

REVIEW PAPER

Nenad Nikolić,¹ Pandurević Milan¹¹Student of master studies, Faculty of physical education and sports, University of East Sarajevo**UDK: 796: 613.25-053.6****DOI: 10.7251/SIZ0217050N****THE INFLUENCE OF PHYSICAL ACTIVITY ON REDUCTION OF BODYWEIGHT FOR 10 YEAR OLDS***Summary*

The goal of this work is to determine the state of nutrition in children of school age of 10 years based on the level of their physical activity. The prevalence of excessive body weight and obesity between children is at rise in many countries in the world and even in Serbia. According to the information gathered in Institute of Public Health of Serbia “Dr. Milan Jovanović – Batut”, there is about 18% of moderately obese and obese young adults. Wrong diet and insufficient physical activity are considered as two of the most important causes of obesity with children and adolescents. The health of young people is important in every community, not only from the medical aspect, but also for the economic, social and demographic future of every country. That means that we should pay special attention to improving the health of young adults through healthy nutrition and regular physical activity. Results that are gotten with this research lead to the conclusion that one third of the examined children were inappropriately fed and 20% are overweight and obese.

Key words: *body mass index, obesity, FA, health of young adults*

1. INTRODUCTION

Obesity (lat. obesitas) is a chronic disease that is expressed with excessive accumulation of fat in organism and increased bodyweight. Each bodyweight increase that is more than 10 percent in comparison to the ideal weight is labeled as obesity. Every person whose body mass index (BMI) exceeds 30 kg/m² is considered obese (WHO, 2004). Many scientists consider that obesity is an illness of modern civilization and that an epidemic of obesity is on constant rise in almost all countries in the world. Excessive obesity creates complications on many organs and organ systems so it is considered to be main risk factor for occurrences of different illnesses, which directly influences the quality of life. Obesity can be equally present in all stages of life. In childhood it is equally present with boys and girls, and after puberty it is more common in women than in men. The prevalence of obesity with children is very concerning. Biggest percentage of obese children and young adults is marked in the USA where, according to some information, obesity of children aged 6-11 years old, has grown for 54% from 1960.

Increase of obese children is noticed with countries in development, in which the most prominent are countries of Middle East, North Africa and Latin America. As obesity is a consequence of imbalance between intake of calories originating from food, and spending energy and calories that are needed for basal metabolism and physical activity, physical activity has a very big influence in regulating body mass. Every factor that increases intake of energy in small measures or reduces energy consumption in longer period, can lead to obesity (Jovanović, Nikolovski, Radulović & Novak, 2010). Industrialization and urbanization and also economic-technological development have greatly changed food diet

and due to accelerated lifestyle have reduced physical activity and energy consumption. Although children obesity still isn't properly diagnosed, it is known that the prevalence of children obesity in the span of ten years in some countries has increased two to three times, and in some countries even four times (Ilić, Jelenković, & 2009). Children obesity is mostly tied to eating habits: irregular intakes and skipping meals, choice of groceries and excessive intake of certain foods (snacks, dough, candy and sodas), amount and frequency of physical activity, parental factors and influence of educational institutions. As the lack of physical activity in children nutrition is always ranked second by importance, it is obvious why regular physical activities are insisted on from the early stages of life. The level of physical activity among children depends on individual influences, also from the parental influences and environment, gender differences are also present (boys are mostly physically more active than girls), and age differences (children are more active than adolescents). The level of physical activity is in certain measures influenced by economic conditions, closeness of play and recreation place, parental support, socio-economic status and parental education and other factors (Zdravković, Banićević & Petrović, 2009). In order for the problem of children obesity to be reduced as much as possible, the primary task is to include regular physical activity at the earliest age.

2. FACTORS INFLUENCING OBESITY

There are many factors that influence obesity, among which are the most prominent (Despotović, Aleksopoulos, Despotović, & Ilić, 2013):

- overeating;
- physical inactivity;
- heredity;
- endocrine disorder;
- psychological factor and habits.

2.1 Nutrition

It is known that food intake is regulated by the nutrition center located in the hypothalamus. Food intake is regulated by the activity of one group of centers in the hypothalamus, while the neighboring centers in the brain regulate when to stop with food intakes by inhibiting the first centers. If the inhibiting centers are damaged, it comes to excessive overeating. Research has shown that food is taken excessively if it is easily available. It is proven that in 80% of the cases, obesity is a consequence of overloading with food, while only in 20% of the cases it is a consequence of endocrine disorder or a hereditary factor (Bukara-Radujković, & Zdravković 2008). Psychological factor is of great importance, not only for irregular, but also for the insufficient food intakes. Clinically depressed people often seek comfort in food. Some individuals enjoy food and drinks, and there are some who have created a habit of always having a snack. Creating regular eating habits in early childhood is of great importance in fighting obesity. However, it is often parents' fault for bad eating habits of their children, because they overfeed them, trying to show their affection and love for them that way.

2.2 Physical activity

Physical activity is a very important health factor, not only for the individual, but for the whole population as well. Its role is reflected not only in primary prevention of many chronic illnesses, but also in the secondary prevention that slows down and reduces the symptoms of chronic illnesses (Stoiljković, Živković, & Stošić, 2011). Aside from that role, physical activity also affects the mental stability of humans. According to WHO (World Health Organization), insufficient physical activity is a risk factor of its own. This organization has

sent an open letter a couple of times to all the governments in the world, in which it pointed out the exquisite importance of physical activity for total health of the population.

3. THE CONCLUSIONS OF TO-DATE RESEARCHES

A great deal of researches that has been implemented in the last two decades, came to the same or similar conclusions (Mahan, 2004; Bitar, Vernet, Coudert & Vermorel, 2006; Ilić, Jelenković, Vasić, 2009):

Frequency of the excessive body mass for children is on a very concerning increase;
Obesity is the second in line risk factor for occurrence of the disorder of children health;
Obesity in the period of childhood and adolescence is a prerequisite for obesity in mature age;
Health disorder due to obesity is the most frequent in the period of childhood and adolescence;
Physical activity has a significant influence in regulating excessive body mass for children;
Society must be involved in affirmation of physical activity which goal is to prevent obesity.

4. METHOD

A research was carried out in two elementary schools in Loznica during 2017. In this research participated a total of 70 students, 38 girls and 32 boys, and all of them were 10 years old.

Children's age	Sex	N	Total N (%)
10 year olds	Girls	38	36 (54,3%)
	Boys	32	32 (45,7%)
Total N (%)		70	100%

Evaluation of nutrition for kids was based on the following anthropometric indicators:

Height

Body mass and

Body mass index

Height was measured with floor anthropometer with a possibility of reading values closest to 0,5cm. Head was positioned in a "Frankfurt level", in a horizontal position, so that the line that connects tragus helix of the left ear with the lower edge of the eye orbit is positioned to be parallel with the surface.

Body mass is measured with a digital scale with a precision of 0,1kg. Body mass index (BMI) is calculated with formula: $BMI = BM (kg) / H^2 (m^2)$

The calculated values of height, body mass and body mass index, were compared to referenced values in the table of children's growth and development of World's Health Organization. Standard questionnaire is used for the evaluation of physical activity, socio-economic parameters and food habits. The questionnaire consists of questions from which the information was gotten about the time spent doing some physical activity during seven days, with answers: never, occasionally, often and always.

5. THE RESULTS OF THE RESEARCH

Average value for height (H) was 137,82cm for boys (the minimum was 131cm, and the maximum was 148cm). Average value for height was 138,42cm for girls (the minimum was 129cm, and the maximum was 149cm). Average value for body mass was 30,63kg for boys (the minimum was 27kg, and the maximum 37kg), while it was 31,58kg for girls (the minimum was 28kg and the maximum 38kg).

Average value for body mass index was 19kg/m² for boys (the minimum was 17kg/m², and the maximum 26kg/m²).

Table 1. Display of malnutrition, pre-obesity and obesity in the examined group

Age of the child	Malnutrition <P5	Pre-obese P85-P94	Obese >P95	Total
10 years	3 (4,28%)	6 (8,75%)	14 (20,0%)	26 (32,85%)

Evaluation of obesity in the examined group estimates that 26 respondents have a problem with body weight, which is 32,85% from the total number of respondents, and that is a percentage that can't be ignored. Also, the fact about the number of children that are malnourished or obese can't be overlooked. Tests that are used for evaluating the physical activity of respondents point out that both the boys and the girls are not enough physically active and that only 8 respondents are active in sports, while the rest are mostly physically active in P.E. classes. Most of the surveyed children said that they spend their free time in front of the TV and the computer and that they don't spend enough time outdoors doing physical activity.

Table 2. Display of results for testing for physical activity in the examined group

Physically active	N	%
Never	9	2,85
Occasionally	43	61,42
Often	10	14,28
Always	8	11,45
Total	70	100%

Looking at table 2 we can see that only 8 boys and girls were actively included in doing sports, and that is a negligible number in contrast to the number of surveyed children and their age. Overly fed and obese children are mostly physically inactive. The number of kids that are occasionally or completely physically inactive is also very concerning.

During the talk with the surveyed children the most used reasons for physical inactivity are listed below:

Lack of adequate sports; Small number of sports facilities and training grounds; Lack of time because of the extensive material that they have to master.

Based on the received responses about the presence of certain foods in the diet in the examined group, there is a moderate correlation between obesity and frequency of sugar intake, intake of non-alcoholic drinks and so called fast foods. It can be concluded that consumption of these foods has a certain influence on obesity in the examined group. Information on the parent employment shows that there is an insignificant correlation between parent employment and children obesity.

6. DISCUSSION

This research has also confirmed the thesis that the physical activity, beside the food diet, is an important factor for regulating children's body mass. The examined group is obviously physically inactive, and most of the children don't have a revelation how much the regular physical activity can contribute in regulating elevated or excessive body mass. Their disinterest for engaging in sports has been expressed through bigger number of surveyed children who have a problem with increased body mass. The reasons that children state for physical inactivity are not acceptable, especially if it is known that in Loznica exist adequate sport contents, that there is a large number of playgrounds and one sports Hall and that with little will you can always find time for necessary physical activity. The problem with obesity

mostly have children that are physically inactive, and at the same time have a problem with food diet (have irregular feeding patterns, take big amount of sweets and non-alcoholic soda drinks). If possible genetic factor is added to these data information, there is a precondition that those children will become obese at mature age. Because of these reasons it is necessary that with diet correction, children become active according to their abilities. In this process an important role have both teacher and parents and they can contribute to the physical activities of their children (Bojic-Milicevic, 1986). That role is not reflected only in limiting the time that their children spend watching TV or playing video-games, but also in giving good personal example and giving different possibilities to children to be physically active, whether it be going to the park, to the pool, the playground or having an active engagement in sports. Besides that, it is necessary for kids to be informed that obesity is a serious problem and that curing obesity is a long and complex process, and that in that process regular physical activity has a significant role. Exercising program for obese children should be based on medical knowledge, because the same exercises can't be applied to prevent obesity, curing obesity and maintaining the desired weight. Children of school age, besides the regular classes of P.E., should have the time for free activities of at least 15minutes a few times a day, for example playing football in school yard, riding a bicycle, playing hide-and-seek etc. Physically active children have stronger muscles and bones (it represents 70% of total body mass), which will prevent deformity occurrence and improve metabolism with which we regulate body weight (Jevtović, 2002). Thereby, they will have a good body posture.

7. CONCLUSION

Results that are gotten by this research lead to the conclusion that one third of surveyed children had an inappropriate diet, and that 20% of children are overweight and obese. Most of the surveyed children, aside from having irregular and bad food diet, are physically inactive. One of the possible causes gotten from the results is a professional disability and organization of work with children during the classes of P.E. Children mostly come to the classes of P.E., but their activity on these classes is not enough. Objective methods of measuring height, body mass and BMI, should have an advantage in regard to subjective answers of respondents which are given by answering the questionnaire. Different studies have shown that physical activity in early childhood is connected with better physical health, which includes better body posture, stronger bones and muscles, and also a better respiratory and cardiovascular function. Children that have regular physical activity are less successible to have chronic health problems. They have reduced risk of suffering chronic diseases and obesity. Physical activity has a positive effect on boosting confidence and reducing stress etc. Children usually don't need formal shapes of physical activity. Younger kids strengthen their muscles through games on playgrounds. Children should participate in activities that are appropriate for their age. Parents can influence their children's behavior in great measure regarding their physical activity. It's very important to encourage children to be physically active, be that through informal active games or organized sports. Because of its great importance, physical activity, as a proven preventive measure in fight against obesity and many other illnesses, must be present enough at all ages, and especially with kids. In advocacy of physical activity for healthier life, it is needed to have a support of whole society so that with healthy and content off-spring we could secure our future. Results of this research have confirmed this conclusion.

8. REFERENCES

1. Bojić – Milićević, G. (1986.) *Rast gojazne dece*. Novi Sad: Medicinski fakultet, magistarska teza.
2. Bukara – Radojković, G & Zdravković, D (2008) Determinacija gojaznosti kod dece i adolescenata. *Srpski arhiv za celokupno lekarstvo*, 136 (1-2), 22-27.

3. Bitar, A. Vernet, J., Coudert, J&Vermorel, M. (2006) Longitudinal changes in body composition, physical capacities and energy expenditure in boys and girls during onset of Puberty, *European Journal of Nutrition*, 39, 157-168
4. Despotović, M. Aleksopoulos, H. Despotović, M., Ilić, B.,(2013), Stanje uhranjenosti dece predškolskog uzrasta, *Medicinski časopis*, 47 (2), 62-68
5. Mahan, L.K.(2004) Family-focused behavioral approach to weight control in children. *Pediatric Clinics of North America*, 34, 983-996.
6. Jovanović, R., Nikolovski, D., Radulović, O., &Novak, S. (2010) Uticaj fizičke aktivnosti na stanje ishranjenosti dece predškolskog uzrasta, *Acta medica Medicanae*, 49 (1), 17-21
7. Jevtović, I. (2002), Medicinska statistika, Kragujevac. Medicinski fakultet, 2002.
8. Stoiljković, S., Živković, M., Stošić, D., (2011) Fizička aktivnost i ljudsko zdravlje. *Sport i zdravlje*, 6 (1), 54-59.
9. Ilić, M., Jelenković, B., Vasić, B., (2009) Učestalost gojaznosti i povećanog rizika za nastanak gojaznosti kod dece pred upis u školu u Zaječaru, *Timočki medicinski glasnik*, 34 (1), 136.
10. Zdravković, D., Banićević, M., Petrović, O., (2009). *Novi standardi rasta i uhranjenosti dece i adolescenata*. Priručnik za primenu novih standarda rasta SZO 50-51.
11. WHO (2004) Regional Publications European series. No 96. *Food and Health in Europe: a new basis for action WHO*: Copenhagen: World Health Organization.

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