

FREQUENCY OF MEAL CONSUMPTION IN ADOLESCENTS IN SELECTED EUROPEAN COUNTRIES

FREKvence STRAVOVÁNÍ U ADOLESCENTŮ VE VYBRANÝCH STÁTECH EVROPY

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Summary

This article deals with the specific features of eating meals by adolescents in four Central European countries (the Czech Republic, Slovakia, Poland and Hungary) and Croatia. The study is particularly focused on meal frequency per day and/or per week. The data were drawn from existing studies describing research conducted in adolescents. No important differences were identified across the countries. Irregular food intake and missing breakfasts represent the essential shortcomings of adolescents 'eating habits.

Keywords: meal frequency, adolescents, nutritional condition

Introduction

Adolescence can be regarded as one of the most demanding and important stages in which essential values of human lives are created. In the biological and social area, it is marked by several qualitative and quantitative changes that include achieving sexual maturity, reproduction ability, acquiring new roles and changes in thinking and reasoning (Vágnerová,

2000). In this period, opinions and attitudes are formed, including the lifestyle which involves eating habits and the own body image. Other authors confirmed it (Matos et al., 2012), who mention the supporting character of intervention programs in this area.

Unsuitable eating habits, high intake of junk food and energetically nutritious food, accompanied with a low intake of fruit and vegetables, represent characteristic eating habits of adolescents. These negative phenomena may have an impact on the physiological and psychological health, including the indicators of obesity (Pearson et al., 2017). The essential elements of the prevention of chronic diseases and health promotion include regular meals, non-omission of breakfast and a sufficient intake of fruit and vegetables (Bazzano et al., 2003; Vartanian et al., 2007). In addition, some studies confirm the fact that eating habits created in adolescence are transferred to the adult age (Emmett, Jones, 2015; Nigg, Amato, 2015; Northstone et al., 2013). A similar phenomenon can be observed in association with the increase of body weight where poor nutritional habits in adolescence correlate with the development of obesity in adult age (Merten et al., 2009; Moore et al., 2006). Overweight and obesity at school age are predictors of the development of a metabolic syndrome during adolescence (Majer, 2015; Mameli et al., 2017).

Thus, obesity becomes an increasingly important problem of public health due to the obvious increase of its frequency, which directly or indirectly influences the sickness rate, the life expectancy and mortality rate of the population.

Our paper describes the specific features of nutritional habits in four central European countries (the Czech Republic, the Slovak Republic, Poland, and Hungary) and in Croatia. It is particularly focused on the frequency of eating individual meals during the day. The data were drawn from existing studies describing the research focused on adolescents.

Meal frequency

The optimal distribution of meals during a day from the point of view of the one-day uptake of energy should be as follows: breakfast should cover 20%, morning snack 15%, midday meal 30%, afternoon snack 15% and supper 20% of the total energy (Wang, 2014). The food pyramid is regarded to be the basic diagram describing the composition of the menu at school age. The size of portions is lower at the younger school age and later it is increased in the proportion to the size of adult portions. In children and adolescents, the first meal of the day, which is breakfast, should be emphasized. The regular consumption of breakfast is associated with a higher intake of trace elements and a lower intake of fats (Rampersaud et al., 2005). In adolescents, regular consumption of breakfast is also associated with a generally better

cognitive performance and better psychological and social functions (Matthys et al., 2007). Moreover, research has confirmed a decreased risk of overweight and obesity in children consuming breakfast regularly.

More studies mention in this connection that a substantial part of school children and adolescents do not have breakfast. The studies draw attention to the fact that the individuals who regularly have breakfast and can divide the all-day intake of energy into five portions are at a clearly lower risk of sugar level fluctuation and, at the same time, manage to keep constant weight (Klimešová et al., 2013). Similar conclusions were attained by Wojtyła-Buciora et al. (2013), who also mention the importance of regular consumption of meals during the day. Between two individual meals, there should not be a gap longer than 3-4 hours, which has finally a positive influence on the carbohydrate metabolism and the maintenance of constant levels of blood glucose and lipids.

Breakfast consumption represents a significant indicator of a healthy lifestyle (Hallström et al., 2011). The technology of making individual meals, which influences the nutritional value of meals in an essential way, plays an important role. When storing food for a long time and using improper technologies of preparation, valuable nutritional substances may be lost. This phenomenon can be observed during the preparation of many portions, e.g. in school canteens (Gebhardt, Thomas 2002).

Regular eating habits should be one of basic principles of a healthy lifestyle that is subsequently transferred into the rhythm of other daily activities. Currently, this rhythm of eating meals is often neglected. Meals are eaten fitfully, mainly in the evening, which has often a negative influence on the functioning of metabolism (Skafida, 2013).

Regular meals and regimen of eating meals are particularly important for a maturing organism mainly because adolescence may increase the number of risk factors and a right nutrition can improve them to some degree (Böröndi-Fülöp et al., 2011).

In Slovakia, a study describing eating habits of adolescents in the last form of secondary school (i.e. at the age of 18-20 years, n=110 respondents) draws attention to irregular regimen of eating meals. Only 22% respondents have breakfast, 52% have their midday meals and 38% respondents eat supper. These findings are in accordance with the results of a national project focused on the eating habits of Slovak children and adolescents (n=4,205). This study also shows that breakfast consumption is insufficient in the age category of 15 to 18. Only 47.6% of the respondents have breakfast regularly, 32.3% irregularly and 19% adolescents do not eat breakfast at all. The analysis of midday meals eaten on weekdays shows that 80.7% adolescents have midday meals regularly; however, every fifth respondent (i.e. 18.3%) takes

midday meals irregularly. The regular consumption of midday meals was significantly higher in boys in comparison with girls ($p < 0.001$). Regular and irregular consumption of suppers was mentioned by 75.1% and 20% of the respondents, respectively. Almost 3% adolescents do not have any supper at all. Regular consumption of suppers is higher in boys than in girls. Higher differences were identified in the consumption of morning and afternoon snacks. 72.7% adolescents regularly consume morning snacks; however, afternoon snacks are eaten only by 27.7% of the respondents. 23% and 52.6% of the respondents eat irregularly morning snacks and afternoon snacks (Béřešová et al., 2014).

Croatian authors are also presenting similar findings (Kljusuric et al., 2016; Milosavljevic et al., 2015 a 2011; Barić, Štalić, 2002). Milosavljevic et al. (2011 and 2015) confirmed the irregularity of eating meals during the day and frequent omission of breakfasts by adolescents. In the age group of 17 to 19, a drastically low consumption of breakfast was even mentioned. Barić and Štalić (2002) found that from 1,190 respondents at the age of 7 to 18 years in 26% breakfast covered their total daily energy intake. In breakfast, the saccharide component was represented more than the lipid component. By Paklarčić (2015), the largest parts of respondents consist of adolescents who consume three main meals (66.5%) and those who do not have breakfast (41.2%). Đuranec (2015) suggests that preadolescent children with a normal weight often consume meals after 8 p.m. Tomić et al. (2013) describe that as many as 48.7 % adolescents consume fast food as their midday meal several times a month, while the most common dish is pizza (79.7%).

Polish studies also mention omission of breakfast, which plays an important role in the development of adolescents' obesity. In the association with the meal frequency, Jodkowska et al. (2014) mention that in a sample of 574 13-year-old overweight teenagers, only 44% took breakfast, which is significantly less than in teenagers with a normal weight (69%). More positive results were obtained by Wojtyła-Buciora et al. (2013), who found out regular consumption of breakfast and supper in approximately 70% of respondents of a randomized group of adolescents at the age of 16 to 19 years. Snacks eaten during the day were consumed by 77% of respondents.

Several other Polish authors (Woźniak et al., 2014; Szczepanska et al., 2013; Przyslawski et al., 2011) studied the adolescents' meal frequency during the day. In the study by Woźniak et al. (2014) consisting of 170 grammar school pupils from Warsaw, only 29% of the respondents took 5 meals a day; this relates to more girls than boys (35% vs. 20%). The boys tended to have supper more frequently than girls. Przyslawski et al. (2011) even found in his study that 7% of respondents took only two meals a day, while $\frac{1}{4}$ of the respondents did not

have breakfast at all. In this sample, 67% of respondents consumed snacks several times a week, while the consumption of sweets was very high – even several times a day, in one quarter of the studied girls.

Ostachowska-Gasior et al. (2016) mention poor eating habits of Polish children at the age of 9 to 13 living in the country. They often omit breakfast, eat sweets in excessive quantities and consume low amounts of fruit and vegetables.

Other authors call attention to the fact that missing breakfasts is closely associated with a generally higher energy intake during the day. Breakfast is the primary source of energy after all-night fasting. The regular breakfast consumption is associated with a higher capability of concentration and with a better performance at school (Moore et al., 2007; Voráčová et al., 2015).

Moreover, a higher regularity in eating breakfast results in a higher regularity in eating other meals during the day. Regardless the sex, midday meals were the most frequently consumed meals. Girls omit more frequently than boys some of the main meals of the day (Ostachowska-Gasior et al., 2016). Matthys et al. (2007) point out the fact that at the age of 11 to 15 years, approximately 30% adolescents do not have breakfast on schooldays and 20-30% adolescents do not consume any meals during their stay at school.

Eating habits are determined by several factors. While studying the relationship between the eating habits and the body image in Polish adolescents and young adults, it turned out that more than 87% pupils and students mentioned the consumption of snacks instead of main meals. Moreover, one third of them state that they consume food at night time. 44.4% of pupils and 46.7% of students regularly overeat several times a week. The BMI calculations have proven more overweight in students in comparison with pupils. Almost 10% of the respondents mentioned their fear of putting on weight, inclusive those whose weight was normal. Approximately $\frac{3}{4}$ of obese individuals had tried to decrease their body weight in the past (Kapka-Skrzypczak, 2012).

A remarkable study was focused on the exploration of nutritional behaviour of secondary school students living in the border area of Poland and the Czech Republic (Szcepanowska et al., 2013). The sample consisted of 202 from both countries. The authors found out that 47% of respondents took meals 4-5 times a day. 45% and 50% have regular breakfasts and midday meals, respectively. The differences between the Polish and Czech adolescents were recorded mainly in the consumption of breakfasts and midday meals. Czech pupils have more than 4 meals a day and more frequently have breakfast before leaving home in comparison with Polish adolescents. Czech pupils have their midday meals at school more frequently.

Another Czech study comprising 123 adolescents at the age between 15 and 20 years mentions a very low number of individuals eating meals regularly – their findings show that only 7.3% of adolescents have 5 meals a day (Dolénková, Hlúbík, 2013). A positive result is obtained by a HBSC study, which mentions positive changes in the breakfast consumption frequency by Czech adolescents, where the breakfast consumption significantly increased between 2002 and 2014. Furthermore, it was found out that girls consumed breakfasts at weekends significantly more frequently than boys (Voráčová et al., 2015). Kimmer et al. (2016) were considering the consumption of individual meals in a sample of 1,130 adolescents at the age group between 15 and 18 years. Regular breakfast consumption 7x 39.5% adolescents mention a week; on the other hand, 11% do not have breakfast at all. More positive results can be seen for midday meals and suppers, where regular consumption 7 times a week is mentioned by 68% and 63.6% adolescents, respectively.

Hungarian secondary school students do not have a regular daily regimen either. According with Péter et al. (2008) study, 25.2% do not have breakfasts, 7.5% do not have midday meals, and 9.5% do not have suppers. Other Hungarian authors (Kiss, Szakály, 2015) informed in their study of adolescents that most of the studied subjects consumed four meals a day (30.6%). In this sample, cooked food was consumed regularly on everyday basis by 67% of respondents. Moreover, another 19% of individuals consumed cooked meals several times a day. The findings of Huszka, Dernóczy-Polyák (2015) are identical. Böröndi-Fülöp, Szakály (2007) state that in their studied sample of adolescents, on one hand, 57% have breakfasts every day and, on the other hand, 9.5% do not have breakfast at all. On average, 37% adolescents eat four meals a day while only 51.3% have a hot meal once a day. Adolescents with overweight often omit meals during the day. Under the HBSC study, 29.2% Hungarian adolescents never have breakfast on weekdays. 48.5% adolescents have breakfast every weekday (Németh, Költi, 2011).

The trends of daily consumption of breakfast by teenagers and adolescents from 31 participating countries were repeatedly explored by HBSC international studies. Respondents living in complete families consumed breakfast more frequently in comparison with those living with just one parent. In countries like Germany, Croatia, Spain or Poland, significant decrease of daily breakfast consumption has been noticed since 2002 (Lazzeri et al., 2016).

Conclusion

The paper presents results of existing studies focused on the frequency of consumption of individual day meals in adolescent population from 5 selected countries. The regular intake of nutrients in adolescence plays an important role in the prevention of many hazard factors. Irregular consumption of meals and frequent omission of breakfasts represent an essential shortcoming. All studies draw attention to a high percentage of adolescents – both boys and girls – who miss the first meal of the day, i.e. breakfast. This results in increased intake of energy in the afternoon or in the evening, irregular intake of energy during the day and, possible increase of body weight. These findings suggest the necessity of adequate education of both adolescents and their parents in healthy nutrition.

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