

# Eating Habits of Children Aged 10-15 Years in Reference to Nutrition Status

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**Abstract**—Eating behaviours of people are determined by knowledge gained at different stages of life. Children's diet is especially important. They have to eat meals regularly. Meals should consist of protein, carbohydrates and fat, and drinking the right amount of water. Mistakes in children's diets affect their health and may lead to health issues such as diabetes, overweight, obesity or malnutrition. The aim of the study was to assess the eating habits among 10-15-year-old children. To achieve this aim, the study included children aged 10-15 years living in Silesia Province, Poland; the participants consisted of 52.08% girls and 47.92% boys. Authorial questionnaire contains 28 questions about eating habits. The results of 192 students were subjected to analysis. The results show that half of the surveyed students participated in physical activity every day. Most children ate 4-5 meals every day, but the breaks between them were too long (four and more hours). Children generally ate cooked meals. Most children ate first breakfast every day, but only one third of studied children ate a second breakfast daily, while 93.75% ate vegetables at least once a day, 94.79% ate fruit at least once a day, and 79.17% drink a daily glass of milk or more. The study found that the eating behaviours of the surveyed children were unsatisfying. While the children did not participate in physical activity often enough, girls took part slightly more often. Children eat second breakfast not often enough. Younger children (10-12 years old) are doing it more often than the older children (13-15 years old). Gender is not a determinant of the frequency of second breakfast consumption.

**Keywords**—Eating habits, children, diet, nutrition status.

## I. INTRODUCTION

**N**UTRITION is one of the most important factors affecting the overall health and functioning of the body. It is particularly important in the case of children. For proper physical and mental development, it is necessary to provide all nutrients in accordance with the current demand. Deficiencies may affect the health and functioning of the body in adulthood and result in the formation of bad eating habits [1]. Everyday nutrition involves numerous choices about food. Activities that are aimed at satisfying the nutritional needs of a person are called nutritional behaviours. They include the eating habits, that is, the characteristic behaviour which stems from the need to provide nutrients and is preserved as a result of repetition [2].

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## A. Acquiring Eating Habits

Development of eating habits, both good and bad ones, is influenced by numerous factors. However, family conditions are the most important ones. Children learn the principles of nutrition by observing the activities their parents undertake to satisfy their nutritional needs. Thus, their knowledge of the principles of proper nutrition can significantly reduce the risk of threats resulting from eating mistakes such as overweight, obesity, and malnutrition. It can also reduce the incidence of diseases such as diabetes and eating disorders such as anorexia nervosa or bulimia nervosa. Even basic knowledge about the principles of proper nutrition allows individualizing the child's diet in order to adapt it to its current needs [3]. School education also plays an important role in shaping eating habits. Despite many efforts, the knowledge of both children and their parents is still insufficient. The reluctance in parents to change their habits, and irregularities in running their own nutrition, translate directly into eating mistakes by children [4].

Incorrect eating habits can also be acquired as a result of not satisfying or incorrectly meeting certain needs. Researchers distinguish between biological and psychosocial needs, as well as the need for social interaction. Lack of implementation of any of the above needs can be replaced with food, which inevitably leads to the formation of incorrect eating habits [3]. According to scientific reports, television plays a significant role in shaping eating habits as well as habits related to physical activity of children. Easy access to entertainment on television deprives children of the time they could devote to physical activity and other activities which positively influence health and development. In addition, the presentation of advertising for food products, especially sweets or fast-food products has a negative impact on children's eating habits [5]. According to the study of Bryła et al., children who watch TV for 5.5 hours a day present a 4 to 6 times greater risk of overweight because an average of 10 to 12 advertising spots only for children and often promoting the consumption of fast foods or products containing large amounts of sugar appears on the screen within one hour (the research was carried out in the USA, Great Britain and Australia) [5].

## B. Healthy Eating Habits of Children - General Recommendations

Each body requires a regular supply of all nutrients and energy. Therefore, the food ration should include the consumption of five meals during the day, i.e. breakfast, the second breakfast (lunch), dinner, afternoon tea (dessert) and

supper. It is recommended that each of them carries an appropriate charge of energy. The first breakfast should constitute 25% to 30% of the energy value of the daily food ration, the second breakfast – 5% to 10%, dinner – 30% to 35%, afternoon tea – 5% to 10% and supper – 20% to 25%. It is not recommended that the breaks between them exceed more than 3 or 4 hours. This enables the body to rationally manage energy and nutrients without having to store supplies for periods of hunger [6], [7]. Children who feel hungry between the main meals should have a healthy snack. However, one ought not to forget that eating snacks just before the main meal may result in problems with the consumption of a proper, nutritious meal. It is recommended that the intervals between snacks and main meals should be at least two hours [8].

When selecting snacks, one should avoid sweet products, such as cookies, candies, candy bars, and salted products such as salty nuts, breadsticks, crisps, as well as fatty, fried products, for example chips. It is recommended to reach for snacks such as fruit or dried fruit and raw vegetables, for example carrots, cucumbers, peppers, which are rich in vitamins and fibre. In addition, snacks can be enriched with yoghurt or beverages from fermented milk, nuts or seeds such as pumpkin or sunflower seeds (in limited quantities, due to their high calorie content) [8]. When preparing main meals, special attention should be paid to choosing the right culinary technique. The healthiest meals are steamed, because this way of preparation allows to reduce the loss of nutrients. Healthy food processing techniques also include cooking and stewing, especially without pre-frying. Meals that should be reduced are fried ones, especially in deep fat, because such preparation causes a significant increase in the calorific value of the prepared dishes [9].

## II. OBJECTIVES

Proper nutrition of children aged 10-15 years is crucial for their further development. However, according to scientific research, errors in children's diet do occur [1]. Therefore, the main goal of the research was to assess the eating habits in a group of school children aged 10-15 years living in the Silesian Province, Poland.

The detailed objectives of the work were:

- Evaluation of the frequency of children's physical activity depending on gender.
- Evaluation of the frequency of children's first breakfasts depending on their age.
- Study of the impact of gender on the frequency of eating the second breakfast by children.

## III. MATERIAL AND METHODS

The study was conducted in November 2017 among children aged 10-15 years, with 192 people from the province of Silesia taking part in the research. Over half of the respondents were girls (52.08%, N = 100), while 47.92% were boys (N = 92). Most of the children completing the survey lived in the countryside (97.92%, N = 188), and only 2.08% in

the city (N = 4). Over 80% (N = 152) of the respondents were aged 10-12 years, while the remaining 19.79% (N = 38) were 13-15 years. Incorrectly completed surveys have been rejected. The study was conducted with the questionnaire including 28 questions on eating habits, the most frequently consumed products and the frequency of their consumption. The questionnaire contained only closed questions requiring the selection of one answer. The survey contained questions about the gender of children, their age (divided into age groups based on those used to set the food and nutrition standards of the National Food and Nutrition Institute (IŻŻ)) and the place of residence (village, town). The analysis of the results was carried out using the MS EXCEL program.

## IV. RESULTS

Girls constituted 52.08% (N = 100) of the studied group, while 47.92% were boys (N = 92). Nearly all of the respondents (97.92%, N = 188) lived in the countryside, with 2.08% (N = 4) residing in the city. Over 80% of the respondents were children aged 10-12 years (N = 154), while 19.79% (N = 38) were aged 13-15 years.

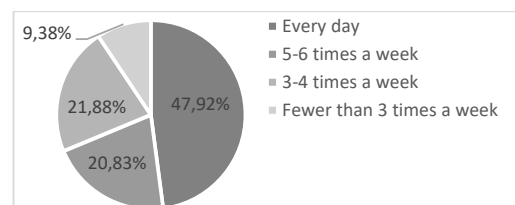


Fig. 1 Frequency of physical activity among respondents

Of the children surveyed, 47.92% (N = 92) declared that they participate in physical activity on a daily basis, while 9.38% (N = 18) of respondents indicated taking part less than three times a week.

TABLE I  
CHARACTERISTICS OF THE STUDY GROUP DUE TO THE FREQUENCY OF  
PHYSICAL ACTIVITY DEPENDING ON THE SEX

	Girls	Boys
Every day	54,00%	41,30%
5-6 times a week	26,00%	15,22%
3-4 times a week	12,00%	32,61%
Fewer than 3 times a week	8,00%	10,87%

According to Table I, everyday physical activity is more often taken by girls (54.00%, N = 54) than boys (41.30%, N = 38). Girls more often than boys (15.22%, N = 14) declare participating in physical activity 5-6 times a week (26.00%, N = 26).

Over half (56.25%, N = 108) of respondents declared consumption of the correct number of meals during the day (4-5 meals), while 31.25% (N = 60) indicated that they consume three or fewer meals during the day.

In terms of meal frequency, 42.71% of respondents declared that they eat meals every 2 hours, while 48.96% (N = 94) indicated that the breaks between meals consumed are four or

more hours long.

The result also showed that 82.29% (N = 158) of the respondents eat the first breakfast every day, while 8.33% (N = 16) declared that they were eating their first breakfast less than three times a week.

TABLE II  
CHARACTERISTICS OF THE STUDY GROUP DUE TO THE FREQUENCY OF THE FIRST BREAKFAST DEPENDING ON THE AGE (N = 192)

	10-12 years of age	13-15 years of age
Every day	88.31%	57.89%
5-6 times a week	2.60%	15.79%
3-4 times a week	2.60%	10.53%
Fewer than 3 times a week	6.49%	15.79%

Children aged 10-12 years consume the first breakfast definitely more often (88.31%, N = 136) than children aged 13-15 years (57.89%, N = 22), and 32.29% (N = 62) of all respondents declared eating a second breakfast every day. Equally numerous was the group of respondents who indicated that they eat a second breakfast less than three times a week (32.29%, N = 62).

TABLE III  
CHARACTERISTICS OF THE STUDY GROUP BASED ON THE FREQUENCY OF CONSUMPTION OF THE SECOND BREAKFAST DEPENDING ON THE GENDER (N = 192)

	Girls	Boys
Every day	32.00%	32.16%
5-6 times a week	24.00%	21.74%
3-4 times a week	12.00%	13.04%
Fewer than 3 times a week	32.00%	32.16%

The above data shows that boys have the second breakfast as often as girls (boys: 32.00%, N = 30 - daily, 24.00%, N = 20 - 5-6 times a week; girls: 32.16%, N = 32, 21.74%, N = 24, respectively).

## V. DISCUSSION

According to the author's own research, 47.92% of children declared that they participate in physical activity on a daily basis. Only 9.38% of respondents indicated that they participated in physical activity fewer than 3 times a week. Similar results were obtained in a study conducted among children aged 6-13 years from rural areas who attended schools in the Silesian and Opole Provinces [10]. According to this research, 59.27% of children spent their free time on physical exercise outdoors, while 21.95% of children declared regular training, and the remaining 18.78% of children chose passive rest.

Nevertheless, 24.56% of children aged 10 years in the study were obese. This problem concerned 28.89% of 11-year-olds and 27.13% of 12-year-olds and 13-year-olds. This phenomenon is very unfavourable, especially that in Poland a reduction in physical activity and excessive energy consumption in relation to demand is observed [11]. This was confirmed in the research conducted among young people aged 13-16 years, where only 8% of junior high school

students declared that they spend their free time actively [11]. The differences between these studies may be due to the fact that in the first study, children belonged to younger age groups who might be more likely to engage in physical activity than older children.

Attention should be paid to the amount of time devoted by children to physical activity. Most of the respondents indicated that they devote three to five hours a week to physical activity (39.90% - girls and 37.33% - boys) [10]. Other studies showed that physical activity is not undertaken by 17% of rural children and only 4.40% of children from the city. These results draw attention to the relationship between the place of residence and the level of physical activity (children from the city are much more likely to undertake physical activity). In addition, these studies compared the effects of overweight and obesity on the level of physical activity of children. According to the results, children with overweight or obesity most often have insufficient physical fitness, while in children with normal BMI, only 8% of respondents, had such a physical fitness rating [12].

According to the author's own research, 8.33% of children declared that they have breakfast fewer than three times a week. It should be noted that, according to the author's own research, younger children consumed breakfast much more frequently than the older ones. In the aforementioned studies, reverse trends were observed. However, according to Hałacz et al. [13], the first breakfast is consumed by as many as 96.18% of respondents. Studies conducted in the Silesian and Opole Provinces indicated that the first breakfast was consumed by only 64.39% of children [10]. These differences might be due to the latter study including younger children, who do not decide on their own whether they have breakfast before leaving for school [14].

Omitting the second breakfast was observed in a much larger group, while 32.29% of children consumed the second breakfast fewer than three times a week. In the study by Ramotowska et al. [14], it was observed that 14% of the respondents did not consume the second breakfast. The structure of the second breakfast is also worth attention. According to the author's own research, 8.33% of children choose a chocolate bar, while 7.29% consumed a sweet bun or a sweet croissant for the second breakfast. In other studies conducted in a group of 570 respondents aged 13 years, in which their lifestyle was assessed, including regular consumption of breakfast, fruit and vegetable food and physical activity, it was shown that over 50% of teenagers declared recurring bad health behaviours [14], [15].

## VI. CONCLUSIONS

Based on the obtained results, it was found that:

- Nutrition behaviours of children aged 10-15 years are unsatisfactory.
- Children rarely engage in physical activity. However, girls do it more often.
- Children do not eat breakfast every day. Children aged 10-12 years eat breakfast more often than children aged 13-15 years.

- Gender does not affect the frequency of eating the second breakfast.

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