

ASSESSMENT OF NUTRITIONAL HABITS AND PREFERENCES AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

Background. Appropriate nutrition is one of the most important factors affecting the proper development of man, nutritional status and maintaining good health. Adolescence is a period of development of skills of self-determination and self-realization, also in the case of nutrition. Children and school-age youth are the group most vulnerable to the effects of incorrect nutrition. The way of nutrition during this period determines psychophysical and emotional development, effectiveness in learning process and has influence on health in adulthood.

Objective. The aim of this study was to evaluate the habits and nutrition preferences in secondary school students from Rzeszów and Krosno age 16-19 years and to identify the differences between their eating behaviours.

Material and methods. The study involved 300 secondary school students from Rzeszów and Krosno. The research material was the Authors' questionnaire containing questions examining the eating habits of surveyed students. The statistical analysis was performed using the program StatSoft, Inc. STATISTICA version 12.0. To evaluate the differences between the two examined qualities there was used the Chi^2 test of independence. As the statistically significant level there was assumed the level of $p \leq 0.05$.

Results. In the surveyed group of high school students, more than half (59.66%) ate 4-5 meals a day. Snacking between meals declared 95% of high school students. Between meals the youth most frequently consumed fruits and vegetables (72.99%) and sweets (59.66%). Daily consumption of first breakfast before leaving the home declared more than half (62.33%) of the surveyed youth. Consuming products containing complete protein several times a week was declared by 49%. Whole wheat bread was daily consumed by 10.33% of the respondents, and grain products are daily consumed by 52.66% of the youth. 43.33% every day drank milk and milk products, while fruits and vegetables several times a day were consumed by 59.66% of the surveyed students. Consumption of products of "fast-food" type several times a month was declared by 49.66%, while irregular consumption of meals was declared by 20.33% of high school students. Physical activity was declared by 93.99%, and 3-5 times a week by only 21.66% of the surveyed students.

Conclusions. The conducted research shows that eating habits of most of the surveyed secondary school students both from Rzeszów and Krosno are satisfactory. The comparison of dietary habits among secondary school students showed no significant differences. Both groups committed similar errors: sweets snacking between meals, irregular meals and insufficient physical activity. A positive phenomenon was snacking of fruit and vegetables between meals and selection of mineral water and juices as the most frequently consumed beverages.

Key words: eating habits, nutrition, youth

STRESZCZENIE

Wprowadzenie. Prawidłowe żywienie jest jednym z najważniejszych czynników wpływających na właściwy rozwój człowieka, stan odżywienia i utrzymanie dobrego stanu zdrowia. Wiek młodzieńczy jest okresem rozwoju umiejętności samostanowienia i samorealizacji, również w przypadku żywienia. Dzieci i młodzież stanowią grupę najbardziej narażoną na skutki nieprawidłowego żywienia. Sposób żywienia w tym okresie determinuje rozwój psychofizyczny i emocjonalny, efektywność w procesie uczenia oraz wpływa na stan zdrowia w życiu dorosłym.

Cel. Celem badań była ocena zwyczajów i preferencji żywieniowych młodzieży licealnej z Rzeszowa i Krosna w wieku 16-19 lat oraz identyfikacja różnic pomiędzy ich zachowaniami żywieniowymi.

Materiał i metody. W badaniu wzięło udział 300 licealistów z Rzeszowa i Krosna. Materiał do badań stanowił autorski kwestionariusz ankiety zawierający pytania badające zachowania żywieniowe badanych uczniów. Analizę statystyczną wykonano z wykorzystaniem programu StatSoft, Inc. STATISTICA version 12.0. Do oceny różnic pomiędzy badanymi cechami wykorzystano test niezależności Chi^2 . Za istotny statystycznie przyjęto poziom $p \leq 0,05$.

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Wyniki. W badanej grupie uczniów ponad połowa (59.66%) spożywała 4-5 posiłków w ciągu dnia. Pojadanie między posiłkami deklarowało 95% licealistów. Między posiłkami młodzież najczęściej spożywała owoce i warzywa (72.99%) oraz słodczy (59.66%). Codzienne spożywanie pierwszego śniadania przed wyjściem z domu zadeklarowała ponad połowa (62.33%) badanej młodzieży. Spożywanie produktów zawierających pełnowartościowe białko, kilka razy w tygodniu deklarowało 49%. Pieczywo pełnoziarniste codziennie spożywało 10.33% badanych, zaś codziennie produkty zbożowe spożywa 52.66% młodzieży. 43.33% codziennie piło mleko i przetwory mleczne natomiast owoce i warzywa kilka razy dziennie jadło 59.66% badanych uczniów. Kilka razy w miesiącu spożywanie produktów typu „fast-food” deklarowało 49.66%, natomiast nieregularne spożywanie posiłków deklarowało 20.33% licealistów. Aktywność fizyczną deklarowało 93.99%, zaś 3-5 razy w tygodniu jedynie 21.66% badanych uczniów.

Wnioski. Z przeprowadzonych badań wynika, że zachowania żywieniowe większości badanych licealistów zarówno z Rzeszowa jak i Krosna są zadowalające. Porównanie nawyków żywieniowych wśród młodzieży licealnej nie wykazało istotnych różnic. Obydwie grupy popełniały podobne błędy: pojadanie słodczy między posiłkami, nieregularne spożywanie posiłków oraz niewystarczająca aktywność fizyczna. Pozytywnym zjawiskiem było pojadanie między posiłkami owoców i warzyw oraz wybieranie wody mineralnej i soków jako najczęściej spożywany napojów.

Słowa kluczowe: *zwyczaje żywieniowe, żywienie, młodzież*

INTRODUCTION

Children and adolescents are the most vulnerable for the impact of improper nutrition. The mode of nutrition is one of the factor influencing the proper development and growth of young organism and the maintenance of good health until advanced old age [16].

Adolescence is a time of turbulent change both in the body and for mental development. It is an important stage that shapes identity, value systems, attitudes and beliefs as well as health-related lifestyle behaviour such as eating habits and physical activity [14].

School-aged youth is a group characterised by intensive pace of living resulting from studying duties and extracurricular activities as well as particular susceptibility to media, which very often promote false or incomplete information concerning nutrition [20]. Skipping meals or their irregular consumption, low diversity of food products and dishes, low nutritional value diet (e.g. fast food products, sweets, sweetened drinks), but also insufficient intake of whole grain cereal products, fish, vegetables and fruit, are the most common in this particular group of people [3, 4, 22]. These disorders represent a growing social problem in recent years. There are many reasons for this including lifestyle change, low physical activity, stress or irregular eating habits. Until recently, majority of overweight or obese people were adults, while at present, this group is growing in young people and children. Worldwide, 66% of adults are overweight, and 34% are obese. In Europe, 50% of the population is overweight and 30% is obese [7, 13].

Young people often do not notice a direct connection between their behavior and health, so it's important transfer of knowledge and the development of attitudes and behaviors that may affect the lifestyle and the future of young people [14].

The aim of this study was to evaluate the habits and nutrition preferences in secondary school students from Rzeszów and Krosno age 16-19 years and to identify the differences between their eating behaviours.

MATERIAL AND METHODS

In the study there participated 300 students attending secondary school in Rzeszów and Krosno whose ages ranged between 16 to 19 years (mean 17.1 ± 0.75); 150 students coming from each city. Selected for the provincial city of Rzeszów and the smaller city belonging to the province of Podkarpackie, which is Krosno.

In the study group, women accounted for 65.7% ($n = 197$) and men 34.3% ($n = 103$). In the research conducted in June 2014 there were analysed the habits and nutrition preferences by the interview method using the Authors' questionnaire.

The questionnaire was divided into 2 parts. The first concerned summary statistic about gender, age, height and body mass. Nutrition habits were investigated in the second part, comprising of number of daily meals as well as the frequencies of consuming foodstuffs of adequate nutritional value, snacking in between meals, eating just before bedtime and how were fast-food fruit and vegetable consumed.

All statistical calculations were performed by the STATISTICA 12.0 software (StatSoft, Inc. USA). The Chi^2 test was used to assess the significance of differences between the categorical variables, adopting a critical value of $p \leq 0.05$ as demonstrating significance.

RESULTS

In the conducted research it was observed that in more than half of menus there predominated 4-5 meal model of nutrition, i.e. the secondary school students in Rzeszów (57.33%) and in Krosno (62%) (Figure 1). Consumption of three meals a day was declared by

25.33% of secondary school students from Rzeszów and by 24.66% from Krosno, while over five meals a day - 9.33% of secondary school students from Rzeszów and the same from Krosno. In the studied group, 8% of high school students from Rzeszów and 4% of secondary school students from Krosno consumed less than 3 meals daily.

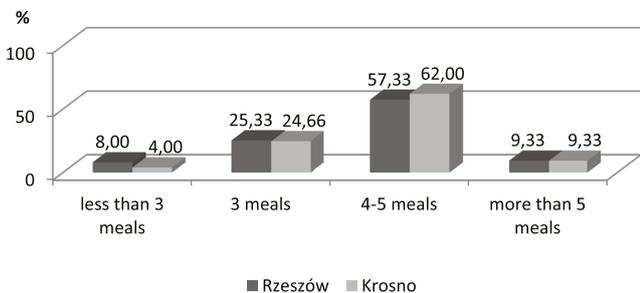


Figure 1. Number of meals consumed daily

The Authors' research showed that 62.33% of the examined youth (64.66% from Rzeszów and 60% from Krosno) declared daily consumption of first breakfast before leaving home. As much as 12.33% of the respondents, including 11.33% of the secondary school students in Rzeszów and 13.33% of the secondary school students in Krosno, did not have first breakfast at all (Figure 2).

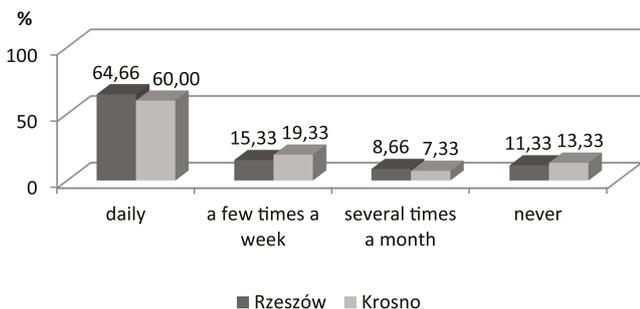


Figure 2. Consumption of the first breakfast before leaving home

76.66% of the respondents had their supper before going to sleep, with the percentage being lower for the secondary-school student in Krosno (74.66%) compared to the secondary-school students in Rzeszów (78.66%). Moreover, 23.33% of the respondents did not often eat before going to sleep. Such an answer was given by 21.33% of the secondary-school students in Rzeszów and 25.33% of the secondary-school students in Krosno (Figure 3).

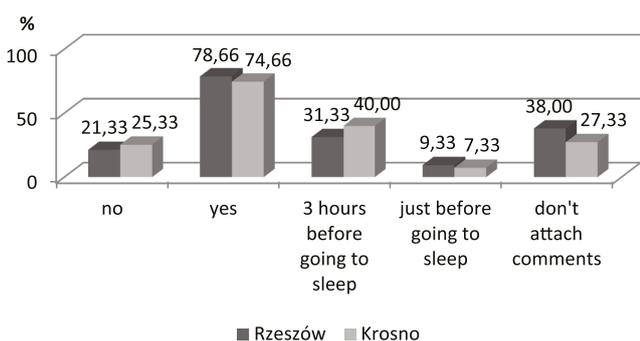


Figure 3. Eating before going to sleep

Consumption of meals at fixed times of the day was declared by only 20.33% of respondents (including 18% of high school students from Rzeszów and 22.66% of secondary school students from Krosno). In total, in both schools 19.33% of secondary school students said they never ate them regularly (Figure 4).



Figure 4. Eating regular meals

The Authors' research showed that almost all the surveyed respondents declared snacking between meals (96% of secondary school students from Rzeszów and 94% of secondary school students from Krosno). The most common products snacked by the surveyed at large were fruit and vegetables (72.99%), sweets (59.66%), beverages and dairy desserts (85.99%).

The research also identified the frequency of consumption of selected food products by secondary school students (Table 1).

The conducted studies have shown that eating wholesome products daily was declared by 40% of respondents from Rzeszów and 46.66% of respondents from Krosno, and several times a week (50% and 48% respectively). Lack of consumption of wholesome products was declared by only 0.66% of respondents in both groups ($p = 0.502$).

The analysis of the author's study results showed that milk and milk products were consumed by 40% of the respondents in Rzeszów and 46.66% of the respondents in Krosno every day. A few times a week milk and milk products were consumed by 40% and 45%, but several times a month by 16.66% of the respondents in Rzeszów and 6% of the respondents in Krosno ($p=0.016$).

Among the examined youth, consumption of fruit and vegetables 2-3 times a day was declared by 24.66% of secondary school students from Rzeszów and 28.66% from Krosno, once a day (56% and 63.33% respectively). Among the surveyed youth, consumption of fruit and vegetables several times a month was declared by 16.66% of high school students from Rzeszów and 6% from Krosno, while the lack of their consumption at all by only 2% in both groups ($p = 0.024$).

Table 1. Consumption frequency of selected food product groups by secondary school students in Rzeszow and Krosno

| Food product groups | Possible responses | Rzeszow | | Krosno | | p* |
|----------------------|-----------------------|---------|-------|--------|-------|-------|
| | | n=150 | % | n=150 | % | |
| Wholesome products | daily | 61 | 40.66 | 70 | 46.66 | 0.502 |
| | a few times a week | 75 | 50.00 | 72 | 48.00 | |
| | several times a month | 13 | 8.66 | 7 | 4.6 | |
| | not at all | 1 | 0.66 | 1 | 0.66 | |
| Grain products | daily | 82 | 54.66 | 76 | 50.66 | 0.294 |
| | a few times a week | 52 | 34.66 | 60 | 40.00 | |
| | several times a month | 14 | 9.33 | 13 | 8.66 | |
| | not at all | 2 | 1.33 | 1 | 0.66 | |
| Dairy products | daily | 60 | 40.00 | 70 | 46.66 | 0.016 |
| | a few times a week | 60 | 40.00 | 69 | 46.00 | |
| | several times a month | 25 | 16.66 | 9 | 6.00 | |
| | not at all | 5 | 3.33 | 2 | 1.33 | |
| Fruit and vegetables | 1 time a day | 37 | 24.66 | 43 | 28.66 | 0.024 |
| | 2-3 times a day | 84 | 56.00 | 95 | 63.33 | |
| | a day | 26 | 17.33 | 9 | 6.00 | |
| | several times a month | 3 | 2.00 | 3 | 2.00 | |
| | not at all | | | | | |
| Whole wheat bread | daily | 21 | 14.00 | 10 | 6.66 | 0.288 |
| | a few times a week | 31 | 20.66 | 34 | 22.68 | |
| | several times a month | 53 | 35.33 | 58 | 38.66 | |
| | not at all | 43 | 28.66 | 48 | 32.00 | |
| Fast-food products | 1 time a day | 3 | 2.00 | 0 | 0.00 | 0.001 |
| | 1 time a week | 13 | 8.66 | 7 | 4.66 | |
| | a few times a week | 11 | 7.33 | 3 | 2.00 | |
| | several times a month | 81 | 54.00 | 68 | 45.33 | |
| | not at all | 42 | 28.00 | 72 | 48.00 | |

**Chi*² test

In the conducted research it was observed that grain products are daily consumed by 52.66% of young people (including 54.66% from Rzeszów and 50.66% from Krosno), and several times a week (respectively 34.66% and 40%) ($p = 0.294$).

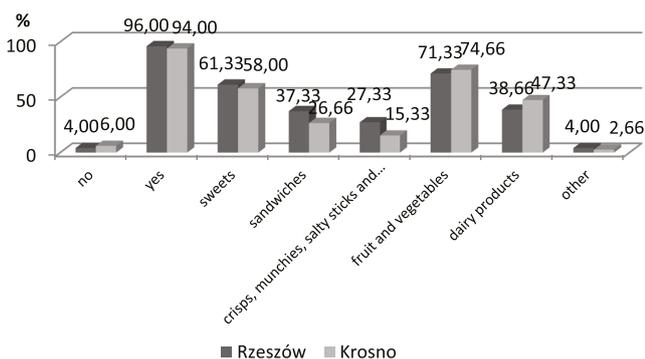


Figure 5. Snacking between meals

The Authors' research showed that 21.67% of the surveyed youth (20.66% from Rzeszów and 22.68% from Krosno) declared consumption of wholemeal bread every day in 1 meal, several times a week (35.33% and 38.66% respectively), while a few times a month (28.66% and 32%) ($p = 0.288$).

Among the surveyed students, the consumption of fast-food products several times a week was declared by 7.33% of secondary school students from Rzeszów and 2% from Krosno, once a week (8.66% and 4.66% respectively), while a few times a month (54% and 45.33%). Lack of consumption of this type of food was declared by 28% of secondary school students from Rzeszów and 48% from Krosno ($p=0.001$).

The most popular beverages consumed among of both groups in the Authors' research were mineral water (80% from Rzeszów and 78.66% from Krosno), fruit juices (65.33% and 68% respectively) and soft fizzy drinks (24% and 31.33%), while less popular proved drinks of such a type as redbull, tiger (4.66% and 6%) (Figure 6).

The results of the Author's research showed that 93.66% of respondents declared taking physical activity. Regular physical activity 3-5 times a week was declared by 20.66% of secondary school students from Rzeszów and 22.66% from Krosno respectively. Daily physical activity was declared by 34.66% from Rzeszów, while 26% of respondents from Rzeszów and 39.33% from Krosno run active type of life 1-2 times a week. Lack of physical activity was declared by 2.66% of secondary school students from Rzeszów and 9.33% from Krosno (Figure 7).

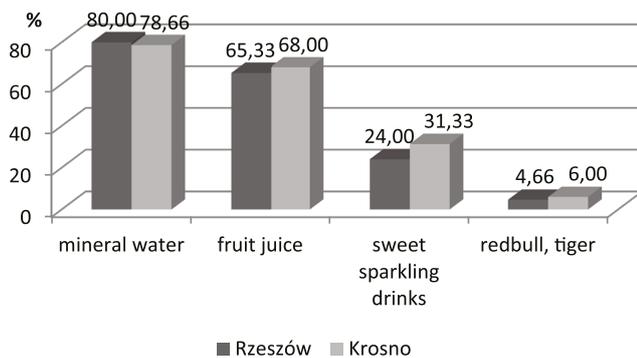


Figure 6. Types of drinks you consume

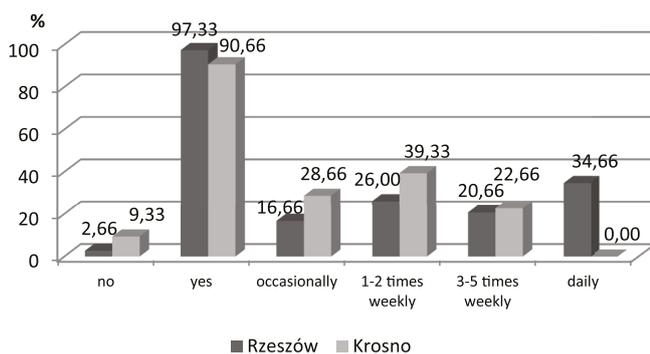


Figure 7. Keeping active lifestyle

DISCUSSION

One of the main criteria for eating behaviours assessment is the number of meals eaten daily. According to the principles of well-balanced nutrition worked out by the National Food and Nutrition Institute (Warsaw, Poland) in 2009, children and youth should consume 4-5, but optimally 5 meals a day [15]. The results of the study showed that in more than half of menus there predominated 4-5 meal model of nutrition, i.e. the secondary school students in Rzeszów (57.33%) and secondary school students in Krosno (62%). Similar results were obtained by *Szymańska-Pomorska* et al. [21], who showed that the majority of the students who participated in their studies declared having 4 meals a day (39.4% of the respondents) and 22.5% of the students had 5 meals a day. A study by *Gajda* and *Jeżewska-Zychowicz* [6], who showed that the majority of the pupils who participated in their studies ate 4-5 meals a day (54.5%). Similar data was presented by *Orkusz* and *Babiarz* [11], who assessed of selected dietary habits of secondary school students from Jawor. According to the authors the secondary school students most frequently had 4 meals a day (65.5%).

The first breakfast is considered the most important meal of the day. It supports harmonious intellectual and physical development of children and adolescents. It provides the body with needed energy and

nutrients, has influence, among other things, on better concentration, memorizing and learning ability, and as a result, on better performance in learning and work [9]. The analysis of the author's study results showed that 12.33% of the respondents, including 11.33% of the secondary school students in Rzeszów and 13.33% of the secondary school students in Krosno, did not have first breakfast at all. Similarly results were obtained by *Szczepańska* et al. [20], while evaluating the eating behaviours of secondary school pupils from the upper Silesian region in Poland. Their study showed that 14.1% of the respondents did not have breakfast at all. However, *Orkusz* and *Babiarz* [11], who assessed of selected dietary habits of secondary school students, showed that only 39.9% respondents consumed the first breakfast at home every day.

One of the basic principles of rational nutrition is regular consumption of meals with adequate nutritional value. It is especially important during adolescence because it allows developing proper eating habits in adulthood [9]. Lack of regular meals is conducive to snacking between them. The author's research showed that almost all the surveyed respondents declared snacking between meals (96% of secondary school students from Rzeszów and 94% of secondary school students from Krosno). Similar results were obtained by *Sitko* et al. [16], who showed that almost all the students who participated in their studies declared snacking between meals (99.8% secondary school students). According to many authors [1, 2, 17] snacking between meals is one of the most frequently observed inappropriate nutritional habits among young people.

Meat, poultry, cured meat products, fish, eggs and legumes are a source of complete protein and heme iron and therefore should be present in at least one meal a day. The author's study showed that eating wholesome products daily was declared by 40% of respondents from Rzeszów and 46.66% of respondents from Krosno.

Milk and milk products should be a regular element of one's everyday diet. Not only are they the main source of calcium, but also deliver protein of high biological value, vitamins from groups B, A and D as well as minerals such as magnesium, potassium and zinc [15]. The analysis of the author's study results showed that milk and milk products were consumed by 40% of the respondents in Rzeszów and 46.66% of the respondents in Krosno every day. *Mensink* et al. [10], who assessed the consumption frequency of particular products in a group of German youth aged 11-17, showed that only half of the respondents consumed milk every day. Similarly low milk and milk products consumption was observed by *Ortiz-Hernandez* and *Gomez-Tello* [12].

According to the pyramid of healthy eating, fruit and vegetables as well as milk and dairy products should be eaten by every consumer several times a day. The analysis of the study results showed that consumption of fruit and vegetables 2-3 times a day was declared by 24.66% of secondary school students from Rzeszów and 28.66% from Krosno. Similar results were obtained by *Szczepańska* et al. In their study eating fruit a few times a day declared 31.6% of the secondary-school pupils and eating vegetable declared 28,3% of respondents [20]. In the research of *Gacek* et. al. [5] more than half of respondents take into account the consumption of fruit and vegetables a few times a day, at the same time the majority of that consumption concerned girls.

According to the principles of well-balanced nutrition, the source of energy in children and youth's diet should be grain products, including most of all whole meal bread, which ought to be consumed several times a day [15]. The author's study showed that grain products are daily consumed by 52.66% of young people (including 54.66% from Rzeszów and 50.66% from Krosno). The research carried out by *Szymańska-Pomorska* et al. [21] shows that the respondents eagerly have grain products in their diet - they are present every day in meals of 57.6% of girls and 64.3% of boys.

The author's study showed that the consumption of fast-food products several times a week was declared by 7.33% of secondary school students from Rzeszów and 2% from Krosno. In the research conducted by *Wierzbicka* and *Stasio* [23] on consumption of fast-food products there were obtained different results - consumption 1-2 times a week of food of this type was declared, depending on the place of residence, from 40 to more than 80% of young people.

The analysis of the study results showed that the most popular beverages consumed among high school students of both groups were mineral water (80% of high school students from Rzeszów and 78.66% of high school students from Krosno), fruit juices (65.33% and 68% respectively) and soft fizzy drinks (24% and 31.33%). Similar results were obtained by *Sitko* et al. [16] where the most frequently consumed beverages by high school students were non-carbonated mineral water (64%), fruit juices (56%) and tea. The HBSC report provides relevant data which indicates that 27.3% of Polish pupils, age 15-16 years declared drinking sugary drinks [8].

Physical activity and spending free time combined with healthy eating is one of the basic elements of a healthy lifestyle. It stimulates the physical, motor, psychosocial development of children and adolescents. In today's world an extremely rapid pace of life is accompanied by elimination of physical exercise and a reduction in physical activity [14].

If physical activity is to bring benefits, it must be done regularly every day for an hour, and the bare minimum of moderate or high physical activity is 30 minutes a day [9, 18]. The results of the author's research showed that regular physical activity 3-5 times a week was declared by 20.66% studied students from Rzeszów and 22.66% from Krosno.

CONCLUSIONS

1. Secondary school students from Rzeszów and Krosno usually eat 4-5 meals a day, in addition 66.33% declared eating breakfast before leaving home.
2. More than half of youth declared that they daily consume wholesome products, and 20.66% declared consumption of wholemeal bread. Moreover, most of respondents snack.
3. The majority of studied students take physical activity, but daily physical activity is taken up by only 34.66% studied students from Rzeszów.
4. The eating habits of high school students from Rzeszów and Krosno show no significant differences. Both groups committed similar nutritional errors, and a positive phenomenon was the selection of mineral water and juices as the most frequently consumed beverages.

Conflict of interest

The authors declare no conflict of interest.

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