

Jasmina Milanović*

SEDENTARY BEHAVIOR AT OBESE CHILDREN AND YOUTH

Summary: This work presents a research of sedentary behavior at obese children and youth, which was examined considering the amount of time spent on activities that include computers and television, and the amount of children's physical engagement. The sample is made of 375 obese children and adolescents, aged 12-18 years, 47.7% of which are male, and 52.1% female. They all filled in the questionnaire designed for the purpose of "Cigotica" program. The questionnaire examined the amount of time spent on sedentary behavior. The children's perception of the amount of time spent watching television and using the computer is 4.9 hours, and it is lower than parent's perception, 5.2 hours. The frequency analysis shows that 79.9% of these children do not practice regular sports activities, and also that only 30.7% of them has hobbies, most of which include sedentary behavior. Differences between males and females were found by comparing means of the amount of time spent using television and computer, as well as the amount of physical engagement through sport activities and hobbies. These results are coherent to the results of previous research of effect of sedentary behavior on obesity.

Key words: child obesity, sedentary behavior, physical activities

Introduction

Overfeeding and obesity are defined as abnormal accumulation of fat that can endanger one's health (WHO). The primary obesity emerges as a result of imbalance between the amount of energy brought in and the amount of energy spent, meaning that the amount of energy brought in by food is significantly larger than the amount of energy spent in physical activity. Secondary obesity is the result of

* Pshychologist, *The Special Hospital for Thyroid and Metabolism Zlatibor*, Zlatibor.

genetic and endocrine disorders, brain lesions and iatrogenic causes. (Banićević M et al, 2007.).

It is still not possible to know what is the share of genetic, neuroendocrine, metabolic, socially-economical, environmental and psychological causes in creating obesity, but their interaction is certain (Raj, M.; Kumar, R. K, 2010.). The other problem is the difference between methodologies of exploring causes from endocrine, genetic, psychological and socially-cultural perspective, as well as low possibility of comparing results from these perspectives.

The most mentioned causes of primary obesity are: the breastfeeding period, the child's mental disorder (Braet C. et al, 2010), the parents' mental disorder (Dejvisa et al., 2011.), social-economic status, psychosocial characteristics and sedentary behavior. Sedentary behavior includes sitting, lying down, spending extremely small amounts of energy and is different from low physical activity, which means that the amount of energy spent is somewhat larger and includes standing up, personal hygiene activities and slow walk (Owen N. et al., 2010.). However, these two terms are in surveys combined in one, the term sedentary behavior. Sedentary behavior can include different kinds of behavior, depending on researcher's preferences. In this research sedentary behavior will be measured considering the amount of time spent using computer and television, practicing hobbies and sport activities.

In Iran obese girls come from families with low economic status, with obese parents who have a habit of omitting breakfast. According to author's words, among many factors examined, these two (low social and economic status, omitting breakfast) are in the strongest relation with girls' obesity. However, the author also says that Iranian women have no culture of practicing physical activities because of religious reasons. There is no data of these girls' physical activities. The average time they spend on watching television is 3.5+-1.7 hours a day (Maddah, M.; Nikooyeh, B., 2010.). Adolescents in Taiwan spend, on average, 450 minutes a day watching television, using the computer, or in other kinds of sedentary behavior. Girls spend more time watching the television, whereas boys spend more time using the computer. The amount of times spent in sedentary behavior on weekends is raised up to 480 minutes for boys and up to 510 minutes for girls (Liou, Y. M.; Liou, T-H.; Chang, L-C, 2010.). In UK boys spend 243 minutes a day in sedentary behavior, 56% of that time watching television, whereas girls spend 331 minutes a day in sedentary behavior, and 31% of that time watching television. The amount of time spent on these activities and the percentage for watching television is raised during weekends. That study implies high negative correlation between times spent watching television and time spent on other sedentary or physical activities (Biddle, S.; Gorely, T.; Marshall, S., 2009.). Apart from sedentary behavior while watching television, there is also the effect of presence of working television device on sleep disorders, i.e. adolescents who have TVs in their bedrooms sleep significantly shorter than necessary, raising up the risk of becoming obese (Must, A.; Parisi, S. M, 2009.).

The half of European children age 11 is physically engaged in sport activities 5 days a week, but this percentage is declined with examinee's age. National differences between children's and adolescents' physical engagement are great, but one constant is found – girls are less physically engaged than boys (WHO, 2009.). There are varieties of preferences in sport, but the physical activity that the obese children most frequently name as favorite is “fun” (Power, T. G.; Bindler, R. C.; Goetz, S.; Daratha, K. B, 2010.).

Child and adolescent obesity is related to numerous health issues and disorders that emerge in childhood, as well as ones that last for a lifetime. Obesity is directly related to disorders of cardiovascular, respiratory and endocrine systems. Obesity causes gynecological, metabolic, orthopedic, and number of other disorders and changes (Lešović, 2010a; Lešović 2010b).

There is a clear link between the self-image child has of its body, and belonging to a certain body type. Obese children and adolescents show more dissatisfaction with their physical appearance, lower self-confidence and more depressive symptoms compared to normally fed and underfed children (Goldfield et al., 2010.). The chances of appearance of those difficulties and disorders among other numerous organic diseases are 2-3 times higher in population of children diagnosed with autism and Down syndrome compared to intellectually healthy children (Rimmer, J. H.; Yamaki, K.; Davis Lowry, B. M, 2010.). Girls in Jamaica have wrong self-image of their body; they perceive their BMI as significantly lower than it really is, whereas boys have more realistic body self-image, but they would like they BMI to be higher. In both cases, there are problems in changing lifestyles, because there is no insight in obesity as an illness with high risk factors of future health problems (Barrett S.C., Huffman F. G., 2010.).

People who practice more physical activities have a better mental health. The number of hours spent sitting down is inversely proportional to physical and social functioning, vitality, physical pain and emotional engagement, i.e. the more time spent sitting down – the worse physical and psychological health (Balboa-Castillo, T et al. 2011.).

The data about sedentary behavior in Serbia are not very numerous, and this study is trying to provide results that will be useful, above all, for prevention and rehabilitation that children with this diseases need, as well as education for medical staff working on prevention in elementary and secondary schools and student homes. Even though prevention is the basic problem, nurses don't have adequate knowledge of that problem, and that is an obstacle in healthy lifestyle promotion, because school boards are expected to help promoting the program (Nauta, C.; Byrne, C.; Wesley, Y., 2009.). While nurses expect help from schools, teachers blame children's obesity on their parents, parents blame it on children, and adolescents find excuses for their unhealthy lifestyle in situational occasions (Power, T. G.; Bindler, R. C.; Goetz, S.; Daratha, K. B, 2010.).

The goals of this research are: 1) to find what amount of time obese children spend using the computer and television by examining children's and parents' perception; 2) to find how many of the obese children are physically engaged in regular sport activities; 3) to find out how many children have hobbies, and what kind of hobbies;

4) to find out is there a gender difference in the amount of time spent in certain aspect of sedentary behavior.

To maintain a normal body weight (BMI= 20- 25) it is recommended to spend maximum 2 hours a day using the computer and television. With our examinees being obese, it is justified that they spend more than 2 hours a day using computer and television. This assumption is coherent with the studies conducted in Iran and UK. Obesity is caused by low level of physical activity, because of which it is expected that most of the examinees doesn't practice regular sport activities and that their hobbies demand minimal physical engagement. It is also assumed that there will be gender differences, i.e. girls spending more time watching television, and boys spending more time using the computer.

Method

Sample: Sample is made of 379 children and adolescents age 12-18, who have been to "Cigotica" programme from June 2011 to February 2012. The sample is made of 197 girls and 181 boys that have been sent to "Cigotica" from over 20 Serbian towns, from different religious, national and social-economical environments.

Tab. 1: *Frequency and percentage of obese children and adolescents by gender and age*

age	male	%	female	%
12	29	16.0	21	10.7
13	43	23.8	40	20.3
14	29	16.0	35	17.8
15	13	7.2	26	13.2
16	28	15.5	35	17.8
17	27	14.9	27	13.7
18	12	6.6	13	6.6
total	181	100	197	100

Variables and instruments: Independent variable is gender, which is a naturally binary category. Dependent variable is sedentary behavior, described using the amount of time spent on the computer and television, sport activities and hobbies.

The questionnaire contains 20 questions, 4 of which are relevant to the study. They rely on time spent on: 1) watching television; 2) using the computer – for videogames and internet (not for homework); 3) practicing hobbies (what kind of hobby); 4) practicing sports (what kind of sport). The questionnaire for parents also contains 20 questions, 2 of which are relevant to the study. They rely on the amount of time that child spends on: 1) watching television; 2) using the computer – for videogames and internet (not for homework).

The time spent on the computer and television is determined by calculating means. Frequency analysis was used for determining the number of examinees that actively practice sorts. Using the quality analysis, hobbies were categorized as hobbies that require sitting or using minimal amount of energy or as hobbies that require physical activity. The hobbies were put through frequency analysis. Linear correlations is used to determine the level of children’s and parents’ perception matching. Comparing means for groups is used for determining gender influence. All these analysis were performed by SPSS software package.

Procedure: Participants filled in the questionnaire before the beginning of the treatment, as the part of registering for the treatment. Both parents and children in the “Cigotica” programme were given clear instructions about filling in the questionnaire. The average time for filling in the questionnaire is 20 minutes.

Results

The amount of time spent sitting in front of the computer and television is measured using means and standard deviations. Calculated values are presented in Tab.2.

Tab. 2: Means and standard deviations of parents’ and children’s perception of time in hours spent using the computer and television

	N	M	SD
Time spent watching television, child’s perception	375	2.33	1.52
Time spent watching television, parent’s perception	370	2.51	1.57
Time spent using the computer, child’s perception	377	2.60	1.79
Time spent using the computer, parent’s perception	370	2.73	2.05

The tab shows that, according to both children’s and parents’ account, the larger amount of time is spent in front of the computer, than in front of the TV. The both values are higher from parents’ than children’s perspective, but the level of coherence between children’s and parents’ perspective is high, as shown in the linear correlation tab.

Tab. 3: The correlation between children’s and parents’ perception of time spent in hours using the computer and television

	Time spent watching television, child’s perception	Time spent using the computer, child’s perception
Time spent watching television, parent’s perception	.838**	
Time spent using the computer, parent’s perception		0.770**

**significance level 0.01

The assumption of gender influence is explored by comparing means for males and females.

Tab. 4: *Means and Standard deviations for children's and parents' perception of time spent in hours using the computer and television by gender*

	N	M	Std. D
Time spent watching television, child's perception			
females	196	2.39	1.59
males	179	2.28	1.44
Time spent watching television, parent's perception			
females	196	2.57	1.63
males	174	2.44	1.49
Time spent using the computer, child's perception			
females	196	2.21	1.48
males	181	3.04	1.99
Time spent using the computer, parent's perception			
females	196	2.24	1.59
males	174	3.30	2.35

The Tab.4 shows the influence of gender, with female participants spending more time watching television, whereas male spend more time using the computer. Parents' perception follows that pattern, with the slight difference in the amount of time.

Tab. 5: *Frequencies for variable Sport activity (total and by gender)*

	total		female		male	
	f	%	F	%	f	%
yes	76	20.2	35	17.9	41	22.7
no	259	68.9	141	71.9	118	65.2
occasionally	41	10.9	20	10.2	21	11.6
	376		196		181	

68% in total do not practice any sport, females (71.9%) less than males (65.2%).

Tab. 5: *Frequencies for variable Hobbies (total and by gender)*

	total		female		male	
	f	%	F	%	F	%
Doesn't have a hobby	116	30.6	48	24.4	68	37.6
Has a hobby	262	69.3	149	75.6	113	62.4
	378	100	197	100	181	100

69.3% in total do not have a hobby, whereas 75.6% of female examinees do not have a hobby.

Named hobbies are categorized as hobbies that require sitting down or using the minimal amount of energy or as ones that require physical activity. The category of sedentary behavior supporting hobbies includes art-related hobbies – playing musical instruments and going to music school (5), singing in chore (2), singing and listening to music (3), acting (3), reading and writing poetry and prose (4), drawing and painting (5). Besides art-related hobbies, this category also includes sport hobbies that require minimal energy – archery (1), and some unusual hobbies – nail polishing, collecting postcards, icon writing, etc. (see Addition1).

In the category of hobbies that require a higher level of physical engagement the most common are: folklore dancing (10), roller-skating (2), swimming (2), bicycle riding (1), dog walking (1), walking (1), running (1) and hip-hop dancing (1).

Sport hobbies mentioned here are the ones that are practiced at least once a month as an entertainment with school friends and neighbors – fitness (2). Some of the participants have more than one hobby, and all of their hobbies are considered and categorized.

The frequencies show that more than half of the girls that have any hobbies (24.4%) have a sedentary behavior supporting hobbies.

37.6% of male examinees have a hobby. The category of sedentary behavior supporting hobbies includes art-related hobbies – playing musical instruments and going to music schools (12), reading (6), drawing and painting (5), acting (3), chore singing (1). Besides art-related hobbies, this category also includes sport hobbies that require minimal energy – fishing (7) and archery (1), and some unusual hobbies – rabbit breeding, telephone technology, etc. (7) (see Addition1).

In the category of hobbies that require a higher level of physical engagement the most common are: table tennis (4), folklore dancing (3), bicycle riding (2), hip-hop dancing (2), swimming (2), roller-skating (1) and walking (1). Sport hobbies mentioned here are the ones that are practiced at least once a month as an entertainment with school friends and neighbors – soccer, basketball, water polo, kickboxing, handball, etc. (21 total). Some of the participants have more than one hobby, and all of their hobbies are considered and categorized.

Discussion

The time that Serbian obese children spend in sedentary behavior is similar to the time that obese children from all around the world spend in sedentary behavior. Participants report that they spend in average 4.9 hours a day in front of the computer and TV, whereas their parents report that time to be up to 20 minutes longer. This difference is probably the result of parents' more objective evaluation. Still, the level of parents' objectivity can be questionable, considering that the degree of parents' insight in children's behavior is shrinking due to computers and TVs usually being in children's bedrooms, so parents don't always know if their children use these devices until late at night. The hypothesis about using the computer and television for over 2 hours a day is confirmed (unfortunately, over two hours is spent on each of these two devices). These findings are coherent with findings of studies in Iran and Taiwan. The findings also show that Serbian children watch more TV than children from UK. Participants use the computer in average for 18 minutes longer than they watch television (they use the computer in average for 2 hours and 43 minutes). The reasons for spending more time in front of the computer probably lie in the possibility of interaction, and the possibility to actively choose the content which they want to participate in (unlike television, where users are passively receiving given content). The attractiveness of the internet to the young people is probably the result of meeting other people their age, and other people who share their interests by using social networks. Watching amusing contents (jokes, amusing videos, interesting photos, etc.) is another reason these children are so fond of the internet.

The hypothesis of decreased physical activity is also confirmed. Only 20.2% of the participants report they practice sports on regular bases. This finding confirms Balboa-Castillo findings that the number of hours spent in sedentary behavior is inversely proportional to physical functioning. Again coherent to the previous findings, averagely 5 hours are spent in front of TV and the computer; at least 6 hours are spent in school; 8 hours are spent sleeping (optimal amount for examinees' age), leaving only 5 hours a day for meals, studying, free time activities and going from home to school and back. This shows that it is almost impossible to find the time for physical activities. However, this research does not show if the examinees are not motivated enough for physical activities because of lack of time, or because they require investing and determination, which makes them less interesting than computers and television. The findings of Paver and his associates also confirm that obese adolescents usually choose fun as their favorite physical activity (Power, T. G.; Bindler, R. C.; Goetz, S.; Daratha, K. B, 2010). Low self-esteem and low self-respect, as well as the social refusal can also be the causes of physical inactivity, although the question of what is the cause, and what is the aftermath still remains unanswered.

It is also possible to confirm the hypothesis that obese children have sedentary behavior supporting hobbies, because half of them that have any hobbies practice activities that require only occasional physical engagement. However, only 30% of the

participants have a hobby (half of which only practices occasional physical activities), which makes 85% of the participants physically inactive. As said above, the possible reasons can be found in the lack of time, low motivation due to low self-esteem and social functioning, and low attractiveness of these contents.

By gender comparing, differences are found between using the computer and television – females use TV more, males use computer more. This result is coherent to hypothesis of gender influence, as well as to the results of research in UK, Iran and Thailand. This can be explained by the fact that playing videogames is more significant to males than to females. Using quality analysis of children's hobbies, it is found that males practice more hobbies related to computer work (Addition1), which also explains why males spend more time in front of the computer. Differences were also found in the level of physical engagement in sport activities and hobbies – girls are less engaged in both cases. This result follows the pattern of WHO results, proving that our sample is not nationally specific.

The results of this research show that sedentary behavior has a significant effect on emerging obesity and its maintaining. These results are coherent to those found for examinees from all over the world, showing the universality of sedentary behavior's effects on obesity. In order to use these findings as a confirmation of effect that sedentary behavior has on obesity, it is necessary to examine other important aspects of becoming obese (such as age differences in sedentary behavior) to get the big picture. It is also necessary to include psycho-social characteristics, religion, nationality and economic factors, which have already been proven significant in effecting obesity (Maddah, M.; Nikooyeh, B., 2010.). These are also the flaws of this research. A more precise defining of sedentary behavior would enable making more precise instruments which would be able to separate different aspects of using computers and television. These data would provide the clearer big picture of what is the enemy that has to be battled (TV shows, movies, social networks, videogames, reality shows), which would be a priceless information for preventive work. This research shows a need for more detailed examination of causes of gender differences in practicing physical activities, i.e. discovering are these findings psychological, sociological or cultural specificity of our examinees.

References

- Balboa-Castillo, T.; León-Muñoz, L. M.; Graciani, A.; Rodríguez-Artalejo, F.; Guallar-Castillón, P. Longitudinal association of physical activity and sedentary behavior during leisure time with health-related quality of life in community-dwelling older adults.. *Health & Quality of Life Outcomes*, 2011, Vol. 9 Issue 1, p47-56, 10p
- Barrett, S. C.; Huffman, F. G. Comparison of self-perceived weight and desired weight versus actual bodymass index among adolescents in Jamaica. *Revista Panamericana de Salud Pública*, Apr2011, Vol. 29 Issue 4, p267-276, 10p

- Banićević M., Zdravković D., Bogdanović R., Radulović N., Crnčević N., Projekat Prevencija i lečenje gojaznosti kod dece i adolescenata u Srbiji, Institut za štitanu žlezdu i metabolizam – Zlatibor i Udruženje pedijatara Srbije, 2007.
- Biddle, S.; Gorely, T.; Marshall, S. Is Television Viewing a Suitable Marker of Sedentary Behavior in Young People? *Annals of Behavioral Medicine*, 2009, Vol. 38 Issue 2, p147-153, 7p,
- Braet, C.; Jeannin, R.; Mels, S.; Moens, E.; Van Winckel, M. Ending Prematurely a Weight Loss Programme: The Impact of Child and Family Characteristics *Clinical Psychology & Psychotherapy*, Sep/Oct2010, Vol. 17 Issue 5, p406-417, 12p,
- Goldfield, G. S.; Moore, C.; Henderson, K.; Buchholz, A.; Obeid, N.; Flament, M. F. Body Dissatisfaction, Dietary Restraint, Depression, and Weight Status in Adolescents *Journal of School Health*, Apr2010, Vol. 80 Issue 4, p186-192, 7p,
- Davis, M., LaShun Y., Davis, S. P. Moll, G. Parental Depression, Family Functioning, and Obesity among African American Children *ABNF Journal*, Summer2011, Vol. 22 Issue 3, p53-57, 5p,
- Liou, Y. M.; Liou, T-H.; Chang, L-C. Obesity among adolescents: sedentary leisure time and sleeping as Determinants *Journal of Advanced Nursing*, Jun2010, Vol. 66 Issue 6, p1246-1256, 11p,
- Lešović S., Metabolic syndrome in the participants of the Cigotica programme *Medicinski glasnik*, 2010, Vol 15 Issue 33, p 28-35, 7p
- Lešović S. First experiences of the Cigotica programme *Medicinski glasnik*, 2010, Vol 15 Issue 34, p 70-81, 11p
- Maddah, M.; Nikooyeh, B. Obesity among Iranian Adolescent Girls: Location of Residence and Parental Obesity *Journal of Health, Population, & Nutrition*, Feb2010, Vol. 28 Issue 1, p61-66, 6p
- Must, A.; Parisi, S. M. **Sedentary behavior and sleep: paradoxical effects in association with childhood obesity.** *International Journal of Obesity*, Apr2009 Supplement 1, Vol. 33, pS82-S86, 5p
- Nauta, C.; Byrne, C.; Wesley, Y. School Nurses and Childhood Obesity: An Investigation of Knowledge and Practice Among School Nurses as they Relate to Childhood Obesity. *Issues in Comprehensive Pediatric Nursing*, Mar2009, Vol. 32 Issue 1, p16-30, 15p,
- Owen N, Sparling PB, Healy GN, Dunstan DW, Matthews CE, Mayo Clinic Proceedings. Mayo Clinic [Mayo Clin Proc], Sedentary Behavior: Emerging Evidence for a New Health Risk ISSN: 1942-5546, 2010 Dec; Vol. 85 (12), pp. 1138-41
- Power, T. G.; Bindler, R. C.; Goetz, S.; Daratha, K. B. Obesity Prevention in Early Adolescence: Student, Parent, and Teacher Views. *Journal of School Health*, Jan2010, Vol. 80 Issue 1, p13-19, 7p,
- Raj, M.; Kumar, R. K. Obesity in children & adolescents *Indian Journal of Medical Research*, Nov2010, Vol. 132 Issue 5, p598-607, 10p
- Rimmer, J. H.; Yamaki, K.; Davis Lowry, B. M. Obesity and obesity-related secondary conditions in adolescents with intellectual/developmental disabilities. *Journal of Intellectual Disability Research*, v54 n9 p787-794 Sep 2010.
- Saltó M.J.C., Percentage of physically active children and adolescent, WHO, ENHIS, fact sheet 2.4, Dec2009.

Addition 1:

female	male
nail art	Rabbit breeding
Icon painting	3d modeling
Clay, Italian language	Telephone technology
Postcard collecting	Playing videogames
Studying the entire book	preferans, chess
shopping	Music production
Making jewelry	Programing