Interventions were performed in outpatient and inpatient wards of health-care facilities throughout the Czech Republic from 1 January 2016 till 31 December 2017. The level of risk of the chosen lifestyle impacting the patient's health was measured by standardized WHO (FTQ and AUDIT) questionnaires for the addiction field and NIPH questionnaires for the nutrition and physical activity and knowledge about influenza vaccination (NIPH and Medical College questionnaires). After the performed intervention its effectiveness was evaluated, that means the level of influencing behaviour and attitude of the intervened person by means of a short questionnaire. All data found in the course of the questionnaire inquire were transformed into electronic data, then analysed and evaluated.

In the implementation framework of this 2-year-project 3,905 patients in total from 63 health facilities were intervened with 6,365 and intervened 5,890 lifestyle risk factors. The most

patients were educated on various wards in the General University Hospital in Prague which Medical College has a very good log-term collaboration with. Intervention effectiveness in the implemented project framework was evaluated on the basis of a short questionnaire inquire performed after the intervention. As a whole, 45.7% intervened patients stated their intention to increase their physical activity resulting from the performed intervention, 49% stated their intention to reduce smoking, 18.1% decided to break their smoking habit and 13.8% considered visiting a centre for smoking cessation. As a result of the intervention, 43.8% patients made a decision about cutting down on alcohol. 48.7% intervened participants decided to adjust their unhealthy diet. The intervention was regarded as an intrusion into the privacy mostly in the alcohol consumption field (23.8%). The project implementation by the Medical College contributes to fulfilment of national action plans and the strategy Health 2020.

In the frame of implementation of this 2-year-project almost 4,000 participants were educated. The medical environment of interventions makes a significant contribution to the method success. The project implementation through the Medical College Prague was very appreciated by the Ministry of Health and the Medical College Prague contributed with this project to the fulfilment of national action plans that were approved by the government of the Czech Republic, in particular AP 12 *Development of the health literacy*.

Key words: individual interventions, method of brief intervention, health literacy, strategy of health support, the role of health care professionals in the support of public health

The strategic document Health 2020 – National Health Protection and Support Strategy and Disease Prevention is a framework summary for the public health development in the Czech Republic and a tool for the WHO programme Health 2020 implementation approved by the 62nd meeting of the WHO Regional committee for Europe in September 2012. The aim of the National strategy is above all the stabilisation of the support strategy and disease prevention system and launching effective and long-term mechanisms leading to the improvement of the medical condition of the population. The strategy processes the public health vision as a dynamic mesh of interested subjects at all social levels and is so designed not only for public administration institutions but also for all other parts – individuals, communities, non-profit and private sector, education, science and other institutions. The implementation of Health 2020 – National Health Protection and Support Strategy and Disease Prevention was supported by the government already 2014 in the resolution No. 23 from 8 January as well as by the Chamber of Deputies in its resolution no. 175 from 20 March 2014 as the way to the health improvement of the population of the Czech Republic. A subsidy scheme of the Ministry of Health "National Health Programme – Health Support Projects" is intended to support the strategy Health 2020. The project of the Medical College Prague dealing with short interventions in medical institutions was repeatedly financially supported from this subsidy programme for public health protection and support in 2016–2017. The short intervention method becomes so a very effective health literacy development tool for the adult population in the Czech Republic, as it was not systematically educated in the health and the healthy lifestyle support. The health literacy in the current infant and adolescent population is formed and developed in the framework of the lower secondary education in the Czech Republic in the subject Education to Health which is a part of the educational field The Man and his Health (Hřivnová, 2014, 2016).

1 Objectives

Short interventions are practical procedures proposed by WHO and clearly defined that by means of picture educational cards intelligibly explain to intervened participants influence and impact of their behaviour causing demonstrable increase of health risks and endangerment of their health. Short interventions are dealing mostly with occurring lifestyle risk factors namely excessive alcohol consumption, smoking, insufficient physical activity, unhealthy diet and refusal of influenza vaccination what are factors demonstrably decreasing public health. Short interventions applied practically increase health literacy of intervened participants and so it is possible to eliminate or decrease risk factors in the population. The long term aim of the comprehensive application of short interventions is declining incidence rate of diseases resulting to a large extent from an unhealthy lifestyle, especially cardiovascular, tumorous and metabolic diseases. A very important aspect in the course of interventions is to strengthen the patient's motivation for a change of his lifestyle with the explanation of all positive factors resulting. As Kitová et Mazalánová states that strengthening patients motivation to change their lifestyle by means of an explanation about all positive effects the lifestyle change brings, is a very important aspect of intervention. The education has a big importance at patients before and after serious surgeries and other therapeutic treatments (Kitová Mazalánová & Mazalánová, 2017). Škochová emphasizes e.g. the importance of an education on the field of nutrition and physical activities in obese patients after bariatric surgery (Škochová, 2011). Škochová and Čurdová also note that education is one of suitable opportunities for gaining patient's confidence in treatment success and in mutual collaboration (Škochová & Čurdová, 2015). The financial expensiveness and the time required for short interventions is minimal. In the framework of the subsidy procedure of the public health protection and support department of the Ministry of Health of the Czech Republic there was 2016–2017 financially supported the project *Application of the short interventions method into practice.*

2 Methods

The students of the 1st-3rd year of bachelor studies in the field General nursery of the Medical College Prague were instructed and carried out the interventions with selected patients in outpatient and inpatient wards of health-care facilities throughout the Czech Republic the Medical College has completed professional training agreements. Patients in outpatient and inpatient wards of health-care facilities were intervened in the period from 1. 1. 2016 – 31. 12. 2017, where students of the field of study General Nursery at the Medical College performed their professional training or where they were working. Each student was given 24 educational cards, a short intervention manual created by professionals from the National Institute of Public Health and they were also practically instructed in the course of their lessons. The higher and middle management of health-care facilities was informed in advance by the researcher – the professional training coordinator about the project implementation. Intervention suitable patients were selected upon the recommendation of the doctor or the ward nurse. The level of risk factors by mapping the addiction abuse drugs was found by using of standardized WHO questionnaires (FTQ and AUDIT), NIPH questionnaires for the nutrition and physical activity and knowledge about influenza vaccination (NIPH and Medical College questionnaires).

3 Results

In the implementation framework of this 2-year-project 3,905 patients in total from 63 health-care facilities were educated, 1,665 (42.6%) of them men and 2,240 (57.4 %) women, who have 6,365 risk factors and where 5,890 lifestyle risk factors were intervened in total. On the whole, 16.4% of intervened participants had primary education, 60.5% secondary education and 23.1% higher education. In the case of most participants there was the risk factor of smoking that was intervened with 1,592 participants (27.0%), unhealthy diet intervened with 1,526 participants (25.9%), insufficient physical activity with 1,335 participants (22.7%), alcohol abuse 924 participants (15.7%) and the least were intervened in conjunction with the influenza vaccination, namely 513 participants, 267 of whom were in the risk group (52.1%) and 105 participants was medical personnel (20.5%). The effectiveness of short interventions in the framework of the implemented project was evaluated on the basis of a questionnaire survey, in which the patient replied if he was resolved to change his behaviour. At the same time, the patient was asked if he regarded the intervention as an intrusion into his privacy. As a whole, 929 (45.7%) participant stated their intention to increase their physical activity resulting from the performed intervention, 932 (49%) stated their intention to reduce smoking, 344 (18.1%) decided to break their smoking habit and 263 (13.8%) considered visiting a centre for smoking cessation. As a result of the intervention, 417 (43.8%) patients made a decision about cutting down on alcohol. 1,069 participants (48.7%) decided to adjust their unhealthy diet. As a whole 310 (60.4%) participants are of the view they have enough information about influenza and its seriousness and for 29.8% from the panel influenza is not a grave illness and that is why they refuse the vaccination. In the framework of the questionnaire survey participants were also asked about the education as an intrusion into their privacy. The intervention was regarded as an intrusion into the privacy mostly in the alcohol consumption field (23.8%), smoking 19%, diet 11.8%, physical activity 9.5% and at least regarding the vaccination against influenza, namely only 7% of the participants.

4 Conclusion

The implementation of the 2-year project was evaluated every year by the evaluating committee of the Ministry of Health of the Czech Republic and the project received in both years the evaluation 1, *the project expectations were excellent met, the effect was achieved.* The project brought for inpatients as well as outpatients increased information about harmful impacts of alcohol and tobacco abuse, about healthy diet principles and reasonable physical activity and it motivated the patients to influenza vaccination. It led the patients to a change of attitudes influencing decision making in favour of the healthy lifestyle and strengthened their responsibility for their own health. The project implementation by the Medical College Prague contributed to the fulfilment of national action plans approved by the government of the Czech Republic, namely AP 1 *Physical activity support*, AP 2a *Healthy diet and nutritional habits*, AP 2b *Obesity prevention*, AP 4 *Reducing health risk behaviour*, AP 6 *Handling of infectious diseases*, AP 9 *Ensuring of quality and security of provided medical services*, AP 10 *Long life learning of medical workers* and in particular AP 12 *Development of health literacy*.

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Who Are Paediatric Speleo Therapy Patients?

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Abstract: Speleo therapy is a climatic therapy method using the specific cave climate as a natural source for complementary treatment of asthmatic patients reducing their complex pharmaceutical therapy to minimum.

The purpose of this contribution is to present the socio-demographic profile of the patients attending speleo therapy in the Paediatric Sanatorium with Speleo Therapy at Ostrov u Macochy, and define their regional distribution across the Czech Republic.

The patient profile is based on data of randomly selected (733) patients of the Paediatric Sanatorium with Speleo Therapy at Ostrov u Macochy (by descriptive statistics and graphic visualisation of data).

The profile shows prevalence of boy (58.9%) over girl (41.1%) patients, in the most common age group of 5–10 and under repeated therapy in nearly half of the sample cases (48.3%). The most frequent diagnoses include bronchial asthma, recurrent respiratory infections and exercise induced asthma and a considerable part of the patients also suffer from various forms of allergies (74.4%). A prevailing majority of the children shows improvement of their health condition after a speleo therapy session cycle (95.5%) with recommended repetition of the therapy (98.9%). The geographic structure of the patients attending the sanatorium shows prevailing patient recruitment from South Moravia, Moravian Silesia, South Bohemia, Central Bohemia, Vysočina and Prague regions.

The results demonstrate the importance of speleo therapy for improving the health of patients.

Key words: health, speleo therapy, asthma, geographic structure, Moravian Karst

As shown by epidemiology studies, the global count of patients with diagnosed bronchial asthma exceeds 300 million, with different prevalence and significant geographic variability (Hübelová, Kozumplíková, & Überhuberová 2018). The development of the numbers of patients under pharmaceutical therapy for asthma diagnosis in the Czech Republic shows a slightly growing long-term trend. In the Czech Republic the health care of asthmatic patients is very high-standard with availability of nearly all known drugs, diagnostic and therapeutic procedures. The main risk factor applicable under our conditions is underestimation of the disease and insufficient quality of long-term preventive therapy (Pauk, 2016).

Bronchial asthma is a chronic respiratory disease belonging to the group of diseases whose progress and development can be affected by preventive care. Bronchial asthma is a "complex disease" with chronic inflammation of the airways as the basic mechanism of the disease. The airways are conceived for this purpose as a unified system beginning in the nose and ending in the lungs. The variability of clinical manifestations of asthma is given by the variability of the inflammatory mechanisms with a role played not only by eosinophils but also other cell populations including structural cells (epithelium, endothelium and smooth muscle cells) and

neural effects. Activation of these cells causes release and generation of biologically active substances (histamine, leukotrienes, cytokines, NO), which then strongly affect the clinical symptoms. The largest risk group for asthma onset is represented by patients with atopic manifestations or with already clinically manifested allergies (Lau et al., 2016). The complex factors affecting development of asthma can be classified as primarily genetically influences factors and factors of the environment. Individual genetic predispositions take about two-third share in the etiology and clinical phenotype of asthma (Noutsios & Floros, 2014). The variable clinical image of asthma with chronic inflammation, reversibility of bronchial obstruction and variable bronchial hyper reactivity results from interactions of genes with environmental factors, including allergens with their specific immunological effects (Di Novi, 2013; Šrám et al., 2013). And last but not least, the patient's way of life plays an important role too (Hazenkamp-von Arx et al., 2004). All these effects not given by the genetic predisposition must be considered in the therapy management.

In more than a third of all cases asthmatic symptoms already appear in the course of the first five years of life but their onset can be experienced in any age group. The prevalence of asthma has shown a growing trend in the current quarter century: in 1996 the percentage of asthmatic patients in the age group under 17 reached 3.8% (Robertson et al., 1998), in 2001 rising to 6.7% and the present qualified estimate is 8.0% (GINA, 2018). There is an assumption that by 2025 there will be another 10 million new asthmatic patients. The growing prevalence of asthma is connected with increasing atopic prevalence, currently ranging between 30 and 40%, and parallel growth of occurrence of other allergic diseases such as allergic rhinitis and eczema (GINA, 2018).

Data of the Institute of Health Information and Statistics of the Czech Republic show that the mean number of asthmatic patients under therapy at the age of 15–19 years in the Czech Republic in 2013 ranged around 1,200 patients/100 thousand people in the given age group. Above-average numbers of these patients are registered in the following regions: Zlínský (more than 1,800/100 thousand inhabitants), Moravian Silesia (1,500/100 thousand inhabitants), Liberecký and Prague (identically around 1,400/100 thousand inhabitants; IHIS CR, 2014). Overall prevalence of asthma in the Czech Republic is estimated to be 8% (800 thousand individuals), with the values of over 10% in the paediatric population. Despite this relatively high proportion a great number of patients are assumed not to be diagnosed at all yet. A number of undiagnosed cases in the Czech Republic occur among the lowest age groups, among seniors and among patients with persistent allergic rhinitis (Pohunek & Svobodová, 2007).

The percentage of asthmatic patients places the Czech Republic among the group of countries with asthma prevalence ranging between 7.6 and 10.0%. The lowest percentages are reported for India, Indonesia, Iran, Malaysia, Albania, China and Greece (Asher et al., 2006). Prevalence over 10% is shown by the U.S.A. (10.9%), Brazil (11.4%), Canada (14.1%), Ireland (14.6%), Australia (14.7%), New Zealand (15.1%), England (15.3%) and Scotland in the lead (18.4%; Patel, Järvelin, & Little, 2008).

Speleo therapy is one of the climatic therapy methods (Simionka et al., 2009; Rashleigh, Smith, & Roberts, 2014; Kendrova et al., 2016). It is based on the unique features of underground environment, especially karst caves. In the Czech Republic speleo therapy of paediatric patients has been provided since 1979 and in 1982 the Paediatric Sanatorium with Speleo Therapy was established to assist treatment of asthmatic and allergic patients under therapy at Ostrov u Macochy. The sanatorium was involved in various research projects in 1980s, defending the positive effect of speleo therapy on paediatric patients with bronchial asthma (the research was managed by doctors of medicine, Mr. Říčný and Mr. Slavík, MDs, and titled *Studies of Use of Speleo Therapy in Complex Care of Asthmatic Patients* and *Role*

of Speleo Therapy in Complex Treatment of Bronchial Asthma). The purpose and results of speleo therapy were also subject of earlier research implemented in the then Czechoslovakia, as well as in Poland and Hungary, and mentioning significant health improvement in one fifth of paediatric patients with bronchial asthma (Kessler et al., 1969; Bichonski & Skumlowski, 1971; Paskova, Kolesar, & Siposova, 1976). The research performed in Bystrá cage in Czechoslovakia and enrolling 80 asthmatic children at the age of 4–15 years proved considerable success of the therapy, especially in the 4–6 age group (Timova, Beer, & Svac, 1977).

Speleo therapy both improves clinical and immunological parameters and changes the image of functional examination of the lungs of asthmatic patients. The published results show that permanent improvement was achieved by speleo therapy in children with mild to moderate progress of asthma (Abdullaev, Gadzhiev, & Eiubova, 1993). So far no summary of the social profile of the patients attending speleo therapy has been published. This is partly given by the scope of care defined by the health insurance companies paying for the stays of paediatric patients in the therapeutic facilities and also by the fact that the statistics generally describe patients with chronic respiratory diseases.

1 Objectives

The purpose of the research was to find the socio-demographic profile of paediatric patients enrolled in speleo therapy in the Paediatric Sanatorium with Speleo Therapy at Ostrov u Macochy and to define their regional distribution across the Czech Republic. The information was taken from archived data of patients undergoing the therapy with a focus on the past decade and on the basis of random selection.

2 Methods

Data were collected from November 2017 to March 2018, the total number of selected patients was 733 and the number of edited indicators was 16 in total (including socio-demographic and medical indicators). This contribution deals with 10 of the total 16 mentioned indicators, including:

1) gender;
2) age;
3) place of residence according to the post code;
4) year of the first admission of the child in the sanatorium;
5) number of treatment cycles;
6) principal admission diagnosis;
7) condition after speleo therapy;
8) therapy continuation;
9) allergies;
10) occupations of mother and father of the child.

The basic socio-demographic profile of the patients was obtained by descriptive statistics and graphic visualisation of data. The geographical distribution of the patients was specified on

the basis of post codes from depersonalised patient data. For some municipalities, especially in the case of big cities, several post codes were grouped into a single whole to keep the basic settlement structure in the Czech Republic. For every resulting post code group the total number of patients treated in the paediatric sanatorium in the past decade was summarised. These data were subsequently visualised in a simple map.

3 Results

Descriptive statistics showed that the total number of the selected 733 paediatric patients included a higher percentage (58.9%) of male patients (boys) versus a lower percentage of female patients (girls, 41.1%). The age spectrum of the patients was broad, ranging from 2 to 16 years. The largest age group was represented by children from 5 to 10 years old, making nearly 80% of all the patients (Figure 1). The representation of this age group reflects the trend of the fastest growing prevalence of asthmatic patients at that age.

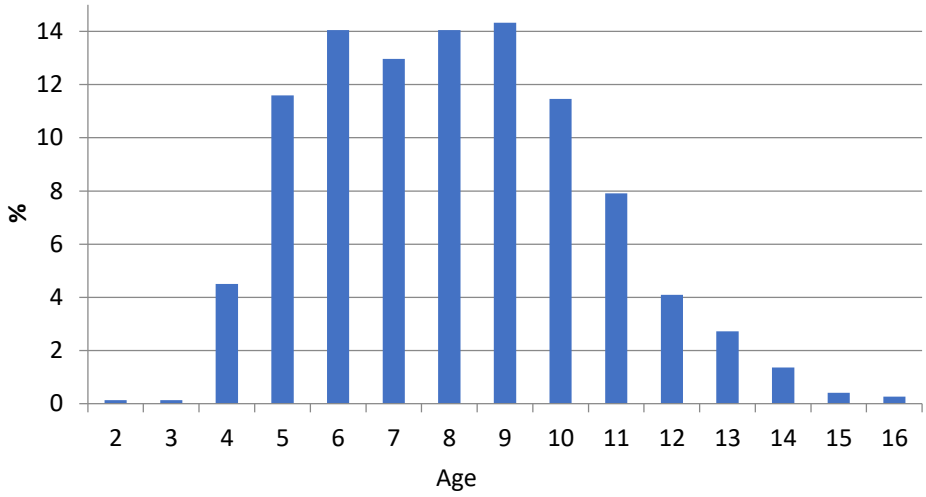

Figure 1. Percentages of patients by age (N = 733).

Geographic (spatial) distribution of paediatric patients treated in the sanatorium was based on usual place of residence of the children (defined by post code). Clearly most of the children taking part in the therapy were recruited from South Moravia, Moravian Silesia, South Bohemia and Central Bohemia, Vysočina and Prague regions (Figure 2).

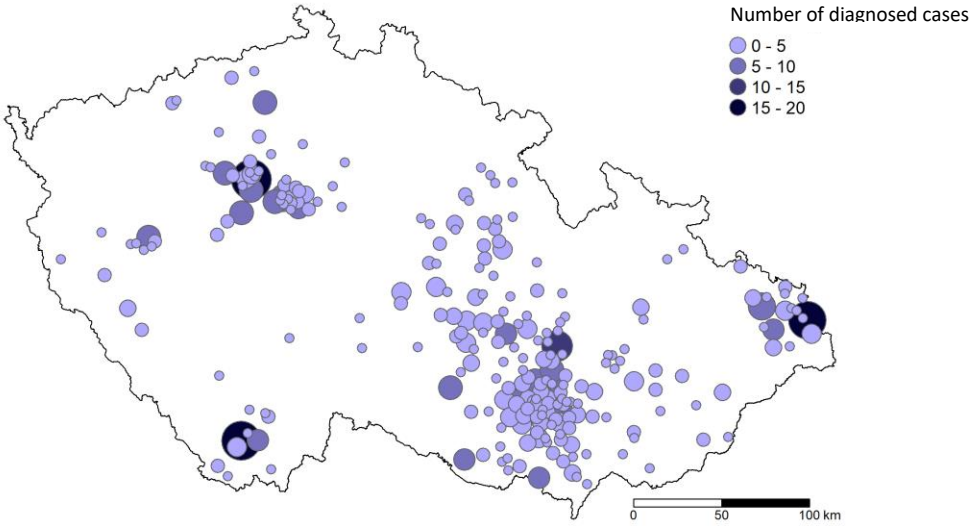

Figure 2. Geographic distribution of the patients based on their usual place of residence (numbers; N = 733).

Out of the 733 patients the highest number was admitted for the first therapeutic cycle in 2015 (16.6%). Further years with a significant proportion of children first attending speleo therapy were 2016 (12.8%) and 2014 (11.9%). A certain trend is manifested in the development of the proportion of patients admitted to the sanatorium for their first speleo therapy: while in the period of 2004 to 2015 the numbers of the treated children tended to increase, the following period was marked by a certain drop in their numbers (Figure 3). This decrease is given by the overall reduction of the total number of patients by those with completed therapy and improved condition, compensated by increased standards of the therapy and higher comfort, especially for younger children, represented by the presence of their mothers during their stay in the sanatorium. Improvement of treatment quality was mainly represented by extension of most of the therapeutic cycles from three- to four-week cycles.

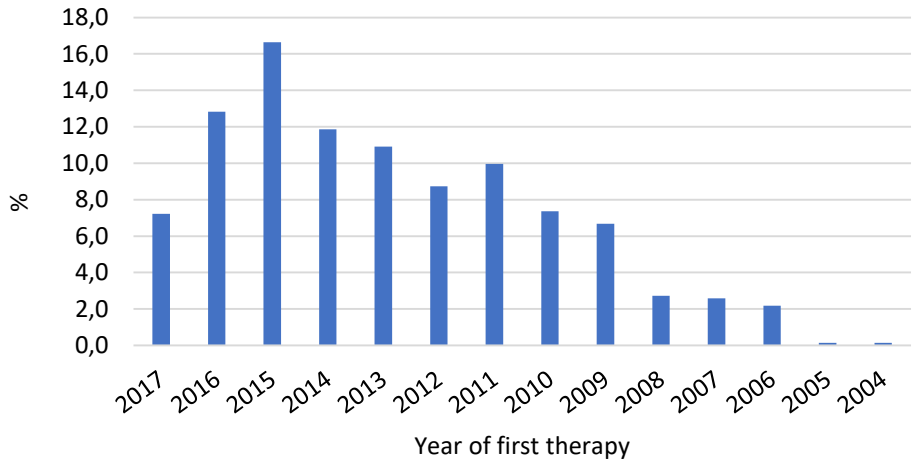

Figure 3. Proportion of patients admitted to their first therapy in the years 2004–2017 (N = 733).

More than a half took one speleo therapy cycle (51.7%). Repeated therapy was undergone by 48.3%, with the highest proportion of two (24.0%) and three (11.9%) speleo therapy cycles. Four and more repetitions were not so significant in the overall proportion of the patients, but still there were children in the study population who took up to nine cycles of speleo therapy (Figure 4).

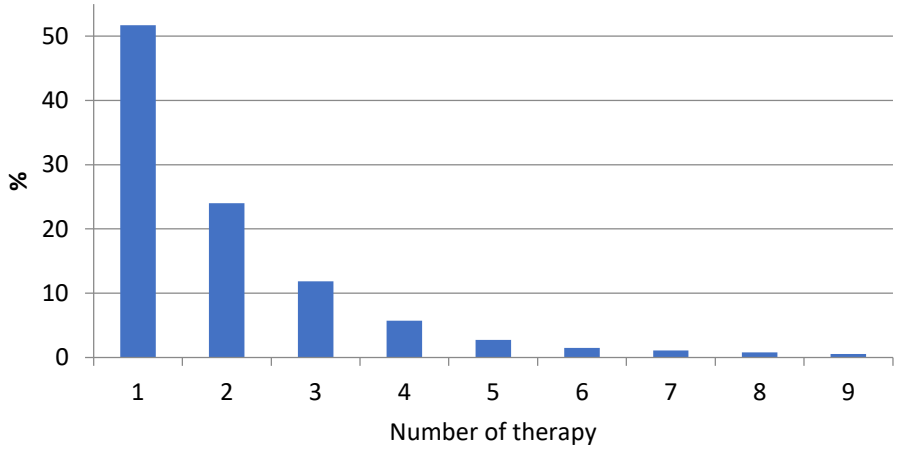

Figure 4. Proportions of patients according to the numbers of speleo therapy cycle repetitions (N = 733).

The patients were also classified by their first diagnosis on admission to the sanatorium. The largest prevalence was shown by bronchial asthma (54.8%) and recurrent respiratory infections (22.0%). Other diagnoses were considerably lower in numbers (exercise induced asthma 8.7%; bronchitis recidivas 5.0%; atopic eczema (pre-asthma condition) 2.5%; chronic rhinitis (pre-asthma condition) 1.9% and rhinosinusitis a sinusitis 1.5%; Figure 5). There were also other diagnoses with insignificant representations in the cohort under 1 percent.

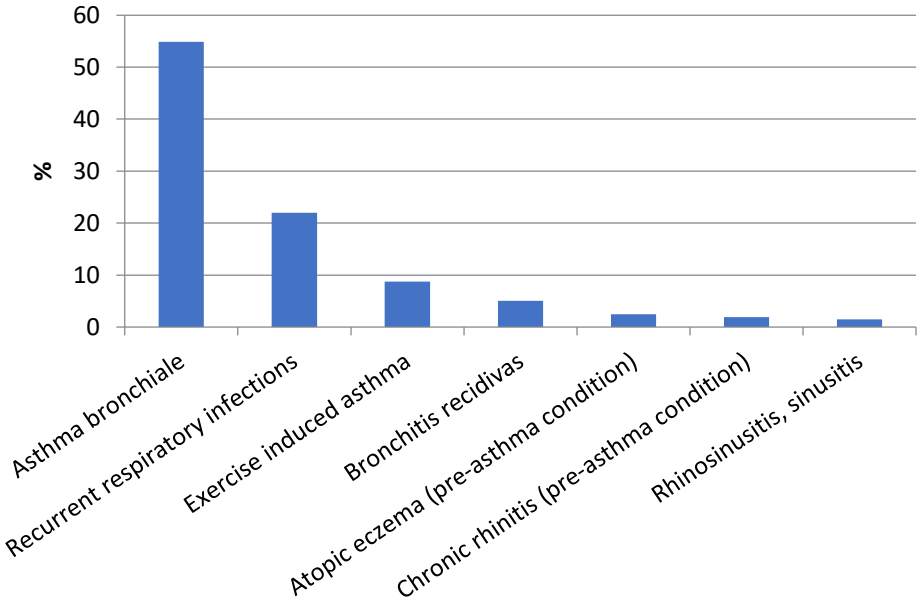

Figure 5. Proportion of patients by first diagnosis on admission to speleo therapy (N = 733).

The results of the medical reports and the indicators monitored in the course of speleo therapy (spirometry at rest and under load in the cave, repeated in the course of the PEF day, immunological parameters – mainly Ig E, ECP, initial kinesiological analysis by physiotherapist, nasopharyngeal swabs etc.) document a clearly positive impact of speleo therapy on the patient heath condition. The final reports report health improvement in 95.5% of the patients, with stagnation reported for only 4.5%. These data correspond to the standard of 5% of individuals with symptoms hard to affect by the speleo therapeutic method (what needs to be realised is that strong genetic predisposition contributes to the clinical image in up to two thirds of all cases). Success of speleo therapy is further conditioned by (family) environment factors forming the treated child's background, including the level of compliance with the way of life of asthmatic/allergic child before the speleo therapy commencement, such as incompliance with the drug dosage where the children are usually "underdosed" for fear of adverse effects of inhalation corticosteroids, controlling asthma before the therapy commencement. These individuals can just stabilise their condition by speleo therapy and its effect therefore cannot be that apparent.

The reports on the success of the speleo therapy are followed by recommendations for repeated speleo therapy sessions in 98.9% of cases, with just 1.1% of patients to whom repeated therapy is not recommended. The reasons mostly include psychiatric diagnoses of anxiety, autism etc. In the case of these children the cause of limitation of speleo therapy is their behaviour and safety in the cave. These children find it hard to cope with the group of children around them and with the stay in the dark cave and thus the risks of speleo therapy for them outweigh the benefits of its effect on their airways.

Allergies of different kinds represent the most frequent cause of asthma for speleo therapy indication. Nearly three quarters of the study cohort suffered from an allergic disorder (74.4%), the rest were children with non-allergic disease or other causes of their asthma (25.6%).

The family background is one of the social indicators of health, with type of occupation indicative for example of the financial standing of the family with "hidden" reflection in the health conditions of the family members. Nearly about half of the parents of the paediatric patients under research (50.1% of mothers and 42.0% of fathers) were employed in the third sector of economy (office, finance, public administration, education, science etc.). A lower proportion was represented by the second economic sector (22.0% of fathers and 13.2% of mothers; processing industry, commerce, transport, building etc.). These data may be somewhat biased, though, for around one fifth of the parents did not mention their occupations at all (21.7% of fathers and 17.6% of mothers). One tenth of the mothers with one child in speleo therapy were on maternity leave with a sibling of the treated child (9.7% of mothers; no father on parental leave). In 8% of cases the family had no father, and in 1.5% there was no mother in the family (Figure 6).

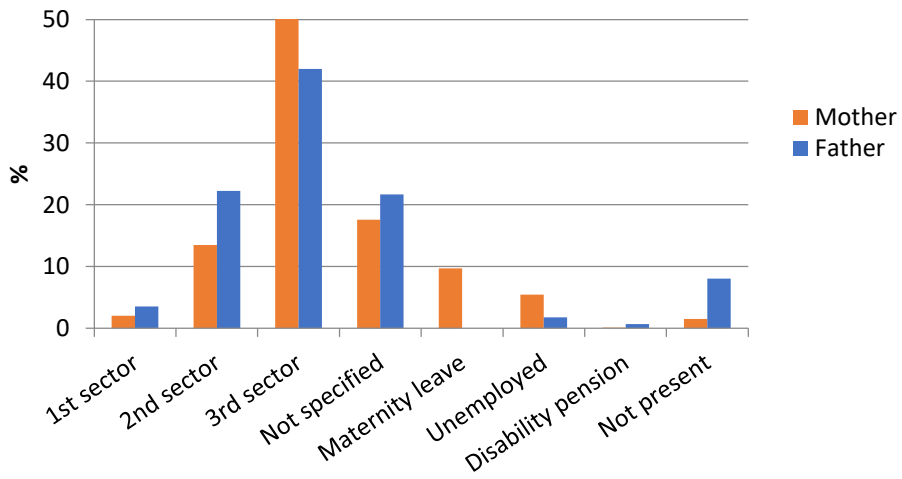

Figure 6. Patient percentages by mother's and father's occupations (N = 733).

4 Conclusion

The patient profile is based on data obtained by random selection (of 733 patients) in the Paediatric Sanatorium with Speleo Therapy at Ostrov u Macochy. The findings show prevalence of boy (58.9%) over girl (41.1%) patients, in the most common age group of 5–10 and under repeated therapy in nearly half of the sample cases (48.3%). The most frequent diagnoses include bronchial asthma, recurrent respiratory infections and exercise induced asthma. The reports on the success of the speleo therapy after its finish mention health improvement in 95.5% of all paediatric patients and are followed by recommendations for repeated speleo therapy sessions (in 98.9% of cases). The geographic structure of the patients attending the sanatorium shows prevailing patient recruitment from South Moravia, Moravian Silesia, South Bohemia, Central Bohemia, Vysočina and Prague regions.

The drop of the number of patients recruited for their first therapy in the recent years is given by extension of the cycles from three-week, fixed until 2014, to four-week cycles, largely prevailing since 2015. Since 2015 children with higher morbidity rates at the age of 4–6 years have been prioritised in admission and a parent (mostly mother) has been allowed to stay with his/her child throughout its stay in the sanatorium. Although the current sanatorium capacity requires reduction of the number of treated children due to the parental stay as the total number of beds is limited, the effect of the therapy in the case of children at this age has been increased considerably thanks to this measure. The advantages of treatment/repeated treatment of preschool children include long-term improvement of their health condition not requiring further therapy repetitions at their school age. This is especially beneficial in cases where defence of long-term absence from school for the reason of asthmatic therapy is hard despite the fact that the sanatorium operates its own elementary school which the paediatric patients attend daily during their stay.

The results of our research in the role of speleo therapy in improvement of health condition of asthmatic patients are consistent with the commonly presented effectiveness of speleo therapy. Generally in 75–80% of individuals speleo therapy is able to positively affect their health condition already in the course of their first therapeutic cycle. Repeated cycles show positive effects on the remaining patient percentage (20%). The about 5% of patients without improvement are represented by patents with symptoms hard to affect by this therapeutic method, mainly due to the strong genetic predisposition of these individuals.

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Dedication and acknowledgement

The text was created in the project "Socio-demographic and environmental factors of the development and incidence of non-infectious diseases in the Czech Republic" with registration number 2018/013 supported by the Internal Grant Agency of the Faculty of Regional Development and International Studies of Mendel University in Brno. Great thanks go to Mrs. Ivona Žáková - station nurse of the Paediatric Sanatorium with Speleo Therapy at Ostrov u Macochy for her help and cooperation in data collection.

Health Protection against Noise? Selected Legal Aspects

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Abstract: The current legislation of the CR does not consider as noise, inter alia, the sound from production of music operated outdoors. Production of music outdoors mainly includes concerts, discotheques, pilgrimages, open-air markets, various celebrations, Advent concerts, music played during sporting and cultural events, etc. (also including certain daily or frequently repeated cases of such production). The enforceability of protection against such noise pollution is becoming highly problematic (Motejl et al., 2010).

The legal issue of protection from noise is mainly regulated by Act No. 258/2000 Coll., on public health protection, as amended, implementing Government Regulation No. 272/2011 Coll., on protection of health from adverse effects of noise and vibrations, as amended and in the framework of legal regulation of generally binding ordinances, chiefly Act No. 128/2000 Coll., on municipalities, as amended. In terms of protection from noise pollution emanating from production of music operated outdoors, Act No. 267/2015 Coll., effective 01 December 2015, amending and supplementing the Public Health Act, introduced certain changes over the previous legal regulation. By this amendment, all forms of producing music operated outdoors were removed from the conceptual definition of noise, thus also from the oversight powers of public health protection agencies. Of course, questions remain as to whether or not this amendment to the Public Healt Act is truly projected into effective public health protection, and if with this new concept, it contradicts the Public Health Act.[8]

Keywords: noise, legislation, enforcement, public health, control mechanism

Pursuant to valid legislation, "sound from the production of music operated outdoors is not considered noise". On the contrary, public production of music inside a building is considered noise.[9] In keeping with Sec 30(1) of the PHA, a person organizing public production of music (and if it not possible to ascertain who the organizer is, then the person having provided a building, other facility or grounds for holding the public production of music) is obliged to ensure that the noise does not exceed public health limits regulated by the implementation regulation for protected outdoor space, protected indoor space of buildings and protected outdoor spaces of buildings, and to protect from excessive transfer of vibrations onto natural persons within the protected indoor space of a building. The enforceability of the mentioned obligation is of course extremely problematic taking into account the provisions of Sec 30(2) of the PHA. The relevant provisions do include in their first sentence the definition of the term "noise"[10], but in the very next sentence of this provision, "sound from production of music operated outdoors" is somewhat contradictorily removed from this legal definition, as it is no longer considered noise. So an utterly fundamental question remains: by whom and by what means according to current legislation are control and oversight over production of music ensured in terms of protecting the public interest of human health protection?

[8] In keeping with the provisions of Sec 1 of the PHA, this act should, inter alia, serve to protect and support public health and to assess and decrease noise.

[9] Compare the provisions of Sec 30(2), second sentence of the PHA.

[10] Noise is understood as sound that can be damaging to health, and whose public health emission limit is determined by an implementation regulation (i.e. the Government Regulation).

In light of the circumstance that production of public music outdoors de lege is no longer being regarded as noise, it is not possible to apply control mechanisms in terms of the PHA. In other words, it means that public health protection authorities (i.e. mostly regional public health offices) no longer are authorized to check and possibly sanction the exceeding of public health noise limits by the public production of music. It is somewhat paradoxical because for these events, the organizer or other person providing a building or grounds to hold such an event is still obliged to ensure that public health noise limits determined by the implementation regulation are not exceeded![11] Such determined obligations on the part of organizers of production of public music of course now have no support in terms of control mechanisms protecting public health according to the PHA, and are thus from this perspective "toothless", because their enforceability has been stripped away.

1 Problematic public health limits

In the given context, it is possible to currently refer to the decision of the Supreme Administrative Court of 29. 3. 2016, case no. 6 As 44/2014-88, in which the expanded panel of judges of the Supreme Administrative Court judged the legal question of whether general regulation of noise limits anchored in Sec 12 of the Government Regulation, and further in appendix no. 3 of said Regulation, exceeded the limits of statutory authority. The core of the review involved public health limits, or their "settings", which allegedly eliminate the holding of any musical events near protected outdoor public space of buildings. The court stated that the Public Health Act was apparently not built upon a concept that would broadly ban the public production of music in built-up parts of a municipality. The Act, in the court's opinion, was on the contrary apparently built on the concept that upon compliance with noise limits, concerts and similar events in municipalities may take place. Pursuant to the provisions of Sec 32 of the PHA (effective until amendment of the PHA by Act No. 267/2015 Coll.), noise from public production of music (e.g. a concert, dance entertainment, an artistic production with music) was not allowed to exceed public health limits modified by the implementation regulation for protected spaces as stated in Sec 30 of the PHA. Meanwhile, this standard specified a person who was to ensure compliance with this obligation. In the given context, the court considered important the fact that it was not possible to obtain an exemption from noise limits from public production of music, whereas upholding noise limits in or near municipalities in this condition was basically impossible. Based on this, it then expressed its conclusion that if the Government Resolution contained an explicit ban on production of music in built-up areas, there would be no dispute about the fact that this implementation regulation would create a new ban above the legal framework and outside legal limits. With regard to the aforementioned, the Supreme Administrative Court concluded the adjudged case whereas if based on noise limits determined by the Government Resolution, the administrative authority imposed a penalty on the complainant, it would do so in violation of the obligation only just established by the Government Regulation (i.e. implementation regulation), and not by the Act. The court found that such a sanction has no support in the law, and thus runs contrary to constitutional order (Article no. 39 of the Charter of Fundamental Rights and

[11] Compare the provisions of Sec 30(1) of the PHA, under which, *inter alia:*

[...] a person organizing the public production of music, and if it is not possible to ascertain who the organizer is, the person having provided a building, other facility or grounds for holding the public production of music, as well as an operator of a facility and other buildings, by whose operation noise is produced (hereinafter "source of noise or vibration"), are obliged to ensure by technical, organizational and other measures that noise does not exceed public health limits regulated by the implementation regulation for protected outdoor space, protected indoor space of buildings and protected outdoor spaces of buildings, and to protect from excessive transfer of vibrations onto natural persons within the protected indoor space of a building.

Basic Freedoms), so the decision of administrative authorities on imposing a penalty cannot stand. In the court's opinion, Czech legislators neither prohibited public production of music in or close to municipalities nor acknowledged the possibility of requesting an exemption in these cases (as opposed to other sources of noise). If the law gave to specifically determined persons the obligation of ensuring compliance with noise limits, the court is of the opinion that evidently it came from the fact that noise limits would be possible sometimes to breach, and sometimes to uphold. But according to the government regulation on public health protection from adverse effects of noise and vibrations, this was not the case, because complying with noise limits in or close to municipalities was basically impossible. In the court's opinion, it is still necessary to assess the situation in which the Government Regulation does not explicitly contain a similar ban, but it does set limits so strictly that in practice they cannot be upheld. Therefore, the court concluded that if according to the Government Regulation, it would not be possible to hold a concert or other music production in a built-up part of a municipality or nearby and meanwhile comply with limits determined by such regulation, this regulation, in the part where it regulates noise from public production of music, has gotten completely outside the framework of the Public Health Act. According to the conclusions of the court, the regulation is therefore unconstitutional, in conflict with Article no. 4(1) of the Charter and Article no. 2(4) of the Constitution, and general courts, including the Supreme Administrative Court, cannot apply such regulation in an individual case with regard to Article no. 95(1) of the Constitution.

2 Protection of public order during public production of music outdoors and generally binding municipal ordinances

Under the Municipalities Act[12], in order to ensure local matters of public order the municipality may determine just what activities, which could disrupt public order in the municipality or run contrary to good morals or protection of safety, health and property, can be exercised only at places and times determined by a generally binding ordinance, or determine that such activities are banned in certain public areas of the municipality. This mainly applies for the holding, course and completion of publicly accessible sports and cultural enterprises, including dance entertainment and discotheques, etc. In the general level, a nuisance by noise (and vibrations), which could disrupt public order, is regulated effective from 01 October 2016 to 30 June 2017 in the provisions of Sec 47(1)(c) in relation to the provisions of Sec 47(6) of Act No. 200/1990 Coll., on offenses, as amended. Pursuant to this legislation, also considered an offense against public order, inter alia, is disturbing the peace at night (during night rest).[13] The period of night rest means the period from 10:00 p.m. to 6:00 a.m. The municipality may determine exceptional cases by generally binding ordinance, especially celebrations or similar social or family events, during which the period of night rest is limited by a shorter period or there is none at all.[14] Effective 01 July 2017, protection of public order during public production of music is regulated in the provisions of Sec 5 of Act No. 251/2016, on certain offenses (hereinafter the "Act on Certain Offenses").[15] For the offense of disturbing night rest, a natural person, legal entity or individual entrepreneur may be imposed a penalty of up to CZK 10,000.[16] Meanwhile, the definition of the period of night

[12]Compare the provisions of Sec 10 of Act No. 128/2000 Coll., on municipalities.
[13] Compare the provisions of Sec 47(1)(c) of the Offenses Act.
[14] Compare the provisions of Sec 47(6) of the Offenses Act.
[15] Both a natural person – pursuant to the provisions of Sec 5(1)(d) – and a legal entity – provisions of Sec 5(2)(a) – may commit the offense of disturbing the night rest in keeping with the Act on Certain Offenses.
[16] Compare the provisions of Sec 5(3)(b) of the Act on Certain Offenses.

rest remains identical with the previous legislation.[17] Regarding the issue of ordinances in the actual power of municipalities concerning, inter alia, public production of music outdoors, it is possible to refer to settled case law of the Constitutional Court.[18]

Effective 01 October 2016,[19] the Offenses Act regulates the possibility of issuing a generally binding ordinance in which exceptional cases will be determined (especially celebrations or similar social or family events), during which the period of night rest is limited or there is none at all. These exceptional cases must be stated in the generally binding ordinance exhaustively, because it does not arise from the current wording of the Offenses Act that these exceptional cases could also be determined by decision issued on the basis of a generally binding ordinance. Already in the framework of its settled case law, the Constitutional Court acknowledged the possibility of regulating an activity implemented not only directly in public areas, but also outside of them, by means of generally binding municipal ordinances, if the consequence of regulated activities projects into public areas or is liable to cause interruption of public order in the municipality.[20]

The Constitutional Court has recently dealt with determining exceptional cases according to the Offenses Act, when the period of night rest is shorter or nonexistent, in its finding on case no. Pl. ÚS 4/16 (Chrastava). The Constitutional Court ruled how exceptional cases are to be determined when the period of night rest is shorter or nonexistent – either by a specific date, datable period or event whose date is regular due to local traditions. It therefore clearly arises from both the Offenses Act and the finding of the Constitutional Court that a shorter or nonexistent period of night rest should be determined only in exceptional cases.

3 Control mechanisms?

In relation to the aforementioned, one must consider the question of whether it is possible to rely on some adequate control mechanisms in the area of human health protection during public production of music outdoors. In light of the circumstances that production of public music outdoors can no longer be regarded as noise pursuant to valid legislation, it is not even possible to apply control mechanisms in terms of the PHA. By amendment of the PHA by Act No. 267/2015 Coll., effective 01 December 2015, public health protection authorities no longer have legally relevant power to control and possibly sanction the exceeding of public health noise limits from the public production of music.

The Ministry of Health, in the framework of its conceptual activity under the PHA, should meanwhile mainly prudently determine limit noise indicators for the area of public health protection.[21] For the purposes of conceptual activity, noise is considered such noise pollution, which people are exposed to in built-up territories, in public parks, quiet areas in agglomerations and in open country, and especially in territories sensitive to noise (Bernard & Doucha, 2008). In terms of the negative conceptual definition, for the purpose of this

[17] Pursuant to the provisions of Sec 5(6) of the Act on Certain Offenses, the period of night rest is considered the time from 10:00 p.m. to 6:00 a.m. The municipality may determine by generally binding ordinance exceptional cases, especially celebrations or similar social or family events, during which the period of night rest is limited by a shorter period or need not be upheld at all.

[18] Compare e.g. the finding of the Constitutional Court in case no. Pl. ÚS 35/06 (Kořenov).

[19] Compare Act No. 204/2015 Coll., amending Act No. 200/1990 Coll., on offenses, as amended, Act No. 269/1994 Coll., on the Criminal Register, as amended, and certain other acts.

[20] Compare e.g. the finding of the Constitutional Court in case no. Pl. ÚS 58/05 (České Velenice).

[21] See e.g. the Ministry of the Environment of the CR. Ministry of Health of the Czech Republic. (2015). *Start page of strategic noise mapping.* Retrieved from http://www.mzcr.cz/ hlukovemapy/ obsah/uvodni-stranka-shm_3375_30.htm

conceptual activity, noise is not considered such noise that is caused by a person who is exposed to it, noise in households, noise from neighbors, noise from recreational activities, noise at workplaces, noise inside means of transport, noise caused by military activity, etc. (but not noise from public production of music outdoors).[22]In the mode of the PHA, linking to this, the regional public health office (RPHO) especially issues decisions, permits and fulfills further tasks for protecting and supporting public health including state oversight (if the Ministry of Health does not have competence), it fulfills tasks of the involved administrative authority and discusses violations at the section of public health protection (Dudová, 2011). In keeping with the PHA, a legal entity or natural person as the organizer of production of music or as a person who provided a building, other facility or grounds for holding public production of music commits an administrative offense by not ensuring compliance with the public health limit on noise and vibrations (Dudová, 2013). These persons also commit an administrative offense by failing to comply with the obligation to halt operation or use of the source of noise. For such an administrative offense, according to the current (chaotic) diction of the PHA, a fine may be imposed of up to CZK 3,000,000.[23] According to the Offenses Act, for the purposes of public health protection, a person commits this offense by failing to comply with measures determined or imposed to decrease noise and vibrations, but just with the exception of obligations determined for holding or providing space and grounds for public production of music.[24] The existing diction of the law thus became counterintuitive and utterly impractical, because on one hand, it acknowledges administrative punishments, and on the other hand, it rules them out.

Control mechanisms against excessive noise pollution during public production of music outdoors thus no longer have any legal support in terms of protecting human health. If noise de lege lata is no longer considered "noise from production of music operated outdoors", this hereby led to removal of these activities from state health oversight, and for them no public health noise limits are determined. The regional public health office therefore cannot perform measuring or control of such activities, because it would thereby exceed its lawfully mandated authority.

4 Conclusion

It is questionable and short-sighted indeed to assume that one may resolve the given issue only through municipal authority upon issuing generally binding ordinances (see above), referring to the claim that noise from public production of music outdoors mainly concerns short-term and unique expositions (happening a few times a year at a maximum) (Rachel Flowers, Gray, & MacArtur, 2004), and in light of this, it is not even possible for such expositions to determine a health-rational limit, because the relationship between such short-term and unique expositions and direct long-term health effects allegedly does not exist, and that it is possible anyway to apply the existing control and oversight over upholding the requirements of a generally binding ordinance, performed by the municipal police or other authorities stated in the ordinance, etc.[25]

[22] See the provisions of Sec 80(1)(q)–(u), Sec 80(2) of the PHA**.**

[23] Compare the provisions of Sec 92g – 1, 2 in conjunction with the provisions of Sec 84(1)(m) – and the provisions of Sec 92g(8) of the PHA.

[24] Compare the provisions of Sec 29(1)(b) of Act No. 200/1990 Coll., on offenses.

[25] Compare e.g. the website of the RPHO in http://www.khshk.cz/articles.php?article_id=1338

This approach greatly simplifies and meanwhile dangerously belittles the growing problems involved in protecting human health from noise.[26] It moreover ignores the difference in terms of protecting two differing public interests, i.e. the interest in protecting public order (Dudová, 2015) and the interest in protecting public health (Meier, 2010). That is because thee valid legislation pursuant to the PHA is set up so that any public production of music outdoors is no longer subject to any public health limits. It is therefore not ruled out that in a certain locality, it will concern daily, regular or frequently repeated noisy activity, which can result (besides being a "simple nuisance") also in a negative impact on health. Thus, it need not even concern such production falling into a mode by which the municipality would be authorized to resolve it in the form of issuing a generally binding ordinance (e.g. it may concern loud production of music during the day, etc.). It is therefore astounding that if in the CR, the given problem would be removed from control powers of a single control authority and professional oversight in terms of human health protection. Consequently, there definitely lack adequate instruments of satisfaction or instruments of possible negative stimulation in terms of preventing undesirable influences on health regarding excessive public production of music outdoors. Protection of human health was "sidetracked" in contradiction to the proclaimed provisions of the PHA, which should (in accordance with European law[27] and constitutionally guaranteed rights[28]) mainly protect public health.

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[28] See especially Article 31 of the Convention for the Protection of Human Rights and Fundamental Freedoms.

Analysis of Morbidity at a Selected Elementary School of Mainstream Education

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Abstract: The number of hours missed due to illness was selected as the indicator of morbidity. The paper presents the results of the research carried out at a mainstream elementary school.

The main objective of the quantitative research was to monitor the morbidity of primary school students and to compare the sickness of selected groups of students during the first semester of the 2017/2018 school year.

Data for the monitored period were gathered from the school's electronic database, the student' file catalogue sheets, students' notebooks and interviews with class teachers. Categorisation of the sample (569 persons) was done by gender, grade, results, specific educational needs, commuting, physical activity, and obesity. Data were processed anonymously, statistically analyzed in program EpiInfo. The significance of the differences between the groups was verified using selected ANOVA and non-parametric Kruskal-Wallis test.

The transition from junior to senior elementary school, the level of the students' results and whether specific educational needs exist or not are all factors that have a significant impact on student morbidity. Obese students were absent an average of 15.4 days, which is double the overall school average (6.8 days). It was observed that obesity and complications associated with it have a negative impact on student health and morbidity. The exercise and sports activities have a positive impact on health, since those students who were actively participating in sports were absent an average of only 2.5 days.

The research has confirmed that physical activities have a positive impact on health, obesity and its complication negative. It is obvious that the higher morbidity is one of the factors that negatively affects academic performance and marks.

Key words: documentation, reason, illness, sickness, sick note, research, primary school, elementary school, absent lessons, health, student

Health is not only one of the basic conditions of the meaningful existence of every human; it is also of significant social value. A healthy person is the basic prerequisite for the successful economic and social development of society (Čevela, Čeledová, & Dolanský, 2009; MoH CR, 2014).

In general, morbidity is a specialized term that is expressed as a ratio of the number of ill patients to the number of all individuals in the studied group of the population. This is a significant statistical indicator (Hůle, 2018). For the purposes of this research survey, we have chosen several other parameters – the number of absent lessons and absent days due to illness. The procedures for their detection and calculation are described in detail below, in the Methodology section.

A child has *biological needs* (air, water, heat, nutrition, sleep, relaxation, shelter, clothing, and protection against illness and injury), *psychological needs* (quantity and quality of stimuli, emotional and social ties, need for identity, need for open future possibilities), *social needs* (social skills, patterns of behavior, sense of belonging and security, sense of social support, learning how to deal with stressful situations), emotional needs (positive education, acceptance of differences, ability to empathize, experience with good deeds, need for understanding) and *spiritual needs* (need for self-concept and a hierarchy of life values) (Maslow, 2014; Vaníčková, 2005).

School is obliged to provide students with conditions that are favourable for affecting their development and health. We include in these *technical measures* that reduce the risk of accidents (e.g. antiskid surfaces, railings on stairways), *organizational measures* (supervision of the students on the school premises) and an appropriate *physical environment* (adequate classroom capacity, noise reduction, adequate lighting and heating, good ventilation, adequate size of desks and chairs, hygienically suitable washrooms and toilets) (Kotulán, 2005; Machová & Kubátová, 2006).

Some important factors of school life include the observation of a healthy lifestyle, respecting daily biorhythms and attention span, the possibility of physical/motoric activities during breaks, and protection against overloading (especially inappropriate weight of school back-packs. It is also important to protect students from illness/infections, including appropriate temperature in the classrooms, effective ventilation, adherence to proper sanitary habits, support for healthy eating and a proper drinking regime. A child's relation to health is significantly different from that of an adult. Some children tend to be frustrated or overly anxious; others do not admit difficulties and downplay problems; while others still experience shame or embarrassment. Children's health problems need to be treated very carefully and sensitively. In this respect, the role of the educator, especially their attentiveness and empathy is very important, as it is they who see the student regularly and should be able to recognize noticeable difference over time in the child's behavior that might signal the primary symptoms of health problems (Machová & Kubátová, 2006; Mihál, 2003; MoH CR, 2014).

1 Backgrounds

The Czech Republic is among those countries with high quality care for children (0–14 years) and juveniles (15–18 years). There is a well-organized system of preventive examinations that regularly monitor the child's all-round development, including vaccinations. Preventive checks are performed every two years (between the ages of 3 and 15) by a pediatrician, and subsequently at the age of 18. Nevertheless, the morbidity of children and adolescents is relatively high and the number of monitored and treated children is increasing, most often because of respiratory diseases. The number of children and adolescents monitored and treated for obesity and its consequences is alarming. The increase of overweight and obese children was confirmed in many surveys in which the Czech Republic participated (Antošová et al., 2014).

According to the HBSC (International Report on the Health and Lifestyle of Children and School children based on the study of Health-related Behavior in School Aged Children carried out in 2014 with the participation of the Czech Republic, Slovak Republic, Hungary, Ukraine and Poland), the prevalence of the state of being overweight and obese among school children in 2001 was 7.3% for boys and 7.7% for girls. By 2010, these figures rose to 19% and 9% for boys and girls, respectively. The prevalence of the state of being overweight and obese according to IOTF criteria (World Obesity Federation, formerly the International

Obesity Task Force) was 18.9% and 11.4%, respectively, in 2010 (Antošová et al., 2014; Madarasová Gecková et al., 2016).

Obese children are often discriminated against their classmates. In addition to common children's illnesses, various psychosomatic problems resulting in increased absence might also be seen at the junior elementary school level. The legal guardian is fully competent to excuse a child from school during illness. The following most common texts in sick notes excusing children from school include: health reasons, illness, cold, high temperature, doctor's appointment, digestive problems, nausea, vomiting, abdominal pain, headache, limb pain and toothache. Increased absenteeism for any reason is risky for a child and often results in a worsening of their marks. Absence at the beginning of the school year is often underestimated by parents. Absence in September might negatively affect the final study marks, as the curriculum of the previous year is often reviewed in the September introductory lessons and students have the opportunity to "catch up". If the student is absent before the end of the school year when the semester tests are done and marks are finalized, there could be problems resulting in the dissatisfaction of students and parents with the final marks as the teacher does not have sufficient time to determine the final marks. The students with longer and repeated absences have significant difficulties with marks. When they are present in class, they tend to apologize for having to catch up with what has been taught but missed. Teachers usually provide them with a reasonable amount of time to catch up, but they are soon absent again before being retested. In cases of long absences, the final marks may be postponed and a new date for testing can be set, but most parents rely on the fact that the teacher will eventually test the student (Dvořáková, 2006; Machová & Kubátová, 2006).

Various injuries are often the cause of school absenteeism. According to data from the Czech School Inspectorate in 2014, the rate of accidents in schools increased by 16.4% between 2010 and 2014, which is alarming. Most injuries happen during physical education classes or school sports activities. The most risky period for accidents is the beginning and end of the school year. The most risky group in terms of injury are students aged 13–14 (Antošová et al., 2014).

In 2010, a research study was carried out within the framework of the international project "Health Behavior in School-aged Children: WHO Collaborative Cross-National Study (HBSC)". There were 5686 school children from 94 schools in the Czech Republic. A total of 90% of respondents evaluated their health positively, but one-third of 11-year-olds said they had at least two symptoms of health problems at least twice a week. Girls reported more health problems than boys. The 15-year-old girls had the most health problems. The most frequent causes of death of schoolchildren were accidents; girls were less injured than boys; the incidence of boys' injuries increase with age (Kalman et al., 2011).

2 Methods

A frequently used quantitative research method (highly used in pedagogical research) was used in this study (Gavora, 2010). This was a longitudinal (5 months), natural and comprehensive research study that was conducted at a mainstream elementary school attended by a total of 569 students. Data were gathered from the fall semester of the 2017/2018 school year.

3 Objective and research tools

The main objective of the quantitative research was to monitor the morbidity of primary school students and to compare the sickness of selected groups of students during the first semester of the 2017/2018 school year. Absence due to various illnesses was compared according to the following criteria:

- grade (1st to 9th);
- gender (boys, girls);
- marks (passed with honors, passed, failed);
- students with special educational needs;
- obese students;
- students active in various extra-curricular sports;
- commuting students.

The partial aim of the research was to evaluate 4 working hypotheses:

- H_1: The level of morbidity/sickness of junior primary school students is higher than that of senior ones.
- H_2: The sickness of students with worse marks is higher than those with better marks.
- H_3: The sickness of students with special educational needs is higher than that of regular students.
- H_4: The sickness of students commuting to primary school is higher than that of non-commuting students.

The research sample included all students of the selected primary school of the educational mainstream in a town of 10,000 inhabitants. The school staff consisted of 63 members: school head, deputy director, educational counsellor, school preventive methodologist, school psychologist, 30 female teachers, 1 male teacher, 19 teacher assistants and 8 educators for after school activities.

In the fall semester of the 2017/2018 school year, there were 569 students in 26 classes, of which 377 students were in 17 classes in junior elementary school and 192 students were in 9 classes in senior elementary school. More detailed descriptions of the research sample are given in Table 1.

Table 1

Characteristics of the research sample (in absolute terms, by gender and grade)

Grade	Boys	Girls	Total
1.	43	33	76
2.	29	30	59
3.	36	43	79
4.	46	41	87
5.	44	32	76
6.	30	27	57

7.	22	23	45
8.	22	21	43
9.	22	25	47
Total	**294**	**275**	**569**

From the characteristics of the research sample, it is clear that after the 5th grade of junior elementary school, a significant number of students, who have been admitted to secondary grammar school, leave this elementary school. Between the 5th and 6th grades, there is a difference of 19 students (5th grade/76 students; 6th grade/57 students). The boys were more likely to decide for this type of school in the monitored period than the girls. The number of boys decreased by 14, while the number of girls decreased by 5.

Data for the monitored period of the fall semester of the 2017/2018 school year were gathered from the school's electronic database, the student' file catalogue sheets, students' notebooks and interviews with class teachers. For each student, the absent lessons were deducted mainly because of family holidays, as in these cases the student's legal guardian is required to ask the school authority (headmaster) in advance in writing. Both the legal guardian's request and the headmaster's decision about the absence must be included in the student's file, so it may be tracked and the student's absences deducted. If the students do not attend school due to extra-curricular representation of the school (e.g. olympics, competitions, sports tournaments, academy, participation in school charity events), these absent lessons are not counted in the total. In order to obtain the most accurate data, absent lessons/hours due to family issues that are recorded in the student's notebooks are also deducted. We cannot rule out cases where some students did not attend school for family reasons, although their parents excused their children for illness. When collecting data, this fact cannot be influenced, as the student's legal guardian is fully responsible for excusing their child. During the monitored period, there were no unexcused lessons, or truancy. The acquired data were processed anonymously, recorded in an MS Excel 2007 spreadsheet and transferred to the statistical program EpiInfo, version 6.02 En (Dean et al., 1994). Tables of the absolute frequencies of individual students were obtained, sorting of selected groups by year, gender, marks, etc. The significance of the differences between the groups was verified using selected ANOVA and non-parametric Kruskal-Wallis test.

4 Results

An overview of student absence due to illness is shown in the tables and charts in absolute terms. The hours missed are converted into days because the weekly number of classes is different in various grades. The tables and charts include a brief commentary.

Table 2

Number of lessons per week (in absolute terms, by grade) and average number of lessons per day

Grade	Number of classes per week	Average number of classes per day
1	21	4.2
2	22	4.4
3	25	5.0
4	25	5.0
5	25	5.0
6	30	6.0
7	30	6.0
8	31	6.2
9	31	6.2

Table 2 shows the weekly number of classes and the average daily number of classes according to grades. In the 1st grade of the mainstream school, the students have 4 lessons on 4 days and 5 lessons on 1 day (i.e. 21 lessons per week). In the 2nd grade they have 5 lessons on 2 days, in addition to 4 lessons on 3 days (i.e. 22 hours a week). In the 3rd grade they have 5 lessons on 5 days, for a total of 25 lessons a week; this is when they start learning a foreign language three times a week. A significant increase of lessons, up to 30 lessons, occurs in the 6th grade, when some new subjects are introduced (i.e. physics, information technology, civic education and health). The final increase to 31 lessons occurs when the compulsory second language is introduced. At this particular elementary school, the students can choose German or Russian.

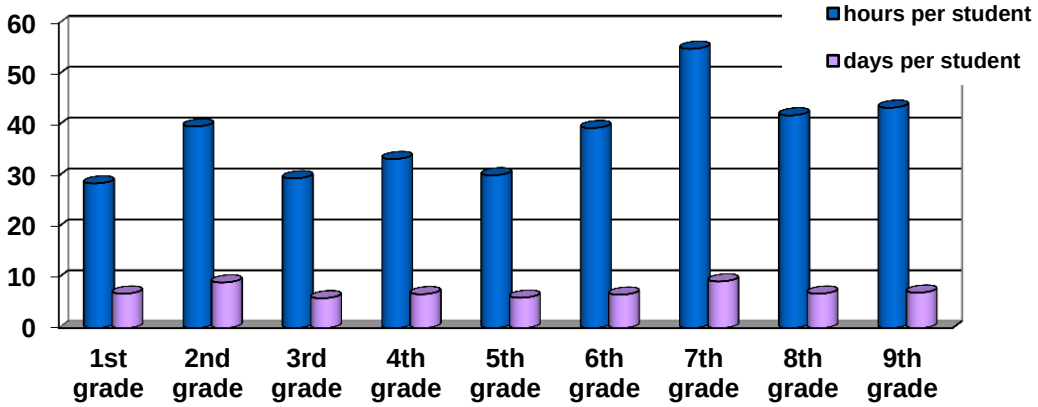
Table 3

Indicators of student sickness by grade

Grade	Number of students	Number of missed hours in the grade/Year	Average of hours missed per student	Average of absent days per student
1	76	2,163	28.5	6.8
2	59	2,345	39.7	9.0
3	79	2,329	29.5	5.9
4	87	2,896	33.3	6.7

5	76	2,284	30.1	6.0
6	57	2,245	39.4	6.6
7	45	2,477	55.0	9.2
8	43	1,802	41.9	6.8
9	47	2,038	43.4	7.0

5 Average number of absent lessons/classes by grade



Graph 1. Sickness of elementary school students by grade.

Table 3 and Graph 1 show that the absence of elementary school students due to illness is not very high. It ranges from 5.9 to 9.2 days per student for the entire semester. The lowest morbidity is evident in the 3rd grade (5.9 days per student) and in the 5th grade (6.0 days per student), which theoretically may be related to the amount and difficulty of the new curriculum. From the point of view of the curriculum, both these grades are considered more demanding than the other grades of junior elementary school. The 3rd grade is demanding due to the first foreign language (English), which for some students, especially dyslexics, is a great burden. Catching up with English language lessons is a difficult task for those students whose parents do not speak the language; therefore, they do not want their children to be absent for those particular lessons.

The 5th grade offers the possibility of transition to multi-year grammar school. We can see great effort to study and obtain better marks in those students who are preparing for the entrance examinations; therefore, they attempt to minimize the number of absent lessons/hours.

The highest absence was recorded in the 2nd grade of primary school (9.0 days per student) and in the 7th grade (9.2 days per student), which is probably related to the school sports activities within Physical Education. In the fall semester of the 2nd grade from October to December, the students have one hour of swimming lessons weekly. In this period, morbidity has increased every year, with this research confirming this fact. In the 7th grade from

December to February, the school organizes optional weekly ski and snowboard lessons, which are quite popular and attract many students. However, upon return from the course, the student morbidity usually increases.

Table 4

Comparison of student sickness – Junior and senior elementary school (in absolute terms)

Junior and senior primary school	Total number of hours missed	Average number of hours missed per student	Average number of absent days per student
1	12,017	31.9	6.8
2	8,562	44.6	7.3

It is clear from Table 4 that the number of absent days of junior and senior elementary school students is not significantly different, although the junior students' morbidity is surprisingly slightly higher. Junior students were absent an average of 6.8 days during the first semester, while junior students were absent 7.3 days. The sickness of juniors might be affected by the fact that they start moving in larger teams and expand their circle of friends. This elementary school offers junior students a wide range of popular afternoon leisure activities. However, in different teams, the students might catch new microbes that their body has not yet developed immunity for.

The more frequent sickness of older students is related to adolescence. At this age, the body grows more rapidly and gets stronger, needs more energy, needs enough sleep and undergoes demanding changes. The overall changes in the body are also related to the production of sex hormones. Some diseases (such as skin and mucosal inflammation) are transmitted by close physical contact, which becomes more frequent at this age.

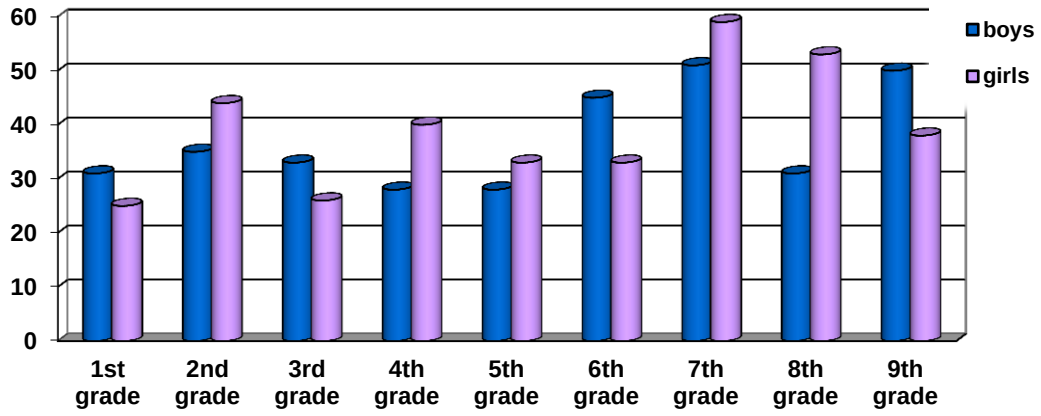
Another cause of higher morbidity in senior students may be inadequate hygiene habits, which are reminded by teachers and parents less frequently and less thoroughly. According to the research carried out in 2016 (Lebedová, 2017), it is clear that many students did not thoroughly follow basic hygiene principles/rules. After visiting the toilets, 51% of the students had not washed their hands. Before eating, only 61% of students washed their hands and 65% of students occasionally drank from a bottle shared with a classmate. All of these factors are risky and certainly affect student morbidity.

Table 5

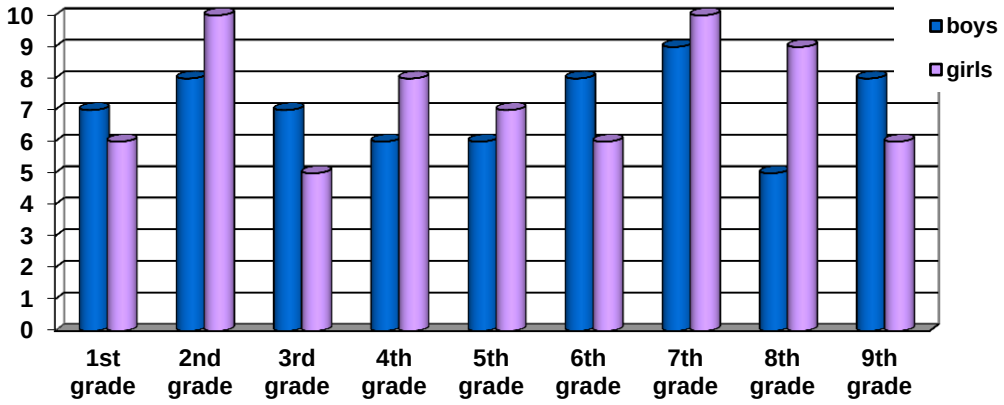
Indicators of morbidity of elementary school students sorted by gender and grade (in absolute terms)

Grade	Number of boys	Number of girls	Average number of hours missed in boys	Average number of hours missed in girls	Average number of absent days in boys	Average number of absent days in girls
1	43	33	31	25	7	6

2	29	30	35	44	8	10
3	36	43	33	26	7	5
4	46	41	28	40	6	8
5	44	32	28	33	6	7
6	30	27	45	33	8	6
7	22	23	51	59	9	10
8	22	21	31	53	5	9
9	22	25	50	38	8	6



Graph 2a. Morbidity of elementary school students sorted by gender and grade (in absolute terms), hours per student.



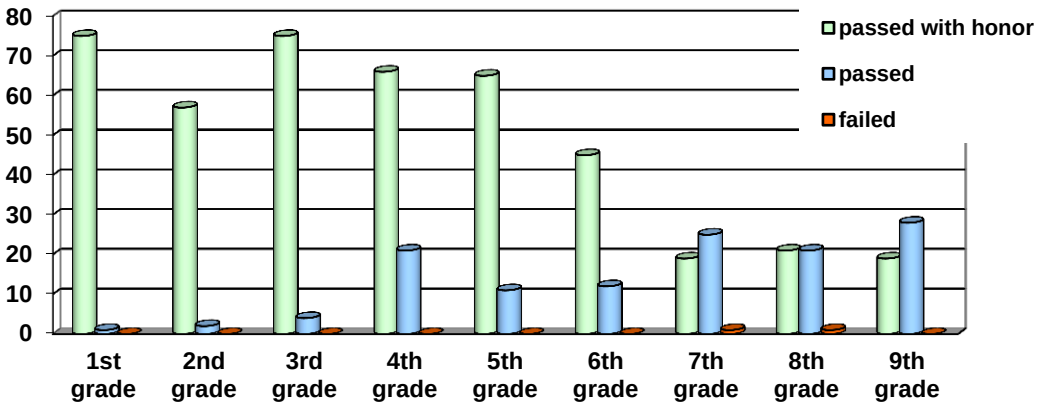
Graph 2b. Morbidity of elementary school students sorted by gender and grade (in absolute terms), days per student.

According to Table 5 and Graphs 2a and 2b there are significant differences in male and female morbidity. In five grades (2nd, 4th, 5th, 7th and 8th), there is higher morbidity for girls, while in four different years (1st, 3rd, 6th and 9th), there is higher morbidity for boys. The most striking difference was recorded in senior students in the 8th grade – the morbidity for girls in the first half was 9 days, whereas in boys only 5 days. In other grades, differences in morbidity were not so significant, ranging from 1 to 2 days.

Table 6

Structure of elementary school students by grade and results (in absolute terms)

Grade	Total number of students	Students with excellent results	Students who passed	Failed students
1	76	75	1	0
2	59	57	2	0
3	79	75	4	0
4	87	66	21	0
5	76	65	11	0
6	57	45	12	0
7	45	19	25	1
8	43	21	21	1
9	47	19	28	0



Graph 3. Structure of elementary school students by grade and results (in absolute terms).

Table 6 and Graph 3 show that 442 students passed with honors, 125 passed and 2 failed. A student with honors must have a total average mark of up to 1.5 from all the subjects; however, the average does not include the behavior mark. The students must not get a mark worse than 2 in any subject. At junior school there was a significantly higher number of excellent students than at senior school; however, in the 4th and 5th grades, their number decreased. In junior school, there was no failed student. In the 6th grade, there were 45 students with honors and 12 students who passed. The number of students with honors still exceeded those without, but from the 7th grade, it began to decline. In the 8th grade, there was an even number of students with honors and those who passed (21 students in each group). The 7th and 9th grade students had the worst study results – there were the lowest number of excellent students (19 out of 45 students in the 7th grade, and 19 out of 47 students in the 9th grade). In the fall semester, 2 students failed: one in the 7th grade and the other in the 8th.

Table 7

Parameters of student sickness/absence according to their marks/performance

Marks/Results	Number of students	Average number of hours missed per student	Average number of absent days per student
Passed with honor	442	31.5	5.9
Passes	125	51.1	9.6
Failed	2	133.5	21.9

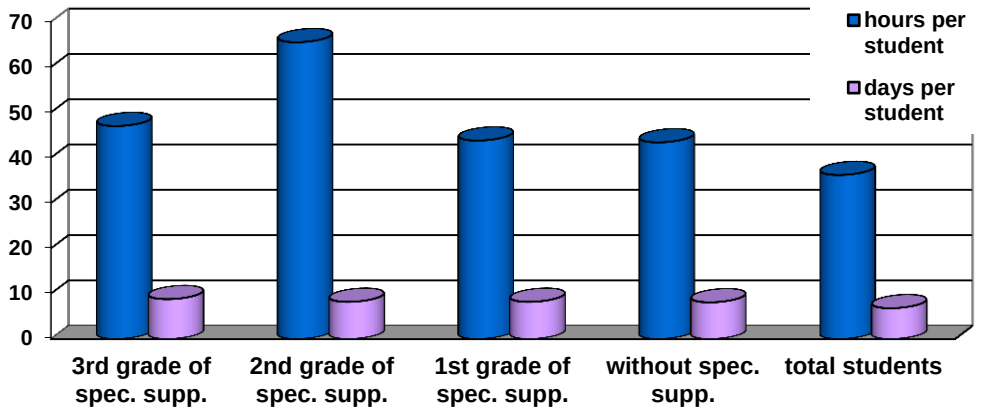
Table 7 shows that the excellent students (442 students) were on average 5.9 days absent in the first semester due to illness. The good students (125 students) were absent 3.7 days more, (i.e. 9.6 days), which does not represent a significant difference. The failed students (2 students) were absent on an average of 21.9 days, which represents a significant increase. According to the research results, it is obvious that the increased student sickness/absence is one of the important factors that negatively affects the study results. Excellent students feel more comfortable at school, are praised for their study results, experience a sense of success and satisfaction, all of which positively affect their mental and physical health.

Table 8

Parameters of students with special educational needs

Level of support measures	Number of students	Average number of hours missed per student	Average number of absent days per student
3rd level of support measures	21	47.0	8.8
2nd level of support measures	24	65.5	8.2

1st level of support measures	16	43.8	8.2
Without support measures, in the care of counsellors	38	43.4	8.1
Total students	569	36.2	6.8



Graph 4. Morbidity of students with special educational needs.

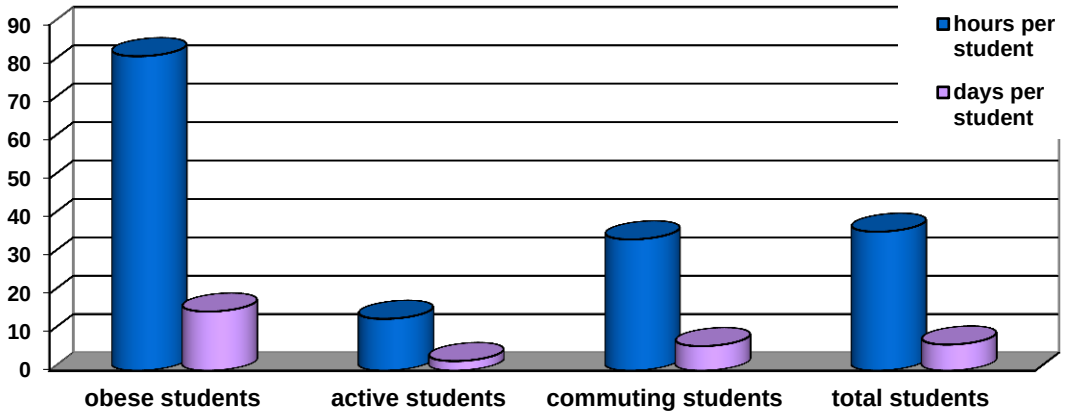
Table 8 shows that in the fall semester of the 2017/2018 school year, a total of 569 students attended the elementary school, of which 21 students were at the 3rd degree of special support, 24 students were at the 2nd degree and 16 students were at the 1st degree of special support. These are students diagnosed with conditions such as autism, LMP – light mental disorder, ADHD, ADD, epilepsy, dyslexia, dysortographia, dysgraphia, dyscalculia, dyspraxia, physical disability, or developmental dysphasia. Another 38 students underwent examinations in special pedagogical-psychological counselling institutions. These students have some difficulties in learning, but only in a very mild form, so they can be taught without any major support. These include students with moderate visual impairment or auditory differentiation, speech defects, crossed laterality, increased fatigue/tiredness and fluctuating work pace.

From the research results (see Graph 4), it is clear that most students with the above-mentioned main diagnoses also suffer from other health problems that cause higher morbidity. Compared to regular students, the students with support have higher morbidity; however, their absence remains within the standard. In the first semester, the total average was 6.8 absent days per student. Students with the 1st and 2nd grade of support were absent 8.2 days; the students with the 3rd grade of support were absent an average of 8.8 days. Based on the survey, it can be concluded that the higher grade of support, the higher the number of absent days, hence the higher morbidity.

Table 9

Comparison of the morbidity parameters of elementary school students, sorted by obesity, sporting activity and commuting

Group of students	Number of students	Average number of hours missed per student	Average number of absent days per student
Obese students	11	81.9	15.4
Students active in sports	137	13.5	2.5
Commuting students	17	34.2	6.4
Total number of students	569	36.2	6.8



Graph 5. The morbidity (absence due to sickness) of elementary school students comparing different groups of students – those who are obese, active students and commuting students.

In Table 9 and Graph 5 the average absence due to sickness was compared in three groups of students: obese, active and commuting students (In the given semester, 11 obese students attended the elementary school, 9 junior and 2 senior students. Obese students were absent for an average of 15.4 days, which is more than double the average 6.8 days per student. The research has confirmed that obesity has a negative impact on health as early as junior elementary school and causes higher morbidity.

Another monitored group were the 137 students active in sports – those who in their free time do various sports activities or have regular training. It is obvious that regular exercise and sports activities positively affect their health, because in the first semester they were absent for an average of only 2.5 days. Compared with the average absenteeism of all the students, which reached 6.8 absent days, this result clearly indicates that sport has a positive effect on human health from and early age.

The last monitored group were 17 commuting students. This group is very heterogeneous. Some students live in the town of Kuřim, others temporarily or permanently live outside of Kuřim, and others have permanent residence in the near vicinity, but for various reasons do not attend school near their home. The number of absent days for commuting students

(6.4 days) is almost the same as the average of all students (6.8 days). We can conclude that regular commuting to school basically does not affect student morbidity.

6 Analysis of working hypotheses

Working hypothesis H_1: *The absence due to sickness of junior school students is higher than that of senior school students.*

The Kruskal-Wallis nonparametric test was used to compare both groups (Kruskal-Wallis $H = 19.28$, $p < 0.001$). In the morbidity of junior and senior school students, a statistically significant difference to a level of more than 1% has been found.

Junior students in the first semester were absent for an average of 6.8 days, whereas senior students were absent for 7.3 days (see Table 4). The analysis of the H1 hypothesis showed that junior absence due to sickness is not higher than that of senior students, but rather the contrary is true. The H_1 hypothesis was thus falsified, as the junior student morbidity is lower than that of the senior students.

Working hypothesis H_2: *Morbidity of failing students is higher than that of excellent students.*

The Kruskal-Wallis nonparametric test was used to compare these groups. In the case of excellent and good students, Kruskal-Wallis showed that $H = 22.94$, $p < 0.001$; the difference in their morbidity is therefore considered to be significant at a level of better than 1%. When compared to students with honours or those who failed, Kruskal-Wallis shows $H = 4.29$ and $p < 0.05$, thus the difference in their morbidity is significant at a level of 5%. When analysing the morbidity of passed verseus failed students, a somewhat significant difference was found at the level of 5% (ANOVA, $F = 6.57$, $p < 0.05$).

Excellent students on average were absent 5.9 days for sickness, good students were absent for 3.7 days more, that is, 9.6 days. Failed students were absent for an average of 21.9 days, which represents a significant difference (see Table 6 and Graph). An analysis of the H_2 hypothesis shows that performance at school and student grades (results) affect morbidity. The H_2 hypothesis has been verified.

Working hypothesis H3: *Morbidity of students with special educational needs is higher than the morbidity of regular students.*

The Kruskal-Wallis nonparametric test was used to compare these groups (Kruskal-Wallis $H = 2.64$, $p > 0.05$); the difference in their morbidity is then evaluated statistically unimportant.

In the fall semester, the total number of absent days was 6.8 per student. Those with the 1st and 2nd levels of support were absent the same number of days – 8.2; students with the 3rd level were absent for an average of 8.8 days (see Table 8 and Graph 4). From the research results, we can say that a higher degree of support corresponds to a higher number of absent days, thus higher morbidity. From the analyses of the H_3 hypothesis, we can conclude that the morbidity of students with special educational needs is higher than that of the regular students, not significantly, when considering students with all levels of support, including those students with the counsellors' care. It would be statistically significant to compare

morbidity of the students with the highest level of support and the rest of the group. The H_3 hypothesis was falsified.

> ***Working hypothesis H_4:*** *Morbidity of commuting students to elementary school is higher than those who live near their school.*

The Kruskal-Wallis non-parametric test was used to compare these groups (Kruskal-Wallis $H = 0.28$, $p > 0.05$); the difference in their morbidity is statistically insignificant.

In the fall semester, the total average of absent days was 6.8 per student. The average for the commuting students was 6.4 days, which is 0.4 day less (see Table 9 and Graph 5). The analysis of the H_4 hypothesis shows that the morbidity of commuting students is actually lower than those students who live near school; thus the H_4 hypothesis was falsified.

7 Summary and discussion

The processed data have produced interesting results showing that morbidity at the elementary school is not very high. Generally, it ranges from 5.9 to 9.2 days per student per semester.

From the point of view of individual grades, the lowest absences due to sickness were recorded in the 3rd grade (5.9 days per student) and 5th grades (6.0 days per student). On the contrary, the highest absence was recorded in the senior school (9.0 days per student), especially the 7th grade (9.2 days per student).

The number of absent days between junior and senior students differed only slightly. The junior's student morbidity was surprisingly lower than the senior's. The junior student was absent an average of 6.8 days; the senior student 7.3.

Significant differences were observed in the morbidity of boys and girls. In five grades (2nd, 4th, 5th, 7th and 8th grade), there was higher morbidity for girls, while in four grades (1st, 3rd, 6th and 9th), there was higher morbidity for boys. The most striking difference was recorded in senior school in the 8th grade, where the girls' morbidity was 9 days, but only 5 days for boys. In other grades the differences in morbidity ranged from 1 to 2 days.

In regards to performance, students with honors were absent an average of 5.9 days due to illness, which is 3.7 days less than the students who merely passed, who were absent 9.6 days. The absence of failed students was much higher at 21.9 days. From the results, it is obvious that the higher morbidity is one of the factors that negatively affects academic performance and marks.

The absence due to sickness of students with special education support is higher compared to that of regular students. Students with the 1st and 2nd degree of support measures were both absent for 8.2 days. Students with the 3rd degree of support were absent an average of 8.8 days. It can be said that a higher level of support corresponds to higher morbidity.

Obese students were absent an average of 15.4 days, which is double the overall school average (6.8 days), confirming that obesity and complications associated with it have a negative impact on student health and morbidity.

The research has confirmed that exercise and sports activities have a positive impact on health, since those students who were actively participating in sports were absent an average of only 2.5 days.

The last monitored group was commuting students, who were absent an average of 6.4 days. Their absence is almost identical to the overall school average of absences (6.8 days). We can conclude that regular commuting to school does not affect student morbidity.

8 Conclusion

Health is a value that must not only be discussed but also actively dealt with. It is necessary to monitor the health status and morbidity of the population as a whole, then to define the risk groups and pay more attention to them.

Morbidity is a basic indicator of the health of the population. Patient statistics are provided in the Czech Republic by the Institute of Health Information and Statistics of the Czech Republic (IHIS CR), which collects data from many sources within the National Health Information System (NHIS). NHIS includes data not only from the Program of Statistical Surveys of the Ministry of Health of the Czech Republic and National Health Registers, but from many other departmental systems as well. Childhood and adolescence are stages of human life when each individual undergoes pronounced physical and mental development, acquires knowledge, skills, social and health habits that are retained throughout the person's life. When society invests in the protection and support of children's health, there is likely to be a long-term effect that can impact their level of health even in adulthood.

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Opinions of Secondary School Students on Vegetarianism

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Abstract: Vegetarianism is the most widespread type of alternative nutrition worldwide and in the Czech Republic as well.

The main objective of the survey was to identify the opinions/attitudes of secondary school students on vegetarians and to vegetarianism. The partial objective of the research was to analyze data obtained and to compare it to similar studies.

Using an anonymous standardized questionnaire ATVS consisting of 33 statements on vegetarians, intentionally sample of 311 respondents – students from 4 secondary schools in a small town of Kyjov in the Czech Republic was addressed. The chi-square test and its modification according to Yates and Mantel-Haenszel were used to analyze differences among groups.

Generally positive comments prevailed. Girls tended to be more positive and more tolerant to vegetarians than boys; girls were more tolerant to this lifestyle and less prejudiced. Attitudes in the group of younger and older students did not differ significantly. When comparing attitudes by different types of schools, the most positive and tolerant attitudes were the students from the grammar school and the nursing school. The students from two vocational schools were more negative and more prejudiced to the vegetarians.

The most positive and tolerant attitudes were held by the grammar school students. These results also illustrate established hypotheses, of which it is clear after testing that girls show more positive relationships with vegetarians than boys.

Key words: ATVS, questionnaire, opinion, attitude, secondary school, vegetarianism, research, health, student

Nutrition significantly affects our lives and reflects our health (Sharon, 2006). It is one of the most important factors in the external environment that affects the development and health of a person, even before his or her birth. It is also an important factor in the development and prevention of diseases (Marádová, 2010).

Nutrition plays a primary role in the development of many diseases that are often the cause of serious health complications or even deaths, particularly cardiovascular and cancer diseases, osteoporosis, obesity and diabetes. This is evident for example in the so-called *Chinese study* – the biggest dietary study studying the relationship between diet and health. The research was conducted by Cornell University and supported by the National Institutes of Health, the American Cancer Society and the American Cancer Research Institute. The *Chinese study* started in the early 1980s and was active for 30 years, during which a diet and health status of 6,500 people was monitored and studied. The evaluation of the data is still ongoing – more than 8,000 significant relationships between diet and other lifestyle components on one hand and health status on the other hand have been discovered. An important link has been discovered primarily between excessive consumption of food of animal origin and the emergence of cancerous and cardiovascular diseases.

From the results of the *Chinese study* it is clear that a higher proportion of food of plant origin and active lifestyle maintain and strengthen health (Campbell & Campbell, 2017). Improper nutrition is a major cause of obesity, which is officially recognized by the WHO as a disease which spreads epidemically mainly in highly developed countries (Klescht, 2008). Properly designed diet should provide the human organism with conditions for optimal growth and development, maximum physical and psychological performance, maximum ability to defend against external and internal risk factors, maximum reproductive capacity and avoid unwanted signs of aging (Marádová, 2010).

Alternative Nutrition Directions

The term "alternative nutrition" does not have a precise definition. It is most often explained as a practical application of options that are not customary or officially recognized. The expansion of alternative medicine and health approaches brings a variety of alternative forms of nutrition, and their popularity increases among people. There is also a rise in the number of research that focuses on these issues, as it is necessary to find out and verify whether alternative diets are nutritionally balanced, scientifically based and bring health benefits or risks (Komárek et al., 2004).

Alternate nutritional trends include vegetarianism with all its forms (detailed below), divided diet, paleo diet, blood group diet, nutrition according to five elements according to the teachings of traditional Chinese medicine, Ayurveda, organic diet and others (Kasper, 2015).

Vegetarianism and its forms

Vegetarianism is the most widespread type of alternative nutrition worldwide and in the Czech Republic as well (Komárek et al., 2004). We usually speak about vegetarian as a person rejecting certain foods of animal origin, usually meat and products obtained from the animal slaughter. There are many variants of vegetarian diets. Vegans and lacto-vegetarians are considered to be two basic ones (Davisová & Melinová, 2009).

Veganism is the strictest form of vegetarianism. Vegans refuse to eat all animal products (not only meat and products from slaughter, dairy products, milk, dairy products and eggs, but even honey), they mostly do not eat products of animal origin, they refuse garments from genuine leather, wool and silk, cosmetics containing ingredients of animal origin or tested on animals (Davisová & Melinová, 2009). Vegans also do not usually accept anything that is not natural to animals, especially their commercial abuse in circuses, inconvenient breeding stations, etc. Therefore veganism is considered not only as a part of nutrition, but also as lifestyle and philosophy. There is also a so-called form "catering/eating veganism", when people eat vegan way, but they do not reject the use of animal products in everyday life (Jiříková, 2014). For its rigidity, but also thanks to the fact that it is the most common diet, veganism is very controversial and among nutritionists is the most researched and discussed type of plant diet (Brazier, 2014).

Lacto-vegetarianism is a nutritional direction with the highest number of European and American supporters. This term originated as a composite of the Latin words *lacto* (milk) and *ovo* (egg). Lacto-ovovegetarians basically refuse meat and products from slaughter, but generally eat dairy products and eggs (Klescht, 2008). Lacto-vegetarians subgroups are lacto-vegetarians (they consume milk and dairy products, but not eggs) and ovo-vegetarians (do not consume milk and dairy products but eat eggs). There are not many strict followers of these groups because most vegetarians consume both (Kahleová et al., 2013).

These two basic types are further subdivided into subtypes that combine vegetarianism, veganism with other rules (Kasper, 2015):

- Fruitarians – a strict form of vegans, it is allowed to consume only those parts of plants which are not damaged when harvest them, (fruits, nuts, fruit vegetables, cereals, and legumes) root, onion and leafy vegetables and potatoes are not allowed.
- Su-vegetarians – a diet with a vegan base, which excludes all animal products and also certain vegetables, namely highly aromatic species of vegetables (onions, garlic, leeks, etc.).
- Vitarians (also referred to as raw or raw food) – a vegan type of eating, the food is consumed in a raw state; the emphasis is placed on the way food is prepared, where the used temperature does not exceed 47 °C.
- Semi-vegetarianism (demi vegetarianism, also partial vegetarianism) is milder form of vegetarianism, only a specific type of meat is excluded from the diet, or the meat is consumed in a very limited amount:
    - Pollotarianism – a relatively common type with the exclusion of meat from all mammals and fish, other types of meat (e.g. poultry) are allowed.
    - Pesceatarianism – meat is almost non-consuming, with the exception of fish and sea animals.
    - Pesce-pollo-vegetarianism – only mammal meat is forbidden.
    - Flexitarianism – it is possible to consume all types of meat and animal products, but only in very limited quantities.

A special type of nutrition derived from vegetarianism is macrobiotic food (macrobiotics) based on Chinese zen-buddhism (Kasper, 2015). It is predominantly herbal diet advocating return to the original way of living. The most common are cereals (paddy rice), selected types of vegetables, legumes and other crops. Foods of animal origin are not forbidden but are only recommended in limited quantities; fish, seafood and poultry are preferred (Komárek et al., 2004).

History of vegetarianism

Vegetarianism has been around for a long time. In the past there were many cultures that consumed vegetarian meals, even where vegetarianism was not common, had its followers mostly among scholars, philosophers, and clergy. Some vegetarian-oriented cultures have disappeared, others have survived. At present vegetarianism as a trend is growing again (Pavlíčková, 2017).

The origin of the term *vegetarian* is not clear. According to one opinion, the *vegetabilis* (plant) or *vegetare* (growth, development), or vegetare (growth, development), according to another it is more likely to originate from the Latin vegetus (fresh, lively, healthy but also living, living) (ČSVV, 2017; Risi & Zürrer, 2007).

The caveman is traditionally seen as a hunter, a predominant carnivore. However, collected fruits represented a much larger share in their diet, and the men equally participated in the fruit collection. Cave paintings with hunting scenes prove that hunting played a significant role and also exceptional opportunity, but it was not a routine (Wood, 2008).

The oldest surviving document on vegetarianism (fruitarianism) is probably the Bible (Collective, 2009). However, later there has been a shift away from this tradition, and today's Christianity is no longer too close to vegetarianism (ČSVV, 2017).

After the Bible, an ancient Vedic culture active between 1500 and 500 BC in India (ČSVV, 2017), is the second oldest user of vegetarianism. India is considered to be the cradle of modern vegetarianism which is associated with non-violent access to food provision and preparation. Not all religious directions in India are vegetarian, yoga followers are convinced vegetarians (Pavlíčková, 2017). At the time of colonization of India by Great Britain vegetarianism was common in higher social classes, from which it penetrated into the British social circles, whose members brought it to the UK, and vegetarianism spread further to Europe (ČSVV, 2017). Outside India it was possible to see vegetarianism especially in Persia (nowadays Iran), where the philosopher and religious reformer Zarathustra denied violence, bloody animal sacrifices and orgies associated with drug use (Pavlíčková, 2017).

In ancient Europe vegetarianism was common in Greece and Rome and was followed by small groups of people. Those vegetarians were mostly philosophers, their diet reflected their views. They did not consume meat mainly for ethical reasons – they rejected ritual animal sacrifices, animal violence, sought for harmony in human relationship and in relation with the nature. In the area of their religious belief the idea of moving souls prevailed (Pavlíčková, 2017). Probably the most well-known vegetarian was the Greek philosopher and mathematician Pythagoras, who around 540 BC in the southern Italy founded his own school – according to some people, even a sect (Pavlíčková, 2017). Its proponents – the Pythagoreans – have advocated the doctrine of soul migration, which was the reason for meat rejection (Chlubný & Svobodová, 2004). The gladiators were also vegetarians. Their typical diet consisted of wheat, barley and beans. To heal their wounds and regenerate their body, they drunk a special beverage made from plant ashes – which is a sort of analogy of today's popular smoothie. With the rise and spread of Christianity in the Roman Empire vegetarianism gradually began to decline. Some Christian clergymen avoided meat but in most cases it was not ethic question, but there were ascetic reasons – a request for modesty or a fear of ritual dirt. In Europe the ethical concept of vegetarianism is again significant in the Renaissance and Humanism in the 16th century, and again, it was educated people who were the first supporters (Pavlíčková, 2017).

Most of the indigenous Natives were to some degree or even full vegetarians. The original Natives feed on plant food and they grew many crops on fertile soil. After the arrival of the Europeans and the beginning of the colonization at the end of the 15th century they were gradually kicked out to inhospitable areas, where the only way of survival was animal hunting and the consumption of meat. The farmers and fruit collectors turned to bison hunters (Pavlíčková, 2017).

In 1847 in Manchester the first British vegetarian company came to being which made the vegetarian style and the name "vegetarian" popular. At the beginning of the 20th century the International Vegetarian Union was founded. It is an organization that promotes vegetarianism as a lifestyle. The vegetarian concept subsequently developed rapidly in the western world (Risi & Zürrer, 2007).

Nowadays vegetarianism is the lifestyle of millions of people all over the world. A number of prominent personalities from philosophers, actors, writers, scientists, politicians and owners of large companies (e.g. da Vinci, Socrates, Rousseau, Schopenhauer, Tolstoy, Shaw, Kafka, Ford, Einstein, Gandhi, Goodall, Jobs, Pitt, di Caprio, McCartney and many others) adopted this style (Soucitně.cz, 2017).

In the Czech Republic the history of vegetarianism is considerably shorter. In the first half of the 19th century vegetarian food was used as one method of the treatments, however, there were disputes over its benefits. In the second half of the 19th century vegetarianism gained popularity and was promoted mainly by higher social classes. The first vegetarian restaurants

and specialized shops were established and the first Czech vegetarian cookbooks were published. In 1929, a Czechoslovak Vegetarian Club was founded in Prague, which ceased its operation in 1939 due to the Protectorate legislation. During the World War II the vegetarians joined the Abstinent Society which was allowed and after the World War II a Czechoslovak Vegetarian Society was founded, however, after political changes in 1948 ended its activity. Vegetarianism gradually become less popular, the comeback or Renaissance came in the late 1980s (Pavlíčková, 2007).

Vegetarianism – current situation

Currently around one billion of vegetarians live in the world. Their highest representation (about one fifth) is concentrated in India where vegetarian tradition is rooted and strongly supported by religion. In the Czech Republic about 2% of the population eats vegetarian food, but their numbers are constantly growing. The Czech Republic follows the trend of the developed western countries – vegetarians represent approximately 10%, vegetarian population in the USA is about 4% (Vegetariáni.cz, 2017; Volráb, 2005).

Attitude to vegetarianism as a nutritional style is still somehow negative in the Czech Republic; it is a topic of many professionals and ordinary people. In addition to misinterpretation and concerns of the general public, active vegetarians and people who are considering becoming vegetarians often encounter "expert counter-arguments". Most doctors are very skeptical about vegetarianism, many doctors even warn people against vegetarianism even though they do not have proper knowledge of nutrition themselves, and their opinions have no support in the research. It is more about presenting their own ideas and beliefs. The scientific studies of the University of Giessen, the Cancer Research Center in Heidelberg and the Federal Health Office in Berlin have consistently been showing that vegetarians have excellent laboratory test results and reduced susceptibility to illness (Hartinger, 2007). The lack of some micronutrients is similar in vegetarians and non-vegetarians (Risi & Zürrer, 2007). According to Kasper (2015), appropriately designed lacto-vegetarian diet can more easily provide preventive recommendations than a commonly-used mixed diet.

Beside already mentioned so-*called Chinese study*, (Campbell & Campbell, 2017), *EPIC-PANACEA* (Norat et al., 2010) proves favor of vegetarian diets. This is an extensive study on body weight that concludes that eating meat with the same amount of energy produces the largest amount of body fat compared to other sources. Similarly the study by *The Nurses' Health Study and the Health Professionals Follow-up Study* (Fung et al., 2010) demonstrated a direct relationship between diet with high animal protein content and mortality due to cardiovascular diseases. Also the conclusion of the research on cancer risk factors A *multicounty ecological study on Cancer Incidence Rates in 2008* (Grant, 2014) has shown that excessive meat consumption promotes the onset and development of cancer.

Despite these findings people have prejudice against vegetarians, every health problem is immediately associated with their eating habits, while those who accept conventional food – the same problems are considered to be natural or a result of other causes. European highly developed countries and the US have a completely different approach: vegetarianism is seen as part of a healthy lifestyle but also as a possible way to address the current issue of human and environmental survival (Škvařil, 2003).

For most people the main reason for the transition to vegetarianism and its belief are ethical and moral principles (Risi & Zürrer, 2007). Killing an animal is only acceptable for ethical vegetarians in extreme cases where meat consumption is not only because of enjoyment and

nutritional value. There is also a difference in attitudes to drinking milk and eating eggs. Vegans reject consumption

of those because their production causes animal suffering or premature death, and vegetarians can solve this conflict by using organic products (biomedicine, bioveducts) and vegetarian options of individual dishes (Riggová, 2012).

Most vegetarianism is promoted in Buddhism because most believers are convinced of soul reincarnation. It is not required in all its branches, but it is strictly respected by Buddhist monks and janists (Volráb, 2005). The eating habits also vary depending on the caste system. While the top caste members are strict vegetarians who do not consume either fish or eggs, the lowest caste can consume any type of meat (Štěpánová, 2012). In modern Christianity there are no special rules for eating, attitude to vegetarianism is neutral – people are not discouraged, neither encouraged or dissuaded. An exception are small Christian groups that vegetarianism generally practice, e.g. the Seventh-day Adventist Church (Volráb, 2005). Judaism does not forbid the Jews to eat meat, it sets strict regulations for the type of meat and its preparation which must be so called kosher (Štěpánová, 2012). Islamic states allow consumption of meat, except of pork. But some followers of some branches of Islam are ethical vegetarians (Risi & Zürrer, 2007).

Many people turn to vegetarianism for environmental reasons. Over the past 50 years meat consumption has grown four times worldwide, poultry even ten times a year, about 60 billion animals are fed and slaughtered annually. Decrease of meat consumption has a beneficial effect to the quality of environment. It is about reduction of the impact of the meat industry on climate change by reducing greenhouse gas emissions, especially carbon dioxide escaping during forest clearing to get the pastures and feed production, methane from the gastrointestinal tract of cattle and nitrous oxide from fertilizers (Riggová, 2012; Steinfeld, 2006).

Another incentive for vegetarianism is food efficiency. In developing countries a person consumes wheat (about 200 kg per year) directly, in developed European countries and America it is five times more, mostly indirectly – to feed the animals. Decrease of meat consumption would help to free up the cropping capacity to produce wheat and feed so many hungry people (Risi & Zürrer, 2007).

Also livestock requires a huge amount of water (e.g. 2.4 m^3 is needed to produce and prepare the beef hamburger), which is becoming scare all over the world (Riggová, 2012). An important economic reason is the fact that the price of a plant food is usually lower than that of a meat diet. Transition to vegetarianism or at least reduction of meat is also a possibility to reduce cost on food (Riggová, 2012).

Motivating factor which has recently gained importance are the health benefits of vegetarianism (Hartinger, 2007). The health benefits and risks of vegetarianism are discussed in more detail below.

Vegetarianism and human health

The most commonly used definition of health can be found in World Health Organization documents. It is a state of bio-psycho-social well-being that has a subjective and objective component (WHO, 2017).

Objective advantages of vegetarianism include the normal values of a number of many parameters, which are among the features of the state of health. Sometimes they are even better than those in conventional food groups. Subjectively the vegetarians also evaluate their

status much more positively-, typically describe less digestive difficulties, lower body weight, more energy and vitality (Hartinger, 2007; Risi & Zürrer, 2007).

The risk assessment should take into account not only the content of a certain factor in food (determined on the basis of laboratory analyses), but also its bio availability (the relationship between intake and absorption) for the organism (Risi & Zürrer, 2007).

Vegetarians are particularly vulnerable to the following nutrient deficiencies:

- *Proteins and amino acids*. There is usually no reason to worry about lacto-ovo-vegetarian diet. Eggs and milk provide sufficient protein intake and contain all the essential amino acids in the right proportions so that they are optimally usable for the human body and are responsive to its physiological needs (Sharon, 2006). Higher risk exists with vegan diet because most plant proteins are incomplete. Therefore plant sources should be suitably combined which is not always easy (Kasper, 2015). Recent research has shown that it is not necessary to have all the essential amino acids present in one meal but to consume different sources of protein during the day (Kahleová et al., 2013).
- *Iron.* It plays an important role in the respiratory chain, in immune responses to oxygen transmission. The main source in the diet is red meat and inners. Although some plant sources contain high iron concentrations but low bioavailability (Kasper, 2015). Absorption of so-called heme iron from meat is about 15–30%, non-heme iron from plants only 2–10%. Vegetable sources contain only non-heme iron; in addition, its absorption can prevent other substances present, e.g. phytates, caffeine, tannins. On the other hand, vitamin C and organic acids, abundantly present in fruit, absorb iron. Moreover, after a longer vegetarian diet the organism adapts the metabolism of iron so as to increase its absorption and minimize losses (Kahleová et al., 2013).
- *Vitamin B_{12}*. This component of the vitamin B complex is almost absent in the vegetable diet, with the exception of yeast, seaweed and fermented soy products. Lacto-ovo-vegetarians usually do not suffer by the shortage – eggs and dairy products (especially sours) contain it in sufficient quantity. There is an increased risk of deficiency in vegans, with the gradual development of anemia and nervous disorders, yet these problems occur exceptionally. Possible explanation is the absorption of vitamin B_{12} from the intestine, where it is produced by bacteria (Kasper, 2015). The daily recommended doses of vitamin B_{12} are very low, when we totally eliminate foods containing vitamin B, the body's depletion is exhausted in about 2 to 4 years (Bukovský, 1992). Yet it is advisable for strict vegans to consume foods fortified with vitamin B_{12} or to use them as a dietary supplement (Kahleová et al., 2013). For consumers of a large number of leafy vegetables, folic acid can mask the manifestations of vitamin B_{12} deficiency, threatening irreversible damage to the nervous system (Sharon, 2006). An early solution by substitution modifies the condition without consequences (Kasper, 2015).
- *Vitamin D and calcium.* Vitamin D in the body is responsible for proper absorption and calcium function. It is commonly formed in the skin from cholesterol by the UV component of the sun's radiation. From food sources it is poorly digestible, no significant differences in the intake of vegetarians and non-vegetarians have been observed. In case of an acute deficiency, supplementation is recommended. Calcium is a mineral substance that forms an essential part of the skeleton and teeth, participates in the mechanism of muscle contraction, cardiac action, nerve signal transduction, blood clotting, etc. (Kasper, 2015). His income from lacto-vegetarians is comparable to non-vegetarians, but vegans are more vulnerable. Consumption of enriched foods is recommended. Calcium is abundantly represented in poppy, sesame, cabbage and broccoli (Kahleová et al., 2013).

- *Zinc.* It is used as a significant trace element, for example in glands, growth and development of tissues, in healing processes. Its major sources are food of animal origin, mainly meat. In sources of plant origin it is also included, but with a much worse bioavailability (similar to iron), it is necessary to ensure its adequate supply. Appropriate sources are for example pumpkin seeds (Kasper, 2015).
- *Iodine*. It is essential for thyroid function and metabolism to work properly, most of the population obtains it from iodized table salt. Vegetarians who add more seaweed to their diet have iodine feed even above average. Iodine deficiency may occur in vegetarians or vegans who consume a large amount of naturally occurring nutrients such as soybeans and cruciferous vegetables (Kahleová et al., 2013).
- *Omega-3 fatty acids*. They are used as part of the body's management and immune system. Their best source is fish meat, but current studies show that it has accumulated a number of toxic substances and the benefit of its consumption is therefore unambiguous (Kahleová et al., 2013). In milk and eggs, long-chain omega-3 unsaturated long chain fatty acids (EPA and DHA) are only to a small extent, lacto-guttaires are consuming insufficient amounts. In plant sources, EPA and DHA are virtually absent. A new option is to provide oils made from DHA-rich microscopic algae that significantly increase the concentration of DHA and EPA in the blood (Kasper, 2015).

Vegetarian diet altogether with a healthy lifestyle (on which vegetarians usually place more emphasis than non-vegetarians) brings a number of health benefits (Kasper, 2015):

- *Longer life span.* According to Kahleová et al. (2013) Long-term consumption of vegetarian diets (17 years and over) reduces the risk of overall mortality and increases the expected life expectancy by 3.6 years. By combining a vegetarian diet with regular body movement, maintaining optimal body weight and non-smoking, the life expectancy can be extended by 10 years.
- Decrease in obesity, metabolic syndrome and related consequences. Overweight and obesity are currently the most serious health problems in the world (Klescht, 2008). Obesity is closely related to so-called metabolic syndrome which refers to a set of clinical manifestations and changes in laboratory tests (composition of the lipid spectrum, increase in blood glucose, insulin resistance). All of these symptoms progressively impair health, reduce quality of life and increase the risk of serious illnesses (cardiovascular and type 2 diabetes) and death from their consequences. Compared to non-vegetarians, vegetarians have a lower weight and waist circumference, a half risk of developing metabolic syndrome as a whole and its individual manifestations, a significantly lower risk of death from ischemic heart disease, even after weight loss and smoking, lower blood pressure and lower blood levels (Kahleová et al., 2013).

According to a number of authorities (the American Dietetic Association, the Canadian Dietetic Association and the WHO) appropriately prepared vegetarian meals can be considered healthy, contain sufficient amount of all needed nutrients and are beneficial in the treatment and prevention of certain diseases. There is a hot debate about the suitability of vegetarian meals for individuals at all times of their lives. Studies show that a properly designed lacto-vegetarian diet can meet the body's requirements even during pregnancy, lactation, childhood and sports, but it does not seem to be a strict vegan diet. Care must always be taken to adhere to the principles of proper eating and to take into account possible risks of vegetarianism. It should never be a mere exclusion of meat from the diet (Kahleová et al., 2013). It is essential to supply the body with nutrition in the true sense, not just food (Risi & Zürrer, 2007).

1 Objectives

The main objective of the survey was to identify the opinions/attitudes of secondary school students on vegetarians and to vegetarianism. The partial objective of the research was to analyze data obtained and to compare it to similar studies.

2 Methods

The method used to obtain data was the quantitative type of research, specifically the questionnaire survey, which represents written questions for obtaining information from primary sources and is considered to be effective for the survey on opinions and attitudes of respondents (Průcha, 1995).

The attitude can be defined as "an evaluation made by an individual towards the outside world, to other entities and to himself or herself. It includes the availability to behave or respond in a relatively stable manner" (Mareš, Průcha, & Walterová, 2013, p. 171). Attitudes are an important part of our social perception. It is a relatively stable personality structure that greatly affects our acting and behavior. Practically we can have attitude towards – to specific persons, subjects, situations, and ideological things (Škobrtal, 2012; Wood, 2008). Attitudes are not innate, but they are formed during life on the basis of conscious and unconscious motives. We adopt most of our attitudes during socialization with the others; other attitudes are formed based upon gained information or personal experience (Škobrtal, 2012).

The used questionnaire was translated (Vařachová, 2018) from the American original called *Attitudes Toward Vegetarians Scale* (ATVS), which was created by the team of these authors – Chin, Fisak, and Sims (2002). This is a questionnaire combined with a scale, which is a type of questionnaire that is popular in the foreign surveys and commonly used. In such a questionnaire items are not usually formulated as questions, but as certain statements with which the respondent expresses his/her approval or disagreement, or shows his/her position on the rating scale (Průcha, 1995). The questionnaire was fully anonymous, respondents only filled out general identification data, such as gender, age, and type of school they attend. The core of the form used 33 items – statements on vegetarians where the respondents expressed their opinion using a four-step scale with these answers: "I completely/fully disagree, I somewhat disagree, I somewhat agree and I completely/fully agree."

The questionnaires were used upon a previous agreement with the management of the 4 monitored schools and upon an agreement with the authorized teacher. Each school received 90 pieces of questionnaires (360 pieces in total) and manual how to work with the questionnaires. Teachers distributed the questionnaires to the students to fill them in and then collected them. We received 311 completed forms (i.e. 86.4% of total number of distributed) back (Vařachová, 2018).

Data from the survey were processed using the statistical program Epi Info 6.02 En. The students' answers were evaluated in the whole set, then by gender, age and type of school. The chi-square test and its modification according to Yates and Mantel-Haenszel were used to analyze differences among groups (Dean et al., 1994). Two levels of significance were considered: 5% and 1% and better. For simplifying the evaluation the responses were grouped only into two groups for YES (including "I completely agree" and "I somewhat agree") and NO (including "I completely disagree" and "I somewhat disagree"). The individual items of the questionnaire were divided into 3 groups according to ethical questions (where items 3, 20, 22 and 26 are included), health issues (items 6–8 and 33) and social questions (with the remaining items, i.e. No. 1–2, 4–5, 9–19, 21, 23–25, 27–32).

Three working hypotheses have been identified. In general, the hypothesis is defined as a scientific assumption that expresses the relationship between two variables, at the same time defining a more specific direction of research. It arises either on the basis of the theoretical knowledge about the given phenomenon or on the basis of the practical experience of the researcher (Gavora, 2000).

Working hypotheses:

- H_1: Girls will be more tolerant to vegetarians than boys in social issues.
- H_2: Girls will be less skeptical about the vegetarian than the boys.
- H_3: Older students will have in ethical questions on vegetarianism more positive attitude than the junior students.

The survey respondents were students from 4 secondary schools in the town of Kyjov (district Hodonín in the Czech Republic) – Klvaňa Grammar School, Secondary Nursing and Social School, Secondary Vocational Automobile School and Secondary Vocational School Havlíčkova. It was a deliberate choice, the aim of which was to get answers from students from different schools, different subjects of study and composition and characteristics of students.

Klvaňa Grammar School (KGS) is a state-owned school offering either four-year or eight-year studies. The graduates are highly successful at passing the entrance examinations at various universities. Secondary Nursing and Social School (SNSS) provides four-year study comprising of Medical Lyceum, Health Assistant and Social Care. Secondary Vocational Automobile School (SVAS) is a state secondary school offering four year courses – Means of Transport and Autotronic. Secondary Vocational School Havlíčkova (HA) offers a three-year study in various fields – engineering, electrical engineering, construction, gastronomy and nursing services. Part of this school portfolio is also a four-year course finished with the State Leaving Exam either as a Mechanic, Plumber, Electrical Engineer and 2 year studies of Business Administration (Catalog schools, 2017).

Of total of 311 respondents, 169 were boys (54.3%) and 142 girls (45.7%). By age distribution of these 311 students 148 were under 18 years (47.6%) and 163 were eighteen and older (52.4%). By various schools there were 79 students from Klvaňa Grammar School, 76 from Secondary Nursing and Social School, 81 from Secondary Vocational Automobile School and 75 students from Vocational School Havlíčkova.

3 Results

Legend:

- KGS: Klvaňa Grammar School;
- SNSS: Secondary Nursing and Social School;
- SVAS: Secondary Vocational Automobile School;
- HA: Secondary Vocational School Havlíčkova.

Item 1: Vegetarians talk too much about their beliefs and eating habits

Most of the students do not have very clear opinion on this comment, 44% of boys agreed to this comment, almost the same percentage of girls mostly disagreed. There was no significant difference in the age group and their beliefs. When comparing types of schools, the Grammar

School students and Nursing School somewhat agreed, while Vocational schools students expressed complete agreement (16–17%).

Item 2: Vegetarians should not try to hide their eating habits

The students from different types of school generally believe that vegetarians should not somehow hide their eating habits, fully agreed 35% of the respondents. 15% fully disagreed.

Item 3: Vegetarians are indifferent to animal rights

Table 1

Evaluation of Responses to Item 3 – Total students, breakdown of responses by gender, age and types of schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	40.2%	29.6%	52.8%	42.6%	38.0%
Somewhat disagree	33.8%	37.3%	29.6%	28.4%	38.7%
Somewhat agree	16.7%	21.3%	11.3%	18.2%	15.3%
Completely agree	9.3%	11.8%	6.3%	10.8%	8.0%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	50.6%	48.7%	27.2%	34.7%	
Somewhat disagree	45.6%	22.4%	34.6%	32.0%	
Somewhat agree	3.8%	17.1%	29.6%	16.0%	
Completely agree	0.0%	11.8%	8.6%	17.3%	

Table 1 show that most students (74%) disagree that vegetarians are indifferent to animal rights. In general and also across the different categories they chose the options for responses “I completely disagree” and “I somewhat disagree”. More than half of the girls even expressed a complete disagreement, while only one third of the boys chose this variant.

Item 4: The eating habits of vegetarians are detrimental to the country's tradition

Table 2

Evaluation of responses to item No. 4 – Total students, further breakdown of responses by gender, age and types of schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	33.0%	21.9%	46.5%	37.8%	28.8%
Somewhat disagree	38.6%	40.2%	36.6%	36.5%	40.5%
Somewhat agree	13.8%	18.3%	8.5%	12.8%	14.7%
Completely agree	14.5%	19.5%	8.5%	12.8%	16.0%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	41.8%	48.7%	23.5%	18.7%	
Somewhat disagree	36.7%	31.6%	37.0%	49.3%	
Somewhat agree	11.4%	11.8%	18.5%	13.3%	
Completely agree	10.1%	7.9%	21.0%	18.7%	

The majority of students disagreed that *the eating habits of vegetarians are detrimental to the country's traditions* more than 70% expressed complete disagreement (Table 2). By gender the girls showed more (46%) disapproval than boys 22%. Completely agreed – situation was the opposite (20% of boys and 8% of girls). There was also a slight difference in age-based opinions, younger students responded to this item "completely disagreed" in 38%, the older students in 29%. The students of the grammar school and the nursing school disagreed with the opinion, and on the other hand the vocational school students agreed more. A significant difference is shown between the Nursing school and Secondary Vocational School Havlíčkova.

Item 5: Individuals who do not eat meat are weaker individuals than meat eaters

Table 3

Evaluation of Responses to Item 5 – Total students, responses by gender, age and different schools.

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	33.8%	21.9%	47.9%	33.8%	33.7%
Somewhat disagree	27.3%	26.0%	28.9%	27.0%	27.6%
Somewhat agree	20.3%	23.7%	16.2%	16.9%	23.3%
Completely agree	18.6%	28.4%	7.0%	22.3%	15.3%
Answer	KGS (n =79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	49.4%	46.1%	22.2%	17.3%	
Somewhat disagree	25.3%	28.9%	30.9%	24.0%	
Somewhat agree	11.4%	19.7%	22.2%	28.0%	
Completely agree	13.9%	5.3%	24.7%	30.7%	

Table 3 shows there is not a straightforward opinion on question whether vegetarians are weak. One third of students completely disagree with this statement. A significant difference is clear between the boy s and girls' views – 48% of the girls completely disagreed and only 7% completely agreed, the boys were more balanced in two polarized opinions – about 22% completely disagreed and more than 28% completely agreed. The age of respondents does not play a significant role. When classifying responses according to different schools, it shows that grammar school and nursing school students mostly do not agree and only few have opposite opinion. The students from both vocational schools agreed and disagreed approximately the same.

Item 6: It is possible to eat a balanced diet without meat

Table 4

Evaluation of Responses to Item No. 6 – Total students, Distribution of Responses by Gender, Age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	21.5%	30.2%	11.3%	21.6%	21.5%
Somewhat disagree	27.0%	26.6%	27.5%	28.4%	25.8%
Somewhat agree	35.4%	30.8%	40.8%	33.8%	36.8%
Completely agree	16.1%	12.4%	20.4%	16.2%	16.0%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	19.0%	14.5%	28.4%	24.0%	
Somewhat disagree	16.5%	32.9%	29.6%	29.3%	
Somewhat agree	39.2%	40.8%	28.4%	33.3%	
Completely agree	25.3%	11.8%	13.6%	13.3%	

As we can see it from Table 4 – whether it is possible to eat a balanced diet without meat, the distribution of positive and negative responses was almost fifty-fifty. However, the responses of boys and girls differed significantly. One third of the boys and one tenth of girls expressed complete disagreement. Differentiation of responses by age was not reflected in this item. When comparing the answers from different schools, the grammar school students responded with complete agreement or somewhat agreement. The views of the students of the Nursing school were similar; their responses differed significantly in the choice of the possibility of a complete disagreement, compared to the grammar school student. 13% of both vocational school students believe that it is possible to eat a balanced vegetarian diet without meat.

Item 7: Vegetarians are too concerned to worry about their weight gain

Table 5

Evaluation of Responses to Item No. 7 – Total students, Distribution of Responses by Gender, Age and Individual Schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	24.1%	14.8%	35.2%	23.0%	25.2%
Somewhat disagree	46.3%	44.4%	48.6%	50.0%	42.9%
Somewhat agree	16.7%	23.1%	9.2%	14.2%	19.0%
Completely agree	12.9%	17.8%	7.0%	12.8%	12.9%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	31.6%	32.9%	22.2%	9.3%	
Somewhat disagree	50.6%	46.1%	46.9%	41.3%	
Somewhat agree	10.1%	10.5%	19.8%	26.7%	
Completely agree	7.6%	10.5%	11.1%	22.7%	

Table 5 shows that almost half of the interviewed students express “somewhat disagree” opinion with the statement. However, by comparing gender-based responses, boys more often opted for a complete agreement and somewhat agreement than girls. Responses distributed by age did not differ significantly. The situation was similar in the replies of the students from different schools, except for the vocational Havlíčkova school (9% of students completely disagreed, 23% completely agreed).

Item 8: Vegetarians are mentally ill

Table 6

Evaluation of Responses to Item No. 8 – Total students, Distribution of Responses by Gender, Age and different Schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	43.4%	30.8%	58.5%	41.2%	45.4%
Somewhat disagree	26.0%	23.1%	29.6%	24.3%	27.6%
Somewhat agree	13.8%	19.5%	7.0%	14.9%	12.9%
Completely agree	16.7%	26.6%	4.9%	19.6%	14.1%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	58.2%	61.8%	27.2%	26.7%	
Somewhat disagree	22.8%	32.9%	25.9%	22.7%	
Somewhat agree	10.1%	3.9%	19.8%	21.3%	
Completely agree	8.9%	1.3%	27.2%	29.3%	

As shown in Table 6, more than 43% of the respondents completely disagree with the statement, a third somewhat or completely agrees. A significant difference was observed in boys "and girls" views – 58% of girls, but only 31% of boys completely disagreed, 27% of boys and only 5% of girls completely agreed. Responses sorted by age categories did not show any significant differences. There was a complete disagreement expressed by the grammar school and the nursing school students, a quarter of those students somewhat disagreed, the agreeing opinion was low. All vocational school students' responses were represented by similar percentages.

Item 9: Restaurants do not provide a sufficient selection of dishes to please everybody

About one-third of boys and girls voted for complete agreement, a third of complete disagreement, 24% of boys, and 13% of girls voted for a complete disagreement. In the age categories the respondents' answers did not differ significantly. According to different schools the difference was mainly in the opinions of grammar school students, where more than half of them somehow agreed, only one tenth completely disagreed.

Item 10: In some cases people have no choice but to become a vegetarian

Most respondents disagreed with this statement, 42% of students completely agreed and 35% somewhat disagreed. Only 8% of respondents completely agreed. Percentage frequency of responses was very similar across all categories.

Item 11: One of the best things for me would be not to eat meat or meat products anymore

The majority of students (86%) disagreed with the statement. When comparing gender-based opinions, 73% of boys and 56% of girls completely disagreed, only 6% of boys and girls completely agreed. The age did not have any significant impact on the responses, nor did the comparison of the answers of students in different schools.

Item 12: It is wrong to tease someone because he or she is a vegetarian

Table 7

Evaluation of Responses to Item 12 – Total students, Responses by Gender, Age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	10.6%	13.6%	7.0%	12.2%	9.2%
Somewhat disagree	14.8%	21.3%	7.0%	16.9%	12.9%
Somewhat agree	20.3%	26.0%	13.4%	20.9%	19.6%
Completely agree	54.3%	39.1%	72.5%	50.0%	58.3%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	3.8%	10.5%	17.3%	10.7%	
Somewhat disagree	11.4%	9.2%	14.8%	24.0%	
Somewhat agree	12.7%	11.8%	30.9%	25.3%	
Completely agree	72.2%	68.4%	37.0%	40.0%	

Table 7 clearly shows that 54% of the respondents fully agree with the statement that it is not nice to tease vegetarians because of their lifestyle. However, there is difference in responses

by gender. 72% girls completely agree, somewhat agree 13%, and completely or somewhat 7%, while 39% boys fully agree and 26% somewhat agree, somewhat disagree 21% and completely disagree 14%. Significant differences in age-matched responses were not recorded. Grammar school and nursing school students share a consensual agreeable view, at the vocational schools too, but to a lesser extent.

Item 13: Rejecting meat consumption is only a transition period in somebody's life

Table 8

Evaluation of responses to Item No. 13 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	21.2%	21.9%	20.4%	22.3%	20.2%
Somewhat disagree	45.7%	40.8%	51.4%	52.0%	39.9%
Somewhat agree	27.7%	29.6%	25.4%	20.3%	34.4%
Completely agree	5.5%	7.7%	2.8%	5.4%	5.5%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	12.7%	25.0%	27.2%	20.0%	
Somewhat disagree	51.9%	48.7%	45.7%	36.0%	
Somewhat agree	31.6%	22.4%	21.0%	36.0%	
Completely agree	3.8%	3.9%	6.2%	8.0%	

Almost 46% of students mostly somewhat disagree with Item 13 on the transition period when an individual refuses to eat meat, 20–25% represents complete or somewhat disagreement and it varied in most categories (Table 8). Only 8% of boys and 3% of girls completely agreed. The responses of both age categories did not differ significantly. In the case of different schools the responses of the grammar school and the Havlíčkova school were the most different, where the grammar school students more strongly disagreed.

Item 14: There are good reasons why not to eat meat

Table 9

Evaluation of Responses to Item No. 14 – Total students, Responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	31.5%	45.0%	15.5%	34.5%	28.8%
Somewhat disagree	25.4%	20.7%	31.0%	25.7%	25.2%
Somewhat agree	29.3%	24.9%	34.5%	27.7%	30.7%
Completely agree	13.8%	9.5%	19.0%	12.2%	15.3%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	16.5%	18.4%	51.9%	38.7%	
Somewhat disagree	20.3%	42.1%	13.6%	26.7%	
Somewhat agree	41.8%	25.0%	21.0%	29.3%	
Completely agree	21.5%	14.5%	13.6%	5.3%	

The data in Table 9 indicate inconsistency of opinion on this statement. Significant differences were observed in gender-responsive responses, where a tenth of boys and a fifth of girls completely agreed, 45% of boys and only 16% of girls completely disagreed. Within various types of schools differences in responses were significant – for example Automotive school students completely disagreed in 52%, grammar school students in 16%, Havlíčkova school students completely agreed in 5%, grammar school students in 22%.

Item 15: Vegetarians are too idealistic

Table 10

Evaluation of responses to Item No. 15 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	11.9%	11.8%	12.0%	13.5%	10.4%
Somewhat disagree	39.9%	32.0%	49.3%	37.8%	41.7%
Somewhat agree	32.2%	35.5%	28.2%	32.4%	31.9%
Completely agree	16.1%	20.7%	10.6%	16.2%	16.0%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	5.1%	18.4%	12.3%	12.0%	
Somewhat disagree	46.8%	46.1%	37.0%	29.3%	
Somewhat agree	35.4%	25.0%	30.9%	37.3%	
Completely agree	12.7%	10.5%	19.8%	21.3%	

According to Table 10 regarding Item 15 most of the students chose the option of partial agreement or disagreement, a total of about 70%. Gender-based responses were mostly different to the possibility of somewhat disagreement, which was chosen by almost half of girls and a third of boys. The difference in answers sorted by age categories was not recorded. There is a big difference between the answers of the grammar school students 5% and nursing school students 18%. Both vocational school students had almost identical answers-mostly agree.

Item 16: I would approve if my children decided to be vegetarians

Table 11

Evaluation of Responses to Item No. 16 – Total students, Responses by Gender, Age and different Schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	28.0%	33.7%	21.1%	29.1%	27.0%
Somewhat disagree	29.6%	34.3%	23.9%	27.7%	31.3%
Somewhat agree	26.7%	17.2%	38.0%	25.7%	27.6%
Completely agree	15.8%	14.8%	16.9%	17.6%	14.1%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	17.7%	26.3%	39.5%	28.0%	
Somewhat disagree	21.5%	23.7%	30.9%	42.7%	
Somewhat agree	40.5%	36.8%	12.3%	17.3%	
Completely agree	20.3%	13.2%	17.3%	12.0%	

Table 11 shows that the question whether respondents would approve if their potential children decide to be vegetarians, all students chose almost the same 30% chance of full and somewhat disagreement and somewhat agreement. Complete agreement was selected only by 16%. When splitting gender responses, girls would more likely agree if their potential children become vegetarians, the boys' opinion is the opposite. There was no major difference in responses by age. In case of different schools, the grammar school and the nursing school students agreed with the statement and the vocational school students did not agree.

Item 17: Many vegetarians secretly long for meat

Table 12

Evaluation of Responses to Item No. 17 – Total students, responses by sex, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	17.0%	14.2%	20.4%	18.2%	16.0%
Somewhat disagree	41.5%	37.9%	45.8%	41.2%	41.7%
Somewhat agree	28.3%	29.0%	27.5%	28.4%	28.2%
Completely agree	13.2%	18.9%	6.3%	12.2%	14.1%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	20.3%	13.2%	16.0%	18.7%	
Somewhat disagree	50.6%	51.3%	27.2%	37.3%	
Somewhat agree	25.3%	28.9%	34.6%	24.0%	
Completely agree	3.8%	6.6%	22.2%	20.0%	

Table 12 clearly shows that more respondents disagree with this statement, which is also true for the classification of responses by gender and age. In the case of grammar school and nursing school students, disagreements prevail, while the vocational school students agree.

Item 18: It is acceptable for an individual to refuse meat served to him or her

Table 13

Evaluation of Responses to Item 18 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	11.6%	18.3%	3.5%	13.5%	9.8%
Somewhat disagree	22.2%	27.2%	16.2%	18.2%	25.8%
Somewhat agree	42.8%	39.1%	47.2%	41.9%	43.6%
Completely agree	23.5%	15.4%	33.1%	26.4%	20.9%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	5.1%	6.6%	18.5%	16.0%	
Somewhat disagree	16.5%	18.4%	28.4%	25.3%	
Somewhat agree	48.1%	40.8%	39.5%	42.7%	
Completely agree	30.4%	34.2%	13.6%	16.0%	

According to Table 13, item 18, students in the overwhelming majority agreed that it is acceptable to refuse the served meat. A similar trend was also observed in responses sorted by age. Within all schools most of the groups chose the option of somewhat agreement, more pronounced differences were seen in the form of a complete disagreement (around 6% for grammar school and nursing school students and over 16% for vocational school students), and complete agreement (over 30% of the secondary and nursing school students and about 15% for students from both vocational schools).

Item 19: Vegetarians respect the rights of others who decided to eat meat

Table 14

Evaluation of Responses to Item No. 19 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	13.2%	16.0%	9.9%	13.5%	12.9%
Somewhat disagree	27.0%	30.8%	22.5%	27.0%	27.0%
Somewhat agree	36.0%	32.0%	40.8%	36.5%	35.6%
Completely agree	23.8%	21.3%	26.8%	23.0%	24.5%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	8.9%	11.8%	16.0%	16.0%	
Somewhat disagree	19.0%	23.7%	29.6%	36.0%	
Somewhat agree	49.4%	34.2%	30.9%	29.3%	
Completely agree	22.8%	30.3%	23.5%	18.7%	

Table 14 shows that the overwhelming majority of respondents strongly or unequivocally agree with the statement that vegetarians respect the right of people who eat conventionally, 13% of the respondents do not agree at all. Boys are more opposed than girls (approximately 14% difference). There were no differences among respondents sorted by age group. When comparing different types of schools, the grammar school students strongly agree, the vocational students more disagreed.

Item 20: Vegetarians believe that vegetarianism is the only moral way of consuming food

In this statement somewhat agreement and somewhat disagreement was represented almost equally (32% and 34%), which was true for complete agreement and complete disagreement. A similar trend was also observed in the classification of responses by gender and by age category. The answers of the students of different schools differed, mainly grammar school students somehow disagreed in 48% and completely disagreed in 10%, unlike automotive school students in 30% predominantly disagreed and 26% of respondents completely disagreed.

Item 21: Vegetarians use their eating habits to draw attention

Table 15

Evaluation of Responses to Item No. 21 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	27.7%	20.7%	35.9%	28.4%	27.0%
Somewhat disagree	39.2%	33.7%	45.8%	41.2%	37.4%
Somewhat agree	18.3%	22.5%	13.4%	14.9%	21.5%
Completely agree	14.8%	23.1%	4.9%	15.5%	14.1%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	34.2%	36.8%	21.0%	18.7%	
Somewhat disagree	40.5%	43.4%	40.7%	32.0%	
Somewhat agree	13.9%	14.5%	17.3%	28.0%	
Completely agree	11.4%	5.3%	21.0%	21.3%	

The majority of students (almost 70%) with the statement did not agree, especially the girls. Differences in age group responses were irrelevant. The answers were very different at different schools of complete disagreement (37% of the nursing school, 19% Havlíčkova school) and complete agreement (about 5% at the nursing school, 21% at the vocational schools).

Item 22: Vegetarians would refuse to eat meat, even if it was a matter of life and death

The majority of respondents disagreed with this statement. The majority of students 43% somehow disagreed. Significant difference in dissatisfaction was evident in responding by gender – 31% of boys clearly did not agree unlike only 12% of girls, 36% of boys and over 50% of girls somewhat disagree. When splitting by age group, one third of students under 18 years and half of students over 18 years somewhat disagree. Within different types of schools the respondents (with the exception of Havlíčkova school) opted for a major disagreement.

Item 23: Being a vegetarian is only possible for people living in modern society

The most common answer was major disagreement. Significant differences were not observed in the classification of responses by gender, age and different schools.

Item 24: People who order vegetarian food often want to save money

Table 16 shows a majority disagreement with this statement (39% complete disagreement, 42% major disapproval). When classifying the responses by gender almost one-third of the boys and almost half of the girls completely disagreed, one-tenth of boys completely agreed and only 3.5% of the girls. Within the age group the responses did not differ significantly. For different schools the percentage of respondents was relatively different: more than half of the grammar school students completely disagreed, and only one third of the vocational school students, the majority of students from all schools mostly agree, nursing school students clearly agreed in 1% and 16% of the students from Havlíčkova school.

Table 16

Evaluation of Responses to Item No. 24 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	38.9%	30.8%	48.6%	36.5%	41.1%
Somewhat disagree	42.1%	44.4%	39.4%	41.9%	42.3%
Somewhat agree	12.2%	15.4%	8.5%	13.5%	11.0%
Completely agree	6.8%	9.5%	3.5%	8.1%	5.5%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	54.4%	44.7%	24.7%	32.0%	
Somewhat disagree	31.6%	43.4%	42.0%	52.0%	
Somewhat agree	8.9%	10.5%	17.3%	12.0%	
Completely agree	5.1%	1.3%	16.0%	4.0%	

Item 25: Many vegetarians privately secretly eat meat

Table 17

Evaluation of Responses to Item No. 25 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	32.5%	20.7%	46.5%	34.5%	30.7%
Somewhat disagree	37.9%	39.1%	36.6%	33.1%	42.3%
Somewhat agree	19.9%	24.9%	14.1%	20.3%	19.6%
Completely agree	9.6%	15.4%	2.8%	12.2%	7.4%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	43.0%	43.4%	25.9%	17.3%	
Somewhat disagree	40.5%	32.9%	35.8%	42.7%	
Somewhat agree	11.4%	18.4%	27.2%	22.7%	
Completely agree	5.1%	5.3%	11.1%	17.3%	

Most respondents disagreed with this statement. A big difference was evident in gender-based responses, where girls opposed much (in 83%), and only 17% girls agreed, while boys disagreed in about 60% and agreed in 40%. There were no significant differences in the distribution of responses by age. When comparing different schools, opinions differentiated into two groups – grammar school and nursing school students more disagreed than vocational school students.

Item 26: People are not superior to all other creatures

Respondents' opinion on this statement was relatively unquantifiable, responses represented by relative frequencies range from 20% to 30%. There were no major differences in responses by gender, age or type of school. The humanitarian schools students showed somewhat less opposition to this disagreement than the vocational school students.

Item 27: I avoid contact with vegetarians whenever possible

Table 18

Evaluation of Responses to Item No. 27 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	57.6%	43.2%	74.6%	53.4%	61.3%
Somewhat disagree	27.0%	34.9%	17.6%	27.0%	27.0%
Somewhat agree	6.8%	8.9%	4.2%	6.8%	6.7%
Completely agree	8.7%	13.0%	3.5%	12.8%	4.9%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	73.4%	65.8%	38.3%	53.3%	
Somewhat disagree	21.5%	22.4%	40.7%	22.7%	
Somewhat agree	2.5%	6.6%	7.4%	10.7%	
Completely agree	2.5%	5.3%	13.6%	13.3%	

Table 18 shows that only 15% of the students agree with the statement, almost 60% respond with complete disagreement. The girls opted for disagreement in 75%, the agreement was only about 7%, the boys agreed more than the girls. In age – specific responses there full agreement – the younger group was elected in 13%, older only in 5%. Within different types of schools the grammar school students' answers were different, where only 5% agreed and three quarters of the students from other schools opted for a complete disagreement.

Item 28: If vegetarians win in their opinions, companies selling animal products would declare bankruptcy

Table 19

Evaluation of Responses to Item 28 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	15.8%	18.3%	12.7%	19.6%	12.3%
Somewhat disagree	30.9%	26.0%	36.6%	34.5%	27.6%
Somewhat agree	28.9%	29.6%	28.2%	24.3%	33.1%
Completely agree	24.4%	26.0%	22.5%	21.6%	27.0%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	7.6%	18.4%	16.0%	21.3%	
Somewhat disagree	34.2%	32.9%	30.9%	25.3%	
Somewhat agree	44.3%	19.7%	25.9%	25.3%	
Completely agree	13.9%	28.9%	27.2%	28.0%	

This item shows the indecision of the respondents. There was similar number of agreeable and disagreeable answers with almost identical frequency, the possibilities of somewhat agreement and disagreement were represented by about 30%. Gender-based responses varied only with the option of somewhat disagreement (girls chose it in 37%, boys in 26%). Younger students were more opposed to the elders. The opinions of the respondents of different schools differed mainly in grammar schools students (40% disagreed), while students from other schools (approximately half of students) did not agree.

Item 29: Vegetarians believe they are better than other people

Table 20

Evaluation of the answers to item 29 – Total students, responses by gender, age and different school schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	21.9%	16.0%	28.9%	20.3%	23.3%
Somewhat disagree	36.3%	32.0%	41.5%	41.9%	31.3%
Somewhat agree	29.6%	34.9%	23.2%	25.7%	33.1%
Completely agree	12.2%	17.2%	6.3%	12.2%	12.3%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	22.8%	27.6%	27.2%	9.3%	
Somewhat disagree	41.8%	44.7%	24.7%	34.7%	
Somewhat agree	30.4%	21.1%	37.0%	29.3%	
Completely agree	5.1%	6.6%	11.1%	26.7%	

Table 20 shows that the majority of the students does not agree with the statement. Three-quarters of girls disagree it is only half of the boys who disagrees. When classifying responses by age there was no significant difference in opinion. When comparing different schools the grammar school and nursing school students (more than 60% disagreed) unlike vocational school students (approximately half of them did not agree, only about 40% at the Havlíčkova school).

Item 30: Vegetarians are specially nice and gentle

Almost 40% of the respondents opted for a disagreeable answer, less than 5% with the statement completely agreed. The responses corresponding to the overall trend were the same in both genders. In the age group the answers were almost the same, with the older respondents predominantly disagreeing. The answers from various schools were more or less the same, following the general trend. Grammar school students were an extreme-none of them opted for complete agreement and more than a tenth of the nursing school students completely agreed.

Item 31: I would feel guilty if I ate meat in front of a vegetarian

In the whole group 85% of the respondents would not feel guilty about eating meat in front of a vegetarian, only 5% would have the opposite feeling. Opinions did not differ significantly in gender responses and by age. In the case of different schools, about 90% would agree with the opinion about a tenth of grammar school students and Havlíčkova school students agree. More than three-quarters of nursing school and automotive school students would not agree.

Item 32: People who refuse to eat meat are childish and juvenile

Table 21

Evaluation of Responses to Item 32 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	31.2%	18.9%	45.8%	26.4%	35.6%
Somewhat disagree	39.2%	38.5%	40.1%	40.5%	38.0%
Somewhat agree	15.4%	18.3%	12.0%	16.9%	14.1%
Completely agree	14.1%	24.3%	2.1%	16.2%	12.3%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	44.3%	42.1%	19.8%	18.7%	
Somewhat disagree	35.4%	43.4%	39.5%	38.7%	
Somewhat agree	7.6%	13.2%	19.8%	21.3%	
Completely agree	12.7%	1.3%	21.0%	21.3%	

According to Table 21 most of the students does not agree with the statement. The views of boys and girls differ considerably: 19% of boys and almost 46% of girls completely disagreed, 24% of boys and 2% of girls completely agreed. Similar opinions were seen in the classification of responses by age category. When classifying according to different schools, it was mainly the nursing school students who completely disagreed like the grammar school students, and only slightly differentiated from the vocational school students, however, only 1% of students completely agreed.

Item 33: Vegetarians often look sick and unhealthy

Table 22

Evaluation of the answers to item 33 – Total students, responses by gender, age and different schools

Answer	Everybody (n = 311)	Boys (n = 169)	Girls (n = 142)	Age < 18 years (n = 148)	Age ≥ 18 years (n = 163)
Completely disagree	29.6%	20.7%	40.1%	34.5%	25.2%
Somewhat disagree	35.7%	37.9%	33.1%	29.7%	41.1%
Somewhat agree	19.9%	21.9%	17.6%	19.6%	20.2%
Completely agree	14.8%	19.5%	9.2%	16.2%	13.5%
Answer	KGS (n = 79)	SNSS (n = 76)	SVAS (n = 81)	HA (n = 75)	
Completely disagree	31.6%	43.4%	27.2%	16.0%	
Somewhat disagree	39.2%	27.6%	28.4%	48.0%	
Somewhat agree	17.7%	17.1%	29.6%	14.7%	
Completely agree	11.4%	11.8%	14.8%	21.3%	

It is clear from Table 22 that two-thirds of the respondents disagree with the statement. There is a clear difference between the responses of boys and girls, with almost three-quarters of girls disagreeing against two-thirds of the boys, and almost twice as often opted for a complete disagreement. Younger students more opted for complete disagreement and complete agreement over partial opinions. Within different types of schools, nursing school students and grammar school students completely disagreed. The greatest indecision was among the automotive school students, where almost a third somewhat agreed and disagreed. At Vocational School Havlíčkova almost half of the respondents chose the possibility of somewhat disagreement.

The results of gender and age classification for all 33 questionnaires were summarized in Table 23 expressing the percentage of complete and somewhat agreement (YES) and complete and somewhat disagreement (NOT). The groups of questions are distinguished as follows: ethical issues (E), social issues (S) and health issues (H). The values p were divided into two categories according to significance levels – 5% significance, represented in the table by the * symbol, and 1% and better significance symbolized by **. Differences statistically insignificant are referred to as SI.

Table 23

Percentage representation of YES / NO responses by gender and age classification

Item	Answer	Classification by gender				By age			
		Boys (%)	Girls	X^2	P	Age < 18 Years (%)	Age ≥ 18 Years (%)	X^2	P
1 S	NOT	39.1	47.2	2.08	SI	45.3	40.5	0.72	SI
	YES	61.0	52.8			54.7	59.5		
2 S	NOT	38.4	31.7	1.55	SI	34.4	36.2	0.10	SI
	YES	61.6	68.3			65.6	63.8		
3 E	NOT	66.9	82.4	9.66	**	71.0	76.7	1.33	SI
	YES	33.1	17.6			29.0	23.3		
4 S	NOT	62.1	83.1	16.72	**	74.3	69.3	0.96	SI
	YES	37.8	17.0			25.6	30.7		
5 S	NOT	47.9	76.8	18.74	**	60.8	61.3	0.01	SI
	YES	52.1	23.2			39.2	38.6		
6 H	NOT	56.8	38.8	10.09	**	50.0	47.3	0.24	SI
	YES	43.2	61.2			50.0	52.8		
7 H	NOT	59.2	83.8	22.47	**	73.0	68.1	0.88	SI
	YES	40.9	16.2			27.0	31.9		
8 H	NOT	53.9	88.1	42.50	**	65.5	73.0	2.04	SI
	YES	46.1	11.9			34.5	27.0		
9 S	NOT	54.5	45.1	2.71	SI	52.1	48.4	0.39	SI
	YES	45.5	54.9			48.0	51.5		
10 S	NOT	78.2	76.0	0.18	SI	77.0	77.3	0.00	SI
	YES	21.9	24.9			23.0	22.7		

Item	Answer	Classification by gender				By age			
		Boys (%)	Girls	X^2	P	Age < 18 Years (%)	Age ≥ 18 Years (%)	X^2	P
11 S	NOT	89.4	83.1	2.58	SI	87.8	85.3	0.44	SI
	YES	10.6	16.9			12.2	14.7		
12 S	NOT	34.9	14.0	17.66	**	29.1	22.1	1.99	SI
	YES	65.1	85.9			70.9	77.9		
13 S	NOT	62.7	71.8	2.89	SI	74.3	60.1	7.06	**
	YES	37.3	28.2			25.7	39.9		
14 S	NOT	65.7	46.5	11.60	**	60.2	54.0	1.20	SI
	YES	34.4	53.5			39.9	46.0		
15 S	NOT	43.8	61.3	9.44	**	51.3	52.1	0.02	SI
	YES	56.2	38.8			48.6	47.9		
16 S	NOT	68.0	45.0	16.68	**	56.8	58.3	0.07	SI
	YES	32.0	54.9			43.3	41.7		
17 S	NOT	52.1	66.2	6.34	*	59.4	57.7	0.10	SI
	YES	47.9	33.8			40.6	42.3		
18 S	NOT	45.5	19.7	23.05	**	31.7	35.6	0.51	SI
	YES	54.5	80.3			68.3	64.5		
19 S	NOT	46.8	32.4	6.61	*	40.5	39.9	0.01	SI
	YES	53.3	67.6			59.5	60.1		
20 E	NOT	48.0	35.8	0.14	SI	48.7	45.4	0.33	SI
	YES	52.0	54.2			51.4	54.6		
21 S	NOT	54.4	81.7	25.87	**	69.6	64.4	0.94	SI
	YES	45.6	18.3			30.4	35.6		

Item	Answer	Classification by gender				By age			
		Boys (%)	Girls	X^2	P	Age < 18 Years (%)	Age ≥ 18 Years (%)	X^2	P
22 E	NOT	66.9	52.7	0.59	SI	60.8	68.7	2.14	SI
	YES	33.1	37.3			39.2	31.3		
23 S	NOT	72.2	71.1	0.04	SI	73.0	70.6	0.22	SI
	YES	27.9	28.8			27.0	29.4		
24 S	NOT	75.2	88.0	8.33	**	78.4	83.4	1.29	SI
	YES	24.9	12.0			21.6	16.5		
25 S	NOT	59.8	83.1	20.17	**	67.6	73.0	1.10	SI
	YES	40.3	16.9			32.5	27.0		
26 E	NOT	58.0	57.0	0.03	SI	59.5	55.8	0.42	SI
	YES	42.1	42.9			40.6	44.2		
27 S	NOT	78.1	92.2	11.83	**	80.4	88.3	3.74	SI
	YES	21.9	7.7			19.6	11.6		
28 S	NOT	44.3	49.3	0.75	SI	54.1	39.9	6.26	*
	YES	55.6	50.7			45.9	60.1		
29 S	NOT	48.0	70.4	16.05	**	62.2	54.6	1.82	SI
	YES	52.1	29.5			37.9	45.4		
30 S	NOT	60.3	50.0	3.35	SI	50.7	60.1	2.80	SI
	YES	39.7	50.0			49.3	39.8		
31 S	NOT	84.6	85.2	0.02	SI	86.5	83.5	0.56	SI
	YES	15.3	14.8			13.5	16.5		
32 S	NOT	57.4	85.9	30.13	**	66.9	73.6	1.69	SI
	YES	42.6	14.1			33.1	26.4		

Item	Answer	Classification by gender				By age			
		Boys (%)	Girls	X^2	P	Age < 18 Years (%)	Age ≥ 18 Years (%)	X^2	P
33 H	NOT	58.6	73.2	7.32	**	64.2	66.3	0.15	SI
	YES	41.4	26.8			35.8	33.7		

Hypothesis 1: Girls will be more tolerant to vegetarians than the boys in social issues. As can be seen from Table 23, differences in gender-specific answers (17 and 19) were recorded for some of the societal questionnaire items. Statistically significant differences were observed for items 4–5, 12, 14–16, 18, 21, 24–25, 27, 29 and 32. There were no significant differences in the remaining items that relate to issues of a social nature. *The hypothesis was not confirmed*.

Hypothesis 2: Girls will be less skeptical about the vegetarians than the boys. Table 23 shows that in all tested items dealing with health issues (6–8 and 33), the level of significance of the differences of gender responses was 5%. *The hypothesis was fully confirmed*.

Hypothesis 3: Older students will have a more positive attitude towards vegetarians in ethical issues than younger students. According to the data in Table 23 there was no significant difference between the age-matched answers in one of the ethical questions tested (3, 20, 22 and 26). *The hypothesis was not confirmed*.

4 Summary of results and discussion

The results of the research should be treated with caution (due to the intentionality and non-representativeness of the selection) they may not be generally applied.

The study found that attitudes towards vegetarians are predominantly positive at similar 4 secondary school students. Most have tolerant opinions on vegetarian lifestyle and disagreed with any form of social discrimination against vegetarians. Students did not worry that vegetarian eating habits might be detrimental to the conditions in the Czech Republic, nor did they agreed that vegetarians should hide their eating habits. Regarding the vegetarian dishes in restaurants, the respondents did not have a united opinion. This can be caused by a vague view of the meatless dishes on the menu, as well as the belief that if they order and eat vegetarian dishes in a restaurant it is not necessarily more expensive compared to conventional meals.

Most students accept the fact that the vegetarian would refuse the served meat; they also do not find any guilt about non vegetarians eating meat in front of the vegetarians. The students believe that vegetarians are more likely to talk about their beliefs and eating habits, but they do not think it is a deliberate effort to draw attention to them. Most students agree with the statement that vegetarians respect the rights of meat eaters. Half of the students agree or disagree with the belief of vegetarians that their meals as the only moral way. Most students do not think that vegetarians are superior to the others or practice their lifestyle exclusively in modern society.

The majority of the respondents disagreed with the statement that the vegetarians were mentally ill, yet a third of the group agreed. The students did not completely agree if the vegetarians are nice and gentle, they somewhat disagreed. Similar situation has been observed if vegetarians are weaker persons and exaggerate idealism. Most respondents do not believe that people in some situations have no other choice but to become a vegetarian. Most respondents disagree with the question whether vegetarians are indifferent to animal rights. Respondents do not agree in moderate predominance with the statement that people are not superior to all other creatures. The results are not very unambiguous, which may also be due to the formulation of the statement.

Almost indecisively (with a slight predominance of agreeing respondents) was answered the question whether it is possible to eat a balanced diet without meat. The majority of respondents do not think that vegetarians look sick and unhealthy, and most of them do not agree that vegetarians worry about gaining weight. The majority of the group disagreed with the statement about the secret desire of vegetarians for meat; a significant majority did not think vegetarians even secretly eat meat in private. Approximately half of the respondents mostly disagree with the statement that rejecting meat consumption would only be a time in their life that sooner or later will end. Likewise, students have expressed themselves about refusing to eat meat if it was a matter of life and death. The overwhelming majority of the group did not agree with saying that one of the best things to do in life is to omit meat and meat products in the diet. Most of them would also not approve if their potential children decided to be vegetarian.

The group of 311 people was represented by 169 boys and 142 girls. Comparing their responses is clear, female girls are more tolerant and have a more positive and open approach to vegetarianism than boys. They significantly less perceive vegetarianism as weakness, excessive idealism, eccentricity or even mental illness. They disagree with discrimination; on the contrary, they agree that vegetarians do not hide their lifestyle. The girls can easily imagine themselves or their potential to become vegetarians. They think they can eat healthy and even without meat. They are also less prejudiced against the vegetarian character than boys.

Respondents were divided by age into a group of 148 students up to 18 years of age (in our case 15–17 years) and 163 students aged 18 and over (18–24 years). The results showed that minor differences in opinions were observed within the age groups; almost all items were very similar to the percentage of respondents' answers.

When analyzing the answers sorted by different schools, it is necessary to emphasize the fact that the girls and boys were not represented equally in individual groups. At Klvaňa Grammar School and Nursing Secondary School there were more girls (out of 79 students at grammar schools there were 58 girls and 21 boys, 72 girls at the nursing school and only 4 boys, 76 students in total). On the contrary there were more boys at the vocational schools (there were 74 boys and 7 girls out of the total 81 at the Secondary Vocational Technical School and the Secondary Automotive Vocational School, 70 of the 75 questioned students at the Havlíčkova Secondary Vocational School) and only 5 girls. The level of general education among the students, knowledge of the human body, health and nutrition might have played a certain role as well. The results of students' responses from different school responded to the views expressed by the predominant gender representation. At the grammar school and nursing school attitudes to most items were more positive, moderate and tolerant than at vocational schools.

Three working hypotheses were set for research purposes. The first hypothesis, "Girls will be more tolerant to the vegetarians in social aspects than boys", has not been confirmed as

a whole, but the high number of items with a statistically significant difference indicates that this tendency exists. The second hypothesis, "Girls will be less skeptical about the vegetarians than the boys", was confirmed. Both hypotheses show that girls have generally more tolerant and positive attitudes towards vegetarians than boys. The third hypothesis, "Older students will have a more positive attitude towards ethics for vegetarians than younger students" has not been tested during testing, no statistically significant difference in responses to items from a group of ethical questions has been observed when classifying by age of respondents.

According to Chin, Fisak and Sims (2002), there is a marked increase in vegetarianism, but there are only a few surveys to address the issue of the attitudes of the majority society to vegetarians. At the same time negative attitudes can have a strong influence on vegetarians in social life, and even social stigmatization results (vegetarianism is the reason why the individual is undesirable) or ostracize (vegetarianism can lead to the exclusion of an individual from the group where he or she belonged).

The aforementioned American survey of attitudes to vegetarians evaluated the answers of 226 respondents, including 181 women and 45 men. They were college students of psychological disciplines with an average age of 21.8 years (Chin, Fisak, & Sims, 2002). Our respondents were secondary school students from different types of schools (grammar schools, nursing school and two vocational schools). We have approached 311 respondents (142 girls and 169 boys) with an average age of 18 years. The results of the survey are very similar to the American study – attitudes towards vegetarians are generally positive among the population. This state was explained in the US by the predominance of women among respondents, their young age and the fact that they were university students in the metropolitan area. Our survey also showed differences in boys "and girls" views, positive attitudes prevailed among girls, while negative attitudes and prejudices were more prevalent among boys. The general attitude towards the vegetarians sounded positive even though the boys predominated in the research sample. The average age of the sample of Czech students was lower than that of American university students, but did not play a major role in the attitudes of respondents. A comparison of opinions with a significantly older population group can be considered as the subject of further analysis. The effect of a large university center on the predominance of positive attitudes towards vegetarians is not significant; secondary school students in our study came from a smaller place, yet the results were similar. Differences in responses between school students were found. In most cases there were similar and more positive opinions by grammar school and nursing school students, more negative of vocational school students.

The US survey also notes the fact that the ATVS questionnaire does not specify exactly what type of vegetarianism is being considered. It is likely that lacto-ovo-vegetarianism with the mere exclusion of meat is accepted better than strict veganism, excluding all animal products. Similarly, the general opinion could influence the knowledge of motivation for vegetarianism, more tolerance of society for health reasons than for moral reasons is assumed. Questions in the questionnaire were intentionally compiled to evaluate attitudes towards vegetarians as persons who are not familiar with the interviewees (Chin et al., 2002).

5 Conclusions

The research dealt with the attitudes to the vegetarians of the students of four selected secondary schools. It can be stated that positive attitudes prevailed. It turned out that girls have a more positive and conciliatory attitude towards vegetarians than boys. They are more tolerant of this lifestyle and less burdened by prejudices. Still, the views of the boys did not

have a strictly uncompromising character. Attitudes in the group of younger and older students did not differ significantly; the age factor of the respondents did not have any effect in this study. Comparing the attitudes of the students surveyed by different schools, however, showed significant differences. The most positive attitude and tolerant attitude were held by the grammar school students, then the nursing school students. The students from both vocational schools centers were more negative and more prejudiced to the vegetarians. These results also illustrate established hypotheses, of which it is clear after testing that girls show more positive relationships with vegetarians than boys, while the age of students does not play a significant role in their attitudes.

Due to the lack of empirical research and studies on socio-psychological and interpersonal aspects of vegetarianism, the obtained results were compared only with the research carried out in 2002 at Cornell University. The sample of respondents was slightly different – in the US those were college students with a significantly higher proportion of women, while our survey was aimed at students at secondary schools with approximately equal representation of girls and boys. However, the results of the US and our research did not differ much. Both surveys showed predominant positive attitude towards the vegetarians. Similarly, both showed that the positive approach prevails among women.

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The Attitudes of Health Education Teachers to Eating Disorders

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Abstract: In recent decades, the issue of eating disorders has been paid great attention not only in scientific literature but also research studies.

The paper describes selected results of a research study involving teachers in lower secondary schools.

The research instrument was the semantic differential. The research sample consisted of 168 teachers in lower secondary schools.

The research investigated the differences in the respondents' attitudes to eating disorders and their prevention by teaching qualification, gender, age and length of teaching experience. The results suggested more positive attitudes among unqualified teachers, although the results were not always significant. Those teachers who are not qualified in health education or family education perceive the issue of eating disorders more positively than teachers qualified in this field of study.

As far as gender is concerned, significant differences were identified; female respondents perceived the issue of eating disorders more positively. Increasing age and longer teaching experience of the respondents was not correlated with greater interest in the issue.

Keywords: attitude, teacher, eating disorders, health education, semantic differential, interview

The group that is most at risk of eating disorders includes girls and young women aged 13 to 25 years. At this age, many of them search for their place in society and among peers. In addition to other things, the school age brings significant changes in the attitude to one's body and eating habits. The fear of becoming obese and dietary tendencies affect younger age categories, especially among girls.

Appropriate education, particularly during the critical age of the onset of puberty, may act as a prevention of eating disorders in children. The fundamentals of prevention lie in the family, but schools should implement primary prevention measures to raise awareness among children, promote healthy eating habits, support a positive social climate, and last but not least provide suitable conditions for the development of the personality of each child and for strengthening their self-confidence in order to eliminate manifestations of self-destructive behaviour (Procházková et al., 2012).

The strategies that govern the attitudes and behaviour in all areas (including the attitude to oneself) gain their final form in adolescence. Besides the family, a significant role in the development of attitudes is played by social influences such as requirements placed by the school and society.

The importance in shaping the attitudes by the teacher is even greater today because sometimes the family fails to fulfil its functions and the school to a large extent replaces the function of the family. Therefore, it is important to identify whether the teachers have positive

attitudes to various forms of risk behaviour including eating disorders, because they should be the main advocates of the preventive measures mentioned above.

Prevention of risk behaviour

According to the authors, it is not necessary to provide a detailed explanation of eating disorders; therefore, this section focuses directly on the prevention of risk behaviour. The Ministry of Education, Youth and Sports (hereinafter referred to as MEYS) plays a crucial role in the implementation of school-based primary prevention of risk behaviours in children and youth in the Czech Republic. In shaping the personality of adolescents, the period of school education is very important; therefore, the prevention of risk behaviours in the school population is given special attention not only by MEYS but also other actors in the process of education. The prevention of risk behaviours in the school population under the auspices of MEYS primarily focuses on the prevention of risks in the following behaviours of children and youth: risk sports activities, injury prevention; risk traffic behaviour, injury prevention; eating disorders spectrum; delinquent behaviour; truancy; addictive behaviour, aggressive interpersonal behaviour, negative effect of sects, risk sexual behaviour, etc. (MŠMT, 2013).

The school cannot completely replace family upbringing, but should try to remedy or eliminate deficiencies that children bring into the school environment. Obviously, without mutual cooperation between the school and the family, the prevention of risk behaviours will be insufficient. Positive communication between parents and children, good relationships, but also attitudes to food and appropriate eating habits of the family remain the basis of eating disorders prevention. Nevertheless, the issue should not be underestimated in school, also because the period of adolescence is the most risky period for the emergence of eating disorders.

Health education teachers, prevention methodologists, school psychologists and other school personnel can greatly contribute to the prevention of eating disorders, but their potential is insufficiently used. The little success of some preventive programmes may result from the inability to identify the knowledge, values and attitudes of school employees concerning the prevention of these disorders. Possibly, they are not sufficiently informed about this issue and suitable methods of prevention of eating disorders. Moreover, their role of "specialists" might not protect them from making mistakes. The combination of these factors may have a significant impact on the success of preventive activities, especially with respect to possible inappropriate modelling and transfer of behaviour and attitudes to the learners.

To ensure effective prevention of eating disorders, the teachers must not only have outstanding theoretical knowledge about the issue but should also enhance their expertise by means of seminars, lectures or e-learning in order to develop positive attitudes to this issue. The approach focused on teacher education as a form of secondary prevention might improve their attitudes to the issue.

Attitudes

An attitude can be characterized as a "psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1998). An apt definition was provided by G. W. Allport (1967), who describes an attitude as a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon an individual's response to all objects and situations with which it is related. Globally, there are many definitions that differ in some aspects.

In accordance with the above, the teacher's attitude can be defined as a motive expressing the teacher's relationship with the child, a group of children, and especially the prevention of risk behaviours in the school environment. The research study focused on the teacher's relationship with the issue of eating disorders as a risk form of behaviour occurring especially among adolescents. The study is based on the assumption that without thorough knowledge of teachers' attitudes to this issue, where these attitudes are considered a heterogeneous complex of evaluation, feelings and conative tendencies, it is impossible to affect this area in a successful way or implement prevention measures among children. This type of research studies is highly topical, because the teacher's attitude can affect the learning activity of the child, which is confirmed in research studies by Helus, Pelikán (1984). Relevant literature resources include a tripartite model of attitudes, which was originally developed by Rosenberg and Hovland (Hewstone & Stroebe, 2006; McLeod, 2009):

1) The affective (emotional) component refers to emotional feelings that one holds toward an attitude object; adds a motivational character and governs the orientation of the attitude (e.g. "I like to implement the prevention of eating disorders.").
2) The cognitive component refers to beliefs that one holds about the attitude object (e.g. "The knowledge about the prevention of eating disorders is important for me.").
3) The behavioural (conative) component refers to overt actions and responses to the attitude object (whether positive or negative); a strong positive attitude produces greater commitment in favour of the attitude object, on the contrary, a strong negative attitude turns us away from the attitude object (e.g. "The prevention of eating disorders is insignificant for children.").

However, the basic definitions of attitudes mentioned above do not explain the circumstances of their origin or their properties. An important fact is that the attitudes of an individual develop, and what is observed relates only to a specific moment. Attitudes influence our conduct, thinking and behaviour. Attitudes are not innate but are products of learning that may change under certain conditions because all that is learned is conditional. In the course of life, an individual is member of a number of groups (e.g. the primary group is the family, the secondary group includes classmates, colleagues, friends, etc.), which undoubtedly affect the development and shaping of attitudes.

For the purposes of measuring attitudes, two basic approaches have been developed: axiomatic developed by Thurstone (1927), and psychometric, which is used more often. The psychometric approach uses three types of measuring methods. These are the Thurstone method, Likert scale, and semantic differential, which was used in the present research study.

The method of semantic differentiation (better known as the semantic differential) is a psychosemantic technique. Most of these techniques (incomplete sentences tests, verbal associations method, semantic selection method, and others) are used especially in psychology. The semantic differential method is one of the few used in educational research. This research method identifies how people (respondents) perceive various concepts. The respondents describe a phenomenon by assigning properties on a continuum of their extreme characteristics (e.g. good-bad, easy-difficult, useful-useless, etc.) Then the semantic differential is used to place the concept in a semantic space according to three dimensions (factors), i.e. the factor of evaluation, factor of strength, and factor of activity.

Using the semantic differential method, the concepts are assessed by means of a certain number of evaluation scales, mostly seven-point scales. C. Osgood recommended that each concept (indicator) be assessed by means of the following three factors: factor of evaluation, factor of potency, and factor of activity. The factor of evaluation denotes the good or evil of the concept, the factor of potency denotes strength, and the factor of activity denotes the

relationship of the concept with movement and changes. According to C. Osgood, if these three factors are defined for a specific indicator, its individual significance is specified. The significance of the concepts can be illustrated as points in a three-dimensional space identified as the semantic space (Chráska, 2003).

In the Czech Republic, attitudes have been analysed from an educational perspective using the semantic differential by Prof. Chráska, who focused on the attitudes of elementary and secondary school students to the educational reality, attitudes to school, learning and education of students at the end of compulsory school attendance, and attitudes of teacher training students to the teaching profession, etc. The attitudes of teachers to various issues are also analysed by other authors; for example Fialová (2011) dealt with the attitudes of teachers to the education of obese learners in elementary schools. Teachers' attitudes to the transformation of Czech education were analysed by Lazarová and Prokopová (2004). Teachers' attitudes to environmental issues were studied by Horáčková (2012). Reserved teachers' attitudes to further education as one of the risk factors of the curricular reform were addressed by Beran, Mareš, Ježek (2007). Havlík (2003) dealt with teachers' attitudes to their own preparation. Attitudes to further teacher education were analysed by Lazarová and Prokopová (2004). Students' attitudes and their changes as a significant part of teacher training were addressed by Chrásková (2012). Generally, attitudes are investigated by a number of professionals but research studies focusing specifically on teachers' attitudes to students are rare (e.g. Potměšil, 2010; Šafránková & Kocourková, 2011).

Although there are authors who examine teachers' attitudes to various issues, there are no available studies on teachers' attitudes to the prevention of eating disorders using the semantic differential in the Czech Republic or abroad.

1 Objective

The above implies that the role of the teacher in lower secondary education is crucial in terms of the development and shaping of students' attitudes to this issue. Should teachers influence their students in a positive way concerning this issue, they must have a positive attitude in the first place. The objective of the research study was to identify the attitudes of teachers to eating disorders and their prevention by qualification, gender, age, and length of teaching experience.

2 Methods

The research instrument was the semantic differential. At the beginning the demographic data were specified (gender, age, length of teaching experience, qualification, and subjects that the respondents teach). The research sample consisted of 168 teachers in lower secondary schools. The teachers were selected by means of total sampling in four regions. The respondents were health education teachers in lower secondary schools. The proportion of qualified health education teachers was 21.43% (n = 36); the proportion of unqualified teachers was 78.57% (n = 132). The lower number of qualified respondents was caused by the introduction of new subjects after the implementation of FEP EE in the school year of 2007/2008 (Man and health in primary schools, Health education in lower secondary schools). Therefore, shortly before 2007 some universities introduced a Health education course (for example Masaryk University in 2005, Faculty of Education, University of South Bohemia in 2008). The average age of the respondents was 42 years and ranged from 25 to 68 years; the average length of teaching experience was 13.5 years and ranged from 1 to 41 years of

experience. The number of female respondents was 149, of whom 32 were qualified; the number of male respondents was 19, of whom four were qualified.

A total of 15 conceptual indicators were selected (e.g. prevention of eating disorders, anorexia nervosa, teacher, student, person suffering from bulimia nervosa, etc.) For each indicator a seven-point scale was provided representing 19 bipolar terms (e.g. good–bad, easy–difficult, pleasant–unpleasant, light–heavy, dark–light, etc.) The assessment scales included both positive and negative items. For the purposes of statistical processing, the negative items were re-coded in a reverse order. Coding of the scale was performed by means of numbers from 1 to 7. At the beginning the demographic data were specified (gender, age, length of teaching experience, qualification, and subjects that the respondents teach). A total of 766 elementary schools with lower secondary education were addressed in the following regions: South Moravian Region (276 schools), Zlín Region (159 schools), Olomouc Region (181 schools), and Vysočina Region (150 schools). In all regions, the research sample included all schools according to the information provided by the Analytical and Statistical Department of the Ministry of Education, Youth and Sports as of September 2012. A total of 168 questionnaires were returned, which equals 21.93%.

The attitudes to the prevention of eating disorders were identified by means of the semantic differential, which comprised a section focusing on the attitudes (nine indicators with 11 scales) and a demographic section. The assessment scales included both positive and negative items.

To identify suitable statistical methods, tests of normality were performed for all nine indicators, specifically the Kolmogorov–Smirnov test, which suggested the application of parametric statistical methods.

To verify construct validity, the usual explorative factor analysis was used, where (unlike the traditional C. Osgood's semantic differential) only two common factors were extracted (calculations were made using the STATISTICA Cz 10.0 computing system). The factor structure of the scales was also verified by a factor analysis of the results of individual conceptual indicators. This analysis was used to verify that the factor structure of the scales was identical with the structure obtained by an analysis of the results of all indicators.

The differences between the groups of independent variables were identified by means of an analysis of variance (ANOVA), which was followed by the Tukey post-hoc test to specify any differences between the groups of variables.

The research instrument was tested for reliability and validity, which is a usual method of determining the characteristics (Hendl, 2004). Reliability was identified by means of Cronbach's alpha. In all nine indicators, the value ranged from $\alpha = 0.67$ to 0.89, which indicates a high degree of reliability of the research instrument and the structure of the indicators. Another method used to verify construct validity is a factor analysis according to McDonald (1991). Based on a factor analysis, a total of nine conceptual indicators with an 11-point scale were identified that showed a high degree of factor stability and purity. The remaining indicators showed insufficient purity and were removed from the research.

The main objective of the dissertation research was to identify teachers' attitudes to the prevention of eating disorders. The main objective was achieved by means of several sub-objectives, including literature search on attitudes, analysis of the current state of the issue in the Czech Republic and abroad, identification of a suitable research instrument, statistical data processing, and verification of hypotheses.

The purpose of additional objectives was to identify the effect of gender, qualification, age, and length of experience on teachers' attitudes to the prevention of eating disorders. Based on

the additional objectives, the effect of these variables was examined and research questions formulated. Regarding the focus of the dissertation, which has to our knowledge not been subject to domestic or international research, the research questions were based on general research on attitudes to various objects. Various studies on attitudes often test variables that were also used in the present research. These variables are respondents' gender and age.

Research questions:

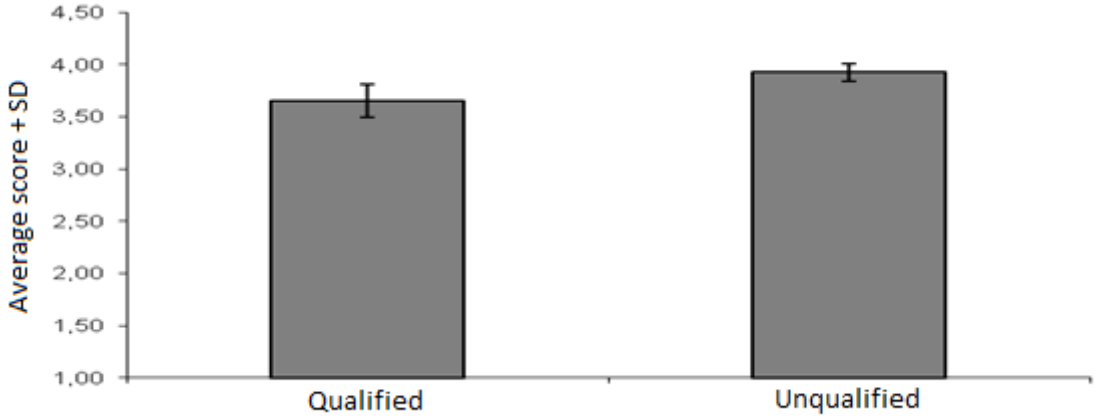
1) Are the attitudes to the prevention of eating disorders different between women and men?
2) Are the attitudes to the prevention of eating disorders affected by teaching qualification?
3) Are the attitudes to the prevention of eating disorders affected by the age of the teacher?
4) Are the attitudes to the prevention of eating disorders affected by the length of teaching experience?

The research questions were used to formulate the following hypotheses:

- H1: Women have more positive attitudes to the prevention of eating disorders than men.
- H2: Teachers qualified in health education have more positive attitudes to the prevention of eating disorders than unqualified teachers.
- H3: With increasing age, teachers' attitudes to the prevention of eating disorders become more positive.
- H4: Teachers with longer teaching experience have more positive attitudes to the prevention of eating disorders than teachers with shorter teaching experience.

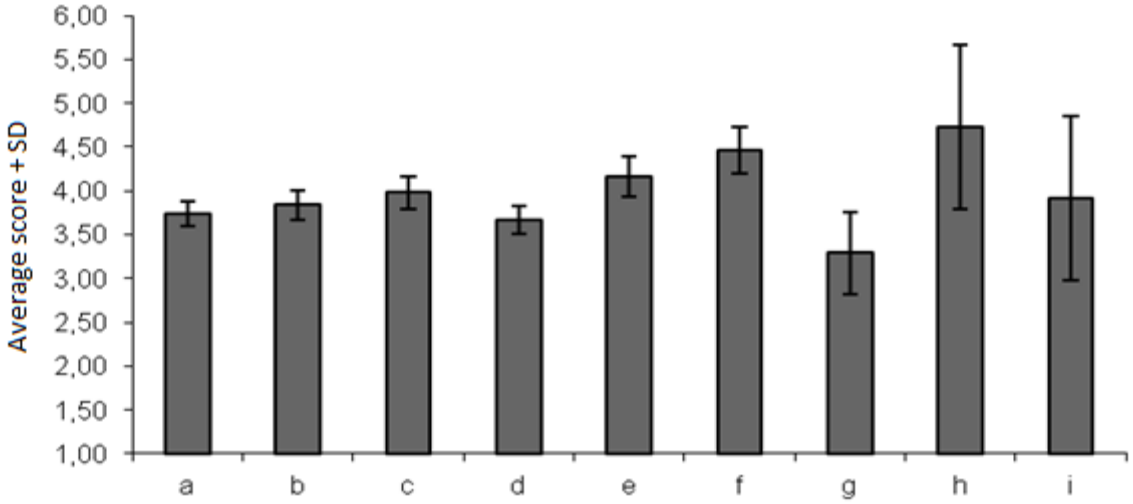
3 Results

Regarding the limited number of pages, the results of the research study are shown in several graphs together with a brief summary under each graph.



Graph 1. Teachers' attitudes to the indicator of implementation of eating disorders prevention by qualification.

The results in Graph 1 suggested a more positive attitude among unqualified teachers although the results were not always significant. Those teachers who are not qualified in health education or family education perceive the issue of eating disorders more positively than teachers qualified in this field of study.

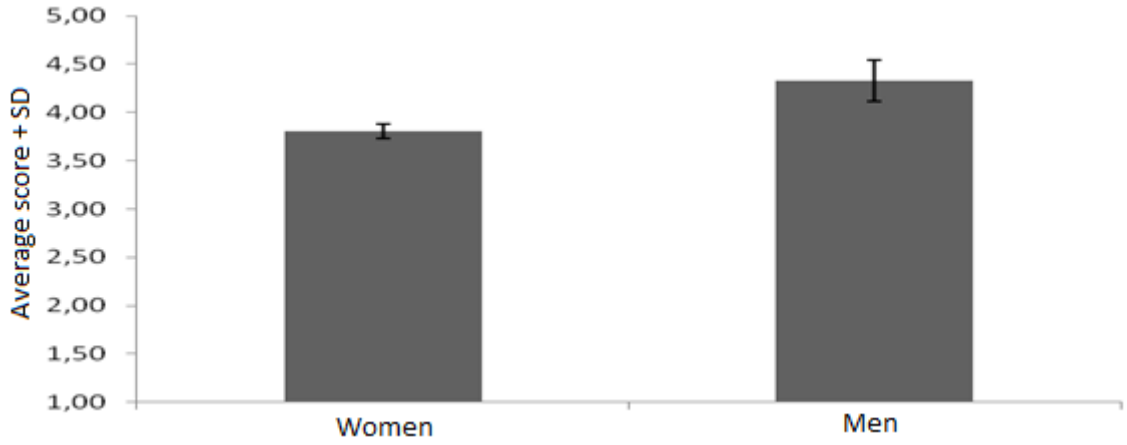


Graph 2. Teachers' attitudes to the indicator of implementation of eating disorders prevention by length of teaching experience.

Explanatory notes:

a – length of experience 1–5 years; b – length of experience 6–10 years; c – length of experience 11–15 years; d – length of experience 16–20 years; e – length of experience 21–25 years; f – length of experience 26–30 years; g – length of experience 31–35 years; h – length of experience 36–40 years; i – length of experience 41–45 years;

No statistical significance in Graph 2 was observed for the indicator ($F = 1.47$; $p = 0.17$). The least positive attitude to the indicator of implementation of eating disorders prevention was reported by teachers with experience of 31 to 35 years. The most positive attitude was reported by respondents with experience of 36 to 40 years. In this context, it could be interesting to compare qualified and unqualified teachers with different lengths of teaching experience. This was, however, not analysed in the present research study.



Graph 3. Teachers' attitudes to the indicator of implementation of eating disorders prevention by gender.

For the indicator of implementation of eating disorders prevention, statistical significance was observed at a level of ($F = 5.14$; $p < 0.05$). As shown in Graph 3, more positive attitudes to this concept were reported by men. It is possible that men notice the growing problem of eating disorders not only in the media but also in the school environment, and therefore have a more positive attitude to this issue.

Other core results are briefly summarized as follows. It was observed that increasing age of the respondents was not associated with more positive attitudes to the issue. Positive attitudes to this issue were observed also during the semi-structured interviews. The respondents were aware of the importance of the issue and the need for preventive measures. In their professional career, four out of ten respondents have encountered a girl with an eating disorder and tried to resolve the situation.

4 Summary of results and discussion

The objective of the research study was to identify the attitudes of elementary school teachers to the prevention of eating disorders. In addition to the main objective, the study examined the effect of demographic variables including gender, qualification, age, and length of teaching experience.

The first hypothesis assumed an effect of gender on the attitudes to the prevention of eating disorders. This hypothesis was confirmed because an analysis of variance suggested statistically significant differences between the attitudes of women and men. Women had more positive attitudes in six indicators out of nine. As suggested by the results of other studies (Krch & Drábková, 1996; Janout, Kolárová, & Němečková, 2001; Csémy, Krch, & Provazníková, 2005), eating disorders are significantly more frequent in girls and women; therefore, a more positive attitude of women to this issue is expected. Interesting findings were observed in the indicator I as a teacher. The responses relating to this concept were below average in both genders (considering the scale value of 3.5 in the seven-point scale an average value). Similar results were also formulated by Chráska (2003), who investigated the attitudes to the teaching profession in the context of undergraduate teacher preparation. Women had a more positive attitude to the teaching profession compared with men, which was also confirmed by other authors, for example Průcha (2002). A more positive perception in women was also observed in other indicators, e.g. school, self-confidence, family.

The purpose of the second hypothesis was to confirm or refute the assumption that qualified health education teachers have more positive attitudes to the prevention of eating disorders. An analysis of variance suggested statistically significant differences in the following prevention indicators: I as a teacher, student, teaching profession, and self-confidence. In seven out of nine concepts, more positive attitudes were observed in unqualified teachers. In the remaining two indicators the perception of qualified and unqualified teachers was almost identical. The hypothesis was refuted and a possible explanation is provided below. It is true that health education is a relatively new discipline in Czech universities. The average length of teaching experience of qualified teachers was only seven years because the group of qualified teachers included those who were qualified in family education, which preceded health education and was of a similar concept. Health education is included in the Framework educational programme for elementary education as a compulsory subject with one lesson per week in any two grades of lower secondary school. Teachers of this specialization are educated in a multidisciplinary field of study, which includes not only understanding of the issue of health but also other broad activities such as prevention of risk behaviour (smoking, alcohol, eating disorders, drug issues). As suggested by the results of research studies performed by students of health education in elementary schools (so far unpublished),

teachers qualified in health education usually do not teach this subject in elementary schools because it is considered an additional subject taught by teachers with FTE lower than 1.0. Therefore, an interesting and satisfactory fact is that unqualified teachers have positive attitudes to the prevention of eating disorders.

The third hypothesis, assuming that increasing age is associated with more positive attitudes of teachers to eating disorders, was refuted on the basis of the results of an analysis of variance and the Pearson correlation coefficient. Statistical significance was not observed in any of the indicators and an association between more positive attitudes and increasing age of the respondents was not confirmed. The results of the present study suggest that many teachers lack further (extension) theoretical study and the ability to absorb the process of transformation of the system of education. The authors of the present study tend to agree with Gavora (2000) that it is necessary to respect the personality of the teacher and that it would be desirable in the future to combine quantitative and qualitative methods and analyse teachers' life stories to better understand the issue.

The fourth hypothesis assumed that teachers with longer teaching experience had more positive attitudes to the prevention of eating disorders than teachers with shorter teaching experience. The most positive attitudes in six out of nine indicators were reported by respondents with experience of 36 to 40 years. If the intervals of the length of experience category were not five years but for example 10 years, the results would probably be similar, i.e. that increasing length of teaching experience does not affect more positive attitudes of teachers to the prevention of eating disorders. Spurná (2013) focused on educational research from the perspective of elementary and secondary school teachers. The author formulated identical conclusions as the authors of the present paper, although the issue was different. She observed neutral attitudes, which were affected by intervening variables (such as gender, length of teaching experience, etc.) and factors extracted from the responses. For this reason, the present quantitative research study included an additional research method – a semi-structured interview. The results of the interviews are not presented in this paper.

5 Conclusions

The objective of the research study was to identify the attitudes of teachers in lower secondary schools to the prevention of eating disorders. The sub-objectives focused on the effect of gender, age, qualification, and length of teaching experience on the development of the respondents' attitudes. The results suggested more positive attitudes among unqualified teachers, although the results were not always significant. Those teachers who are not qualified in health education or family education perceive the prevention of eating disorders more positively than teachers qualified in this field of study.

As far as attitudes by gender are concerned, more positive attitudes to the prevention of eating disorders were observed in women. A gender-based comparison revealed more positive attitudes of women in six out of nine indicators. It was observed that increasing age of the respondents was not associated with more positive attitudes to the issue. The length of teaching experience had no effect on the attitudes to the prevention of eating disorders.

Teachers of health education or an equivalent subject have a formal and informal access to a large number of young people in an environment that stimulates discussion and provides space for education concerning a healthy lifestyle, a positive relationship of students to their own body, prevention of negative effects of the media and advertisements, and health risks associated with eating disorders. Teachers' positive attitudes to the prevention of eating disorders are important because these teachers will then support preventive programmes in their schools.

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Myths in Nutrition

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Abstract: A false irrational judgement based self-delusion created on subjective feelings of an individual or by a mechanical accepting of baseless information is considered as a myth. Selected myths refer to the following groups of food: fat, milk and dairy products, meat and meat products, fruit and vegetables, cereal.

The main objective of the research was to answer the following question: Do the respondents understand the selected statements about nutrition as true or not?

The research method was a questionnaire of its own design. Among the statements that respondents believe to be true include: milk fills up with mucus, milk from a shop is thinned by water, milk "directly from a cow" is healthier, present-day yoghurt is not real yoghurt, processed cheese contains cheap margarine, meat is full of antibiotics and growth hormones, raw chicken meat contains less fat than pork, spinach contains a lot more iron than other green vegetable, brad made of leavening (without yeast and other substances) is valuable nowadays.

The results of the questionnaire survey are in line with people's long-term views on food and nutrition.

Key words: myths, nutrition, food

Myths are a common part of particular cultures and are accepted in various forms by social groups. Myths affect their behaviour and the deciding of people in society. P. Hartl and H. Hartlová state: "A myth is a term for a mythical interpretation of natural and social phenomena, their cause and origin, associated often with supernatural beings." (2004, p. 337) We can state that a myth is a false irrational judgement based self-delusion created on subjective feelings of an individual or by a mechanical accepting of baseless information. Nowadays myths are spread among public and in many cases by means of media. According to our opinion there are several reasons why myths come into existence:

- Because of satisfying the need of safety people create their own ideas and opinions about what they eat and what food they buy. These opinions are very often in harmony with their eating habits; in some cases they give rational reasons why to eat particular food. For example: beer is an ion drink, ect.
- The problem of nutrition and food is very complicated. Even if there are many accessible information, for example on the wrapping, internet, technical publication, ect. in many cases, people misinterpret them.
  The information about food is spread by other groups with different hobbies and opinions. It could be supporters of alternative nutrition (for example: nutrition according to blood groups) or the producers and traders of particular food (for example: jelly sweets contain calcium and vitamin C.).

There are myths to almost any kind of food (Oliveriusová, 2003). Individual myths will be presented according to what kind of food they are referring to.

Myths about fat:

- Plant fat is healthy, animal fat is not.
- If I want to lose weight, I cannot eat any fat.
- Palm fat doesn't contain any beneficial substances.
- Margarines have bad effect on digestive system and contain harmful substances (transfigure fatty acids) (Dostálová & Málková, 2012, p. 87).

Myths about milk and dairy products:

- Milk fills up with mucus.
- Milk is not suitable for people. Human is the only mammal drinking milk of some other mammal.
- Milk from a shop is thinned by water.
- Milk "directly from a cow" is healthier.
- Present-day yoghurt is not real yoghurt.
- Processed cheese contains cheap margarine (Kopáček, 2010, p. 14–15).

Myths about meat and meat products:

- Meat is full of antibiotics and growth hormones.
- The colour of meat must be always red.
- Chicken meat contains less fat than pork (Uhlířová, 2014a, p. 11–15).

Myths about fruit and vegetables:

- Preservation of fruit and vegetables destroys all healthy substances.
- Spinach contains a lot of iron.
- Artificial substances are added to vegetables (for example tomatoes) because of ripening (Šrámková, 2010, p. 14–15).

Myths about grain:

- Gluten-free diet is healthy for everybody.
- Soft bread, good bread.
- Brad made of leavening (without yeast and other substances) is valuable.
- Dark pastry is healthy and suitable for everybody (for example: children, older people) (Uhlířová, 2014b, p. 11–15).

There are many myths about food and nutrition. The most common and basic ones were selected in the frame of this paper.

1 Objectives

A research problem was formed for the purpose of the research. It is possible to define it as a formulation that expresses the relationship between two or more phenomena (variables), which are in the focus of the research. P. Gavora (2000, p. 24). The research problem is:

Do the respondents understand the selected statements about nutrition as true or not?

The aim of the research is to get an answer to the above-mentioned research question.

2 Methods

The research problem was verified by the following questionnaire. The full text of the questionnaire is given in Table 1.

Table 1

Research questionnaire

Question number	The question	Choice of answer	
1.	Plant fat is healthy, animal fat is not.	YES	NO
2.	If I want to lose weight, I cannot eat any fat.	YES	NO
3.	Palm fat doesn't contain any beneficial substances.	YES	NO
4.	Margarines have bad effect on digestive system and contain harmful substances (transfigure fatty acids).	YES	NO
5.	Milk fills up with mucus.	YES	NO
6.	Milk is not suitable for people. Human is the only mammal drinking milk of some other mammal.	YES	NO
7.	Milk from a shop is thinned by water.	YES	NO
8.	Milk "directly from a cow" is healthier.	YES	NO
9.	Present-day yoghurt is not real yoghurt.	YES	NO
10.	Processed cheese contains cheap margarine.	YES	NO
11.	Meat is full of antibiotics and growth hormones.	YES	NO
12.	The colour of meat must be always red.	YES	NO
13.	Raw chicken meat contains less fat than pork.	YES	NO

14.	Preservation of fruit and vegetables destroys all healthy substances.	YES	NO
15.	Spinach contains a lot more iron than other green vegetable.	YES	NO
16.	Artificial substances are added to vegetables (for example tomatoes) because of ripening.	YES	NO
17.	Dark pastry is healthy and suitable for everybody (for example: children, older people).	YES	NO
18.	Gluten-free diet is healthy (beneficial) for everybody (it should be part of a common eating habit).	YES	NO
19.	Only soft bread (when touched), good – fresh bread.	YES	NO
20.	Brad made of leavening (without yeast and other substances) is valuable nowadays.	YES	NO

The respondents of the questionnaire are people in the age between 30 and 60. This range was chosen on the grounds of a conclusion that this age group acquires information about nutrition from ordinary media (television, radio, internet, ect.) and take an active interest in the issues.

The administration was made on the grounds of willingness of the respondents to take part in the questionnaire. It was done in the form of a survey, i.e. direct questioning in the principle of a personal interview. The respondents are from the Pilsner region. The data were collected in the period February – June 2018. Table 2 shows sample characteristics of respondents by gender.

Table 2

Description of research file

Total number of respondents	540
Men	142
Women	398

3 Results

The research results are presented through the absolute and relative frequency. The results are summarized in Table 3.

Table 3

Absolute and relative frequency of the results from the questionnaire

Question number	Absolute frequency N		Relative frequency %	
	Choice of answer		Choice of answer	
	YES	NO	YES	NO
1.	112	428	21	79
2.	98	442	18	82
3.	315	225	58	42
4.	375	165	69	31
5.	422	118	78	22
6.	183	357	34	66
7.	463	77	86	14
8.	422	118	78	22
9.	458	82	85	15
10.	499	41	92	8
11.	472	68	87	13
12.	282	258	52	48
13.	508	32	94	6
14.	64	476	12	88
15.	402	138	74	26
16.	278	262	51	49

17.	76	464	14	86
18.	65	475	12	88
19.	82	458	15	85
20.	501	39	93	7

It is clear from the questionnaire that the respondents think that some of the suggested statements about food and nutrition are true. To the statements that the respondents think are true (relative frequency 70% and more at the answer YES) belong:

- Milk fills up with mucus.
- Milk from a shop is thinned by water.
- Milk "directly from a cow" is healthier.
- Present-day yoghurt is not real yoghurt.
- Processed cheese contains cheap margarine.
- Meat is full of antibiotics and growth hormones.
- Raw chicken meat contains less fat than pork.
- Spinach contains a lot more iron than other green vegetable.
- Brad made of leavening (without yeast and other substances) is valuable nowadays.

To the statements that the respondents think are not true (relative frequency 70% and more at the answer NO) belong:

- Plant fat is healthy, animal fat is not.
- If I want to lose weight I cannot eat any fat.
- Preservation of fruit and vegetables destroys all healthy substances.
- Dark pastry is healthy and suitable for everybody (for example: children, older people).
- Gluten-free diet is healthy (beneficial) for everybody (it should be part of a common eating habit).
- Only soft bread (when touched), good – fresh bread.

4 Conclusions

It is important to mention that the results of the questionnaire can be influenced by factors that negatively affect the validity and reliability of the research. These factors can be: various knowledge of the respondents about food and nutrition, various motivation of the respondents to the filling out of the questionnaire, the way of administration of the questionnaire (questionnaire of own construction and the personality of the administrator), etc.

One of the possible ways how to increase the awareness of the right nutrition habits effectively and how to minimize the occurrence of "myths" about nourishment of the

incoming generation suggests itself in education specifically in the branch of Health education. Hřivnová (2014) states that educationalists of this branch devote their attention to this problem of "nutrition" in exact 35%.

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Energy Drinks in the Drinking Regime of Adolescents

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Abstract: Energy drinks are popular products to cover the body claims of liquid intake mainly for young age categories. Their influence on human body is worth further discussion and their regular use can bear some risks.

The aim of this work was to find out about the frequency of energy drinks use and the reasons why adolescents drink them.

The analysis comes out of a quantity survey and was carried out in the form of questionnaire survey. The questionnaire contained 27 open and half-open questions.

The research sample consisted of 645 respondents. Out of these, 71.47% consumes energy drinks; 62.85% consumes them at least once a month and 4.88% every day. Males consume energy drinks much more often than females.

Current use of energy drinks throughout the population is very high and is rising. The impact of energy drinks usage on human body during a long-term consumption is a subject to current research. The amount of energy drinks used without risks to human body cannot be clearly stated.

Key words: drinking regime, analysis, energy drinks, adolescence

The consumption of energy drinks has significantly risen in the past twenty years. There are more than 500 types of energy drinks in the market today and their sales are a lucrative business. Energy drink is a valuable market article and in single year 2017 the energy drink market profit grew up to USD 55 billion; with the Red Bull company selling 6.3 million cans of their energy drink. This trend is accelerated by an aggressive marketing and communication strategy. It promotes mainly the effects energy drinks have on human body, which means increase in physical and mental performance. The target group it focuses on are not only athletes but also young population. The covers get more interesting and trendier; and they feature sports celebrities, musicians, fairy-tale characters or fear-evoking motives.

There are scientific studies opposing the producers' affirmations which claim the drinks are harmless. These studies present the suitability and safety of using these drinks. It is believed that these drinks support physical activity and positively influence sports performance. The effect of energy drinks is a result of synergic actions of individual components the drink contains. Excessive and non-coordinated use might have fatal consequences mainly with children and youth.

Neither Czech Republic nor European union have defined the term energy drink. Up to now, emery drinks have been placed between non-alcoholic drinks enriched by vitamins and minerals and other food additives (Bromová et al., 2010). Energy drinks in the Czech Republic are subject to law n. 180/2016 of the Code., which changes law n. 110/1997 of the Code about foods and tobacco products and about the change and amendments of some connected laws with their future regulations and other connected laws (Příručka pro provozovatele potravinářských podniků, 2018) Czech legislation places energy drinks between non-alcoholic drinks, which are enriched in e.g. glucuronolactone, taurine, vitamins, plant extracts and other additives. There are limits set for caffeine (320 mg/l),

taurine (4000 mg/l), inositol (200 mg/l) and for glucuronolactone (2400 mg/l) (Vodička & Cabada, 2011). Ordinance n. 282/2016 of the Code, about the requirements for foods that can be advertised and sold in schools and educational premises, also deals with a certain sense of energy drink characteristics and use. The main aim of the ordinance is to limit the sales of unhealthy foods in school canteens and food machines in basic schools and the lower grades of eight-year-long grammar schools. The ordinance prohibits sales of foods and drinks containing artificial sweeteners, caffeine, trans fatty acids, energy and activating drinks and non-alcoholic drinks containing higher amount of sugar than 4 grams in 100 ml. It will only be possible to offer and sell foods whose nutrition values correspond with healthy food principles (MŠMT, 2018).

Nowadays, energy drinks are holding a significant part of the market consumption. They remain controversial but without any doubt a very successful and profitable item for the future. This is proven by the statistics from 2015, when the world sales of energy drinks were USD 42.017 billion (Starling, 2016). In 2017 the revenue reached USD 55 billion and it is estimated that it will grow of further 3.7% in the years 2018–2023 (Energy drinks market, 2017).

The retail sales revenue of energy drinks in Czech Republic increased, in comparison with the previous year, for 13% in 2017. This analysis was carried out in grocers' shops excluding wholesale market Makro and petrol stations (Agris.cz, 2018). There were 130 different kinds of energy drinks registered in the Czech Republic in the period between 2005 and 2010, both made in the Czech Republic or imported from different European and non-European countries (Winklerová, 2010, p. 48–49). The highest prevalence of consumption of these drinks was with adolescents – 82%. The lowest percentage of drinks consumed by adolescents was in Greece (48%). The age group which consumed most energy drinks was between ages 15 to 18 (73%) rather than younger teenagers. The average consumption reached the values of 2.1 litres per capita per month. About 12% of adolescents consumed energy drinks regularly, at least 4 or 5 times a week or more often with the average monthly consumption reaching 7 litres of energy drinks per month. The survey also shows that 12% of adolescents also drank at least one litre of energy drink at one go. The use of energy drinks along with an alcoholic drink was stated in 53% of adolescents.

The prevalence of consumption of adult users was 30%. Energy drinks were consumed mainly by adults aged between 18 and 29. In average, adults have used 2 litres of energy drinks per month. Around 12% of adults consumed energy drinks 4 or 5 times per week and more and they drank 4.5 litres of the drinks per month. Around 11% of adults drank at least one litre of energy drink at one go. The use of energy drinks along with alcohol was found with about 56% of adults.

The prevalence of energy drinks consumption of children aged 3 to 10 was about 18%. The weekly consumption was 0.49 litres. There were 16% of highly active users between the ages 6 to 10, and their weekly consumption was about 0.95 litres (nearly 4 litres per month) (Evira.fi, 2016).

Energy drinks a stimulation drinks with a wide spectre of ingredients. However, the basis for each drink is water, CO2 used for their carbonation and a stimulating element. In different types of drinks, you can find mainly caffeine, taurine glucuronolactone, a king of artificial sweetener (glucoses, fructose. acesulfame K, aspartame, saccharoses, sucraloses), vitamins (group B) with a different absorption rate. Based on their trademark, the energy drinks also contain other ingredients like amino acids, minerals and plant extracts, acids (lemon, wine) with a different absorption level, preservatives and colourants (Higgins, Tuttle, & Higgins, 2010).

1 Objectives

The partial objectives of the work was to find out the consumer segment of the adolescent population in the Czech Republic with the reasons to classify the energy drinks into the drinking regime and to determine the preferred brand of the most used energy drinks.

2 Methods

The data was obtained through an electronic form of a questionnaire which had its own design and was distributed online from April to May 2018 at the web page Vyplňto.cz. The questionnaire contained 27 open and semi-open questions. The time required to fill it was between 3 and 4 minutes. The questionnaire was anonymous, identical for women and men, and all age groups belonging to adolescence. Macek (2003) states that adolescence can be considered until the age of 24. The research team consisted of 645 respondents, 451 men and 194 women between the age from 15 till 24 years old.

3 Results

The major part of the monitored sample has experience with the consumption of energy drinks – 71.4% (Figure 1).

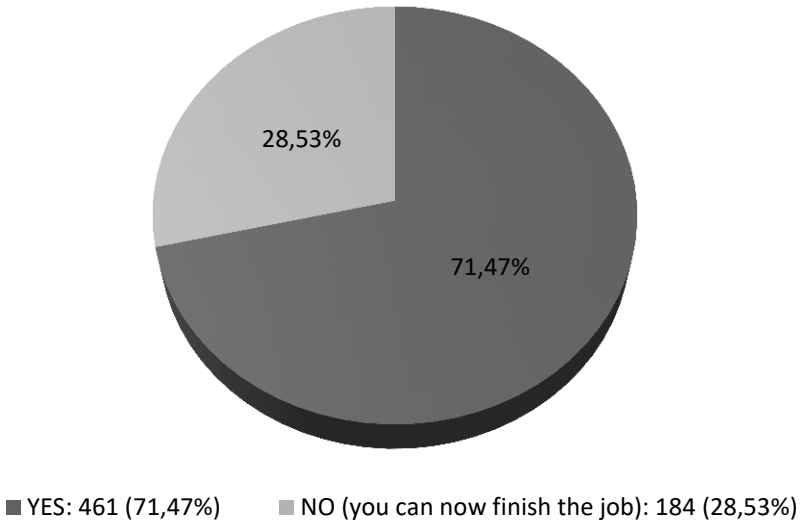

Figure 1. Consumption in adolescent population from the Czech Republic, n = 645.

Due to the composition and effects of drinks, this is a startling survey. Energy drinks are stimulating beverages with a wide range of components. Even though the base is formed by water, the positive quality of water as the most important part of the drinking regime degrade the added components mostly on a synthetic basis. First of all we can find in energy drinks: taurine, caffeine, glucuronolactone, artificial sweeteners (aspartame, acesulfame K) and sugars of varying absorption rates, even the various kind of vitamins B. According to the kind of drink we can also find there minerals, plant extracts, preservatives, flavorings and colourings (Higgins et al., 2010).

The content of active substances in the beverage is related with its own effect on the organism, where we can generally state, that energy drinks affect more or less all functional systems in the body. That causes mostly the high amount of added substances and their effect on the body. Energy drinks contain 32 mg of caffeine per 100 ml of the beverage.

After consumption of caffeine, it passes into the stomach and intestinal walls. The maximum caffeine concentration in the blood stream is already after 60 minutes. Thanks to the circulation of blood and its hydrophobic quality, it penetrates membranes and spreads throughout the whole body. It penetrates into saliva, milk and bile. Only 1–2% of non absorbed caffeine appears in the urine. Caffeine is metabolized in the liver by a number of enzymes (Grundmann, 2001).

The half-life of caffeine in the body is averaged 4 hours and it is excreted in the urine. Caffeine is completely eliminated from the organism after 24 hours (Krejčí, 2000). Effects of caffeine are now very good described, but the results of studies often have conflicting conclusions. Pendell (2005) reports that caffeine acts as an insecticide as it disrupts replication of reproductive DNA. Caffeine also isn't suitable for hypertonics and cardiacs, and it reduces the effect of some antiepileptic drugs (Weiβ, 2007).

High level of caffeine can then cause insomnia, restlessness and colic at the child age (Pendell, 2005). The link between cancer and caffeine has been the subject of many studies. It is reported that caffeine may be a risk factor for bladder cancer, cancar of pancreas and ovarian cancer. However, this assertion hasn't been confirmed. Contrarily it is veryfied, that caffeine reduces the incidence of colorectal cancer and other malignant tumor (Vyskočil, 2007). Experimental and clinical studies have confirmed that caffeine increases the concentration of adrenaline, noradrenaline and cortisol. Caffeine can cause increased sensitivity to stress, anxiety disorders and depression passing time. This is due to increased production of cortisol after caffeine consumption. Cortisol is then accumulated in the Hippocampus and in other important centers of the brain. The result is chronic stress deregulation, depression and short-term memory damage (Magazínzdraví.cz, 2013).

Another effective ingredient in energy drinks is taurine. It is assumed that taurine has a significant effect on the cardiovascular system, thereby improving the activity of the heart. It also has an effect on skeletal muscle, where it increases efficiency capacity and physical abilities (Smith & Pharm, 2000). It is also present in the central nervous system (CNS), pancreas, liver, eye retina, platelets and neutrophils (NCBI, 2004). Another ability of taurine is its ability to imitate the function of insulin, thereby improve the use of carbohydrates by a similar mechanism without reducing blood sugar or hypoglycaemia as with insulin. In energy drinks, it acts as an energizer because it multiplies the effect of caffeine many times (Bromová et al., 2010).

Here we can have very successfully doubts about benefits of using energy drinks as part of a drinking regime. 71.47% is a high number in this case, but the most important aspect in this context is the frequency of using an energy drink. These figures are provided in Chart 2 (Figure 2).

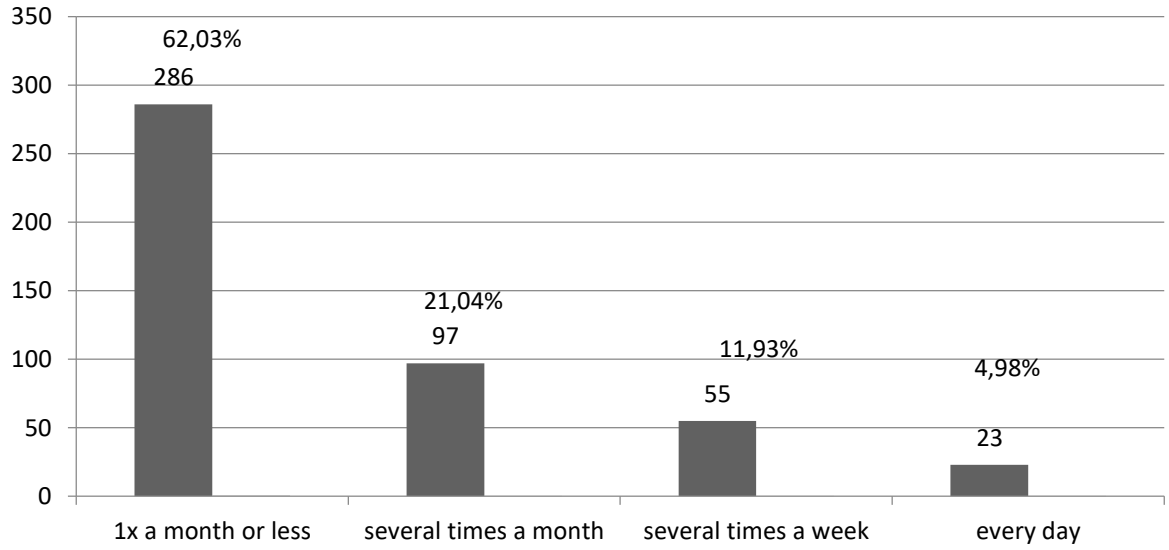

Figure 2. How often do you consume energy drinks? n = 461.

The most significant quotient of respondents – 62% – uses energy drinks one a month. It is possible to talk about using the potential of energy drinks to increase physical and mental potential in this case. However, even at this low frequency, it is not possible to avoid the health risks associated with the consumption of energy drinks. Ingestion of an energy drink before or during training may have a serious unwanted effects, particularly restlessness and irritability, may also increase blood pressure and it could lead to dehydration. A double-blind study of 68 healthy students at various universities showed that Red Bull had lowered blood pressure changes and increased the pain threshold for participants during the stress test (cold pressure test). At almost 5% of respondents, energy drinks are consumed on a daily basis. Here we can talk about the high risk of inception of health problems, although the effects on the body have not been determined with long-term use of energy drinks (Higgins, 2010).

We can point here to the genesis of a dependence syndrome, which is defined as a group of physiological, behavioral and cognitive phenomena, in which the use of an addictive substance or category of substances has a much greater preference than another acting, that had been valued more before. The central descriptive characteristic of addiction syndrome is the desire (often strong, sometimes overwhelming) to take psychoactive substances (which can be, however, they don't have to be prescribed medically), alcohol or tobacco (Nešpor, 2005). Due to the high caffeine content, the dependence syndrome is also apparent in respondents consuming energy drinks at a frequency several times a week (11.93%) or several times a month (21.04%).

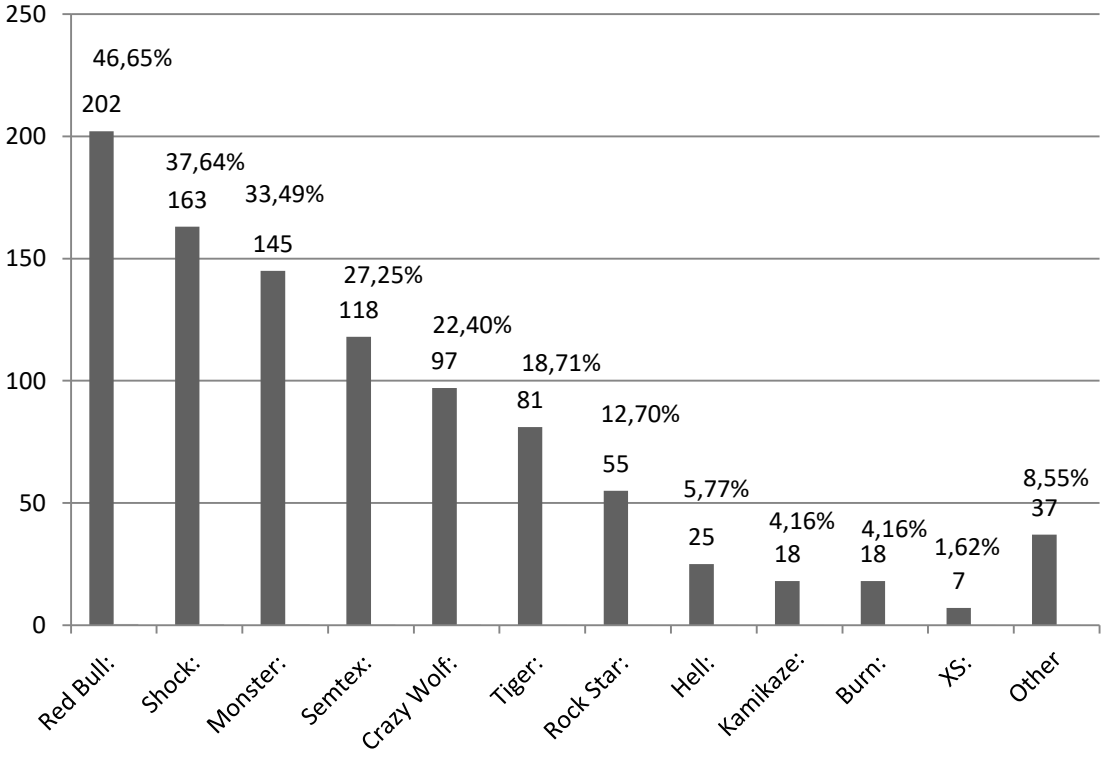

Figure 3. Preferred mark in the adolescent population from the Czech Republic, n = 461.

The frequency of consumption is also related to the preference of particular trademark of the energy drinks – graph 3 (Figure 3). From the viewpoint of composition, they are mostly very similar, rather identical products, where similar effects can be expected. Nevertheless brand preferences are different. Respondents could give more answers here. It isn't surprise, that the trademark Red Bull has the highest preference. 46.65% of respondents rated Red Bull as the most preferred. 37.64% of respondents said Shock and 33.49% marked Monster. It should be noted that the Shock trademark has only 500 ml packs on the market, which may increase the intake of active substances in the energy drink. Red Bull's high preferences are also reflected in its trade balance, since its establishment in 1987, the Austrian company has expanded to 171 countries around the world, sold 68 billion cans of beverage to their consumers and employs nearly 11 900 people. Only in the year 2017, the company turnover was € 6.282 billion and 6.3 billion cans of energy drink were sold (Energydrink.cz, 2018).

Producers of energy drinks promote their products on the basis of their marketing-proven extraordinary effects that bring success at sport, employment and in society. Based on this, it was possible to expect that respondents would use beverages primarily to be so-called "COOL". However, the results presented in Figure 4, show completely different reasons for consumption.

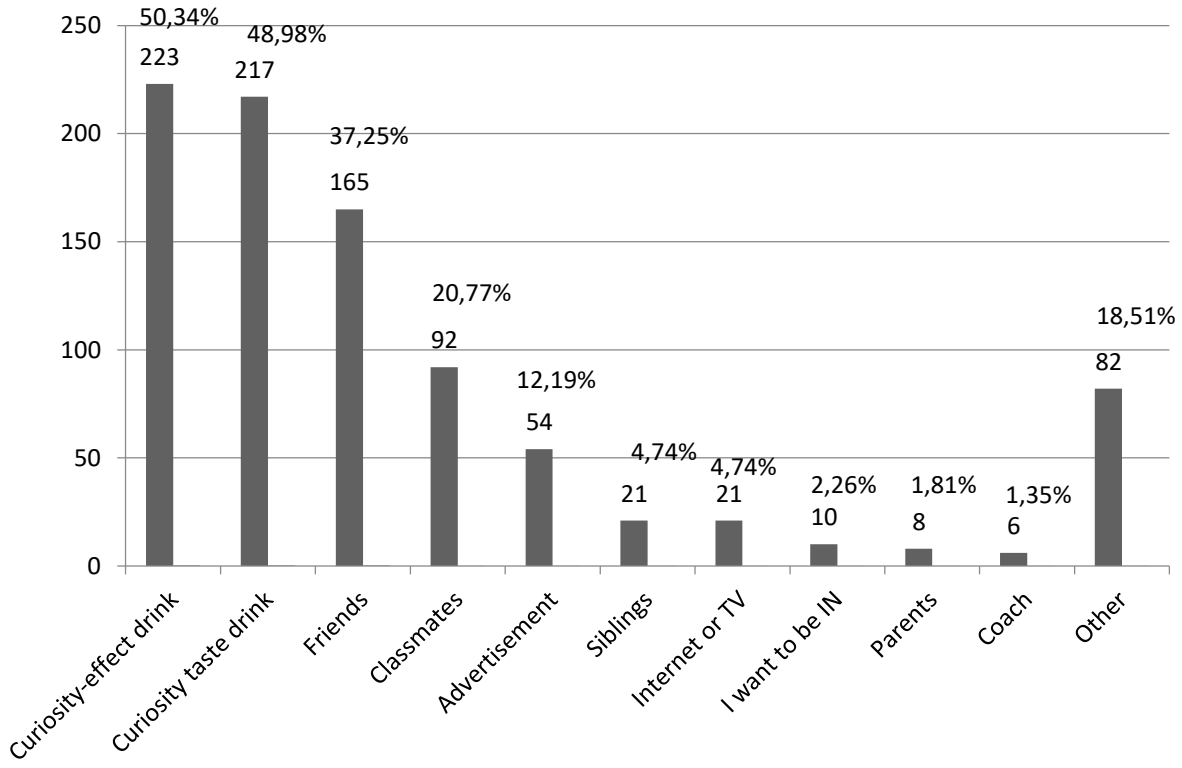

Figure 4. Reason for consumption in adolescent population from the Czech Republic, n = 461.

Respondents could fill out more answers. The most frequent answer was to test the effects of energy drinks, which was mentioned in 50.43% of responses. The second most common answer was to test the taste of energy drinks, which was reported in 48.98% of responses. The third most common answer is consumption based on a friend's recommendation. This option was chosen in 37.25% of responses. According to the answers, which were given by adolescents, it is possible to judge the consumption of energy drinks with a certain amount of adventure. Adolescence is accompanied by a higher incidence of risky behavior. Any behavior of adolescents, whether safe or risky, serves to fulfill their personal and social goals, such as achieving identity or autonomy. Risky behavior can be considered as a normal part of personality evolution. Up to 50% of adolescents have ever been involved in risky behavior, such as usage addictive substance or vandalism. This behavior will largely disappear after reaching adulthood. Risky behavior can include unhealthy eating habits (Nielsen Sobotková et al., 2014).

The question remains, how can the body be damaged in an increasingly sensitive period of evolution what the adolescence is. The US military studies indicated, that soldiers, who consumed energy drinks, had higher prevalence of suicide. Soldiers who combined energy drinks with alcohol had even much higher prevalence (Breda et al., 2014).

4 Conclusions

Consumption of energy drinks exponentially grows. This trend also increases the number of cardiac arrhythmias and collapses associated with the health risks. These hazards are associated with the consumption of energy drinks. Surprisingly the negative effects of energy drinks on the body are related to the frequency and amount of consumption. An important aspect is also the age of the consumer, when the marketing campaigns of energy drinks are mainly concentrated on younger age groups. However, it remains difficult to set the safe limit for energy drinks consumption.

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Life in Health 2018: Research and Practice

Proceedings of the International Conference
held on 6–7 September 2018

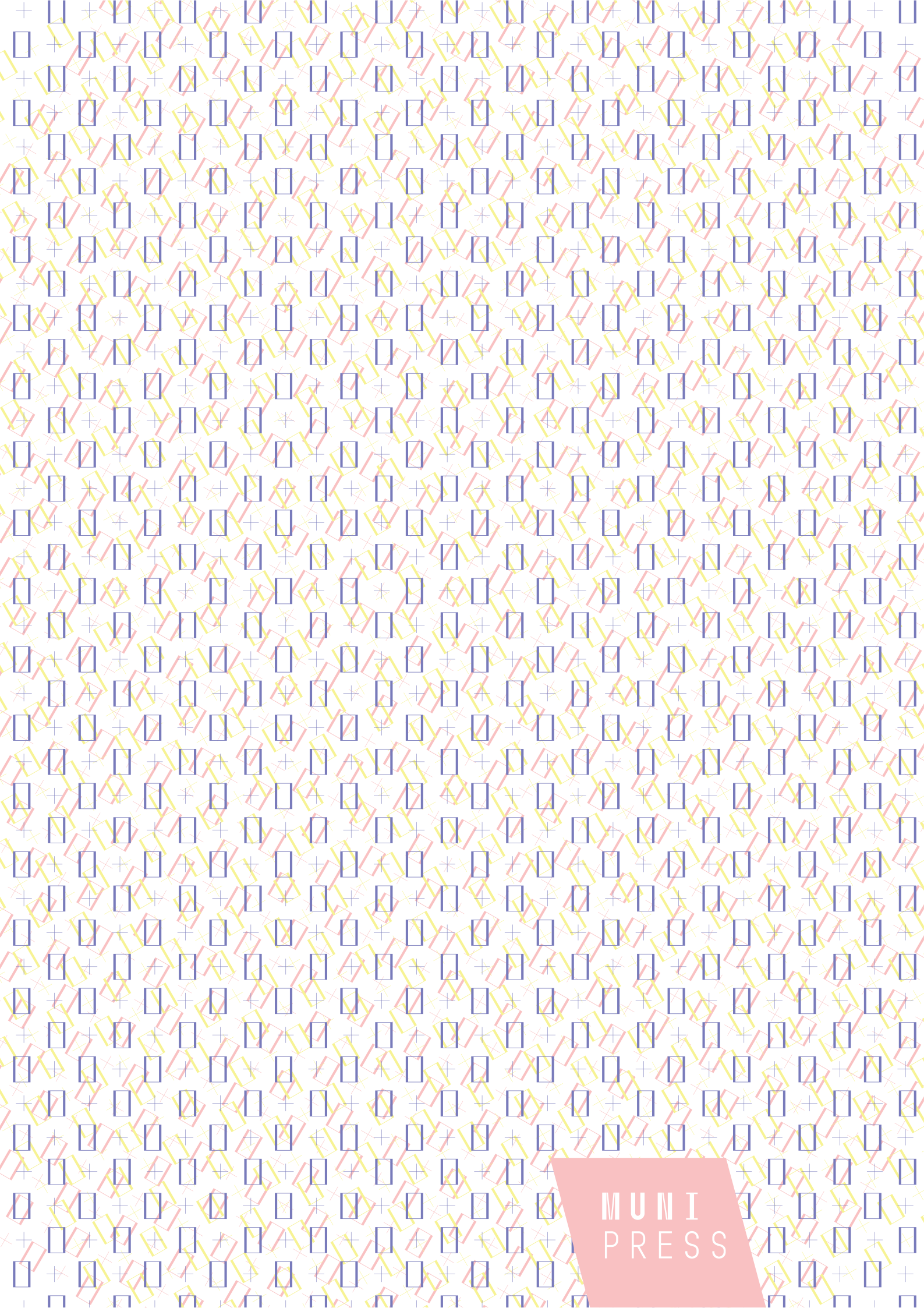
Markéta Krkošková, PhDr. Mgr. Lenka Procházková, Ph.D. (Eds.)

Published by Masaryk University, Žerotínovo nám. 617/9, 601 77 Brno

1st electronic edition, 2018

ISBN 978-80-210-9178-8

https://doi.org/10.5817/CZ.MUNI.P210-9178-2018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