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Nutrition, physical activity and lifestyle as important indicators for the body mass index in high school students

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Abstract

The purpose of this study was to investigate and analyze the problems of underweight, overweight and obesity in young people of high school in Drenas, respectively a sample of 150 adolescents (73 males and 77 females aged 17 years). The research was conducted in the physical education class, initially was performed measurement of weight and height then the questionnaire with 26 questions. Data were collected with the statistical program SPSS version 21.0, descriptive analysis was performed with (Mean and standard deviation), all variables were tested for normality, significant level (significant level $p < 0.05$). Results of anthropometric characteristics, the average age was 17.2 years. Weight / kg for men was 59.4 kg for women 57.3kg the average for both genders was 58.3 (± 6.2) kg. Height / cm males 1.68cm, females 1.61cm the average of both genders was 1.64 (± 6.6) cm. BMI body mass index kg / m² in men 21.0, women 22.1, the average of both sexes 21.55 kg / m5. The results show that men have lower BMI ($p > 0.05$) 21.55 kg / m² than girls with 22.1 kg / m². Data showed underweight males are 12%, and females 10%. BMI Normal male 74%, and female 69%. Overweight males 11%, females 13% while a significant difference was observed between obese boys and girls (obese) males 3% and females 8%. The analysis of the questionnaire showed that small percentages are involved in collective or individual sports, the most pronounced participation in sports was

identified: football, volleyball and basketball, and relatively satisfactory were physical activity in household activities. It is recommended to build outdoor fitness and sports gyms, as well as the opening of various sports clubs in this area, and to have more research in this area, to prove the institucions how important are places for sport and physical activities.

Key words: Physical activity, health, sports engagements, overweight, obesity.

Introduction

Physical activity and movement is a vital process that offers a better quality of life. The benefits of physical activity for mental and physical health in children and young people have been shown and are constantly being shown, as quite useful and necessary. Physical activity includes any form of muscular body movements such as: walking, running, dancing, dancing, various games, swimming, skiing, etc. Being active during school hours and outside it has brought many physical, psychological, social and well-being benefits. Unfortunately many children and young people do not reach enough activities in order to benefit from them and have a healthier lifestyle (Smedegaard et al., 2016). Passivity and malnutrition showed significant health risks, such as chronic diseases, diabetes type 2, cardiovascular and respiratory diseases, and obesity as the main concern (Charlen et al., 2011). Inactivity and passive lifestyle are quite risk factors for obesity in children and adolescents (Adam et al., 2016). Healthy nutrition, balance of macronutrients and micronutrients as well as being physically active plays a very important role in the normal growth of children both muscular and skeletal. To ensure maximum benefit in healthy bone formation and fermentation should be consumed sufficient amount of calcium from the food (Julia et al., 2015). A study conducted by Rocio (2013) shows how physical activity contributes to the primary and secondary prevention of various chronic diseases, also improves blood pressure. The prevalence of overweight and obesity in children is increasing at a fairly high intensity in all countries of the world, including Europe (Wang et al. 2002). Obesity

in early childhood can have serious consequences even at a young age and can be followed by various diseases throughout life (Lobstein et al. 2003). Another reason to focus their efforts in early childhood on the prevention of Obesity is that a study shows the Body Mass Index (BMI) at a young age is followed approximately the same in the following years, so it is shown that children of 3 years old who were overweight or obese three out of five of them were obese at the age of 12 years, while those who were at normal weight at the age of 3 years were not overweight or obese at the age of 12 years (Eliana et al., 2007). Passivity and malnutrition is spreading rapidly, this has been shown by many different researches and one of them has been used with a questionnaire with a very high validity and effectiveness where it was called the International Physical Activity Questionnaire (IPAQ) which has been developed as an international instrument for monitoring physical activity and lifestyle (Cora et al., 2003). The (IPAQ) although is very popular and is used by many researchers, its validity was questioned by Javier (2016) where proved that the final results of the research were not very convincing and argumentative, but after the realization and comparison of this questionnaire and measurements of children with Axolometer concluded that the questionnaire data are valid. By analyzing the rapid development of technology, malnutrition and inactivity, schools can be important factors in promoting physical activity, games and healthy eating habits which could be achieved with the inclusion of all students, by equipped school with the basic equipment for the realization of games, the as well as the use of space outside the school (Wijnhoven et al., 2014). Self-reported physical activity questionnaires are relatively not expensive and easy to administer, and have thus been the main tools for monitoring physical activity in big groups of population studies. However, there was a lack of consensus on the preferred questionnaire for use in these situations. In response to the global demand for comparable and valid measures of physical activity within and between countries, an international consensus group has developed an (IPAQ). The purpose of IPAQ is to provide a range of well-developed instruments that can be used internationally to obtain comparable physical activity assessments (Craig et al. 2003). Physical activity is defined as body movement that is produced by skeletal muscle contraction and significantly increases energy expenditure (US Department of Health and Human Services 1996). This term therefore includes the full range of human movement from competitive sports, relaxation exercises, hobbies or activities involved in daily life. On the other hand, physical inactivity can be

described as a place where physical activity is minimal and energy expenditure is quite low (Miles et al. 2007).

Material and Methods

This research was conducted in the Technical High School "Fehmi Lladrovci" for the implementation of this research and its purpose was informed to the competent authorities and was allowed to be conducted. Initially, the schedule was coordinated with the professors of physical education, the questionnaire and the measurement of students was realized with their support and presence. In the process, students were informed about the purpose, objectives and goals of this research. The questionnaire was compiled with a total of 26 alternative questions as well as open questions, the questions were easy to understand and did not violate the privacy of students, after completing the questionnaire was measured the length and weight of students with a digital scale. One hundred and eighty (180) subjects participated in the research for the realization of the questionnaire and the measurement of weight and height. The subjects who did not complete the questionnaire were (n = 18) or the technical errors in the instrument (n = 12) that were (n =30) not valid. The final sample size was 150 adolescents (n = 73 boys, n = 77 girls).

Measurements

The measurement procedure was standardized, initially the scales were basically performed before the measurements started. Students had to be placed on scales without shoes, so only in socks. Using a stadiometer, the student's length was correctly measured. The body had to stay straight, with a 90˚ head angle and a straight view. Weight measurement was performed with digital scales.

Questionnaire

As the instrument of the research was used the questionnaire, which has been used previously in many researches. Initially the reliability of the questionnaire was realized with a sample of 37 students. It has been proven that the tests have acceptable validity and reliability. The questionnaire aimed to realize and inform directly from the real situation of students about their lifestyle, different types of sports and activities. The questionnaire included 26 questions. The

questionnaire is designed to show the average time spent doing the activity within the last 12 months: Less than once a month, Once a month, 2-3 times a month, 1 time per week, 2- 3 times a week, 4-5 times a week, 6 or more times a week.

Testing procedure

Each participant was informed about the aim of research, they were informed about the procedures on how to complete the questionnaire, the methods on how to fulfill the alternatives and all other procedures where they were explained by the researchers, also some tests were performed to fully understand the procedures. The researchers were there to help the students to assist and clarify any possible ambiguities from the students. The questionnaires were distributed to the students and a simple pen, their data was confidential, they only marked the grade and gender. For completing the questionnaire students had 30 - 35 minutes available, then the measurement of body weight and height. It is worth mentioning that all data were confidential, and students did not have access to look at the height and weight of peers, except for students who were individually informed about those two measurements.

Statistical Analysis

The data that has been collected during the research were placed in the statistical program SPSS version 21.0, descriptive analysis was performed with (Mean and standard deviation) calculating the achievement of variables, all variables were tested for normality, (significant level $p < 0.05$).

Results

Table 1 shows the results of anthropometric characteristics of 150 adolescents (n = 150), in this table is shown the average of (age, weight and height) and is calculated the BMI (body mass index). The average age of males is 17.1, while that of females is 17.2, the average age of both sexes is 17.2 (± 1.1) years. Weight / kg for men is 59.4, for women 57.3, the average for both sexes 58.3 (± 6.2) kg. Height / cm in males 1.68, in females 1.61, the average of both sexes 1.64 (± 6.6) cm. BMI kg / m in men 21.0, in women 22.1, the average of both sexes 21.55 kg / m. in table 1 shows that men have lower BMI ($p > 0.05$) 21.55 kg / m^2 than girls with 22.1 kg / m^2. Table 2 compares the BMIs of men and women and is categorized in (%). BMI underweight males 12%, and females 10%. BMI Normal males 74%, and females 69%. Overweight males

11%, females 13% while a significant difference was observed between boys and girls Obese males 3% and females 8%.

Table 1. Anthropometric characteristics N=150

Gender	Male (n=73)	Female (n=77)	Total (n=150)
Age	17.1 (±1.1)	17.2 (±1.3)	17.2 (±1.1)
Weight/kg	59.4 (±5.6)	57.3 (±6.8)	58.3 (±6.2)
Height/cm	1.68 (±7.3)	1.61 (±5.9)	1.64 (±6.6)
BMI kg/m²	21.0 kg/m²	22.1 kg/m²	21.55 kg/m²

Table 2. Comparison of male and female in the BMI category (%)

Categories	Male (%)	Female (%)	Total (%)
Underweight	12%	10%	11%
Normal	74%	69%	72%
Overweight	11%	13%	12%
Obese	3 %	8%	5%

Table 3. Participation of adolescents in sports and recreational activities

Variable	Activities carried out in the last 12 months						
	Less than once a month	Once a month	2-3 time in month	1 time a week	2-3 times a week	4-5 times a week	6 or more times a week
Competitive swimming	99%	0%	1%	0%	0%	0%	0%
Free Swimming	94%	3%	2%	0%	1%	0%	0%
Hiking or mountain climbing	87%	6%	4%	2%	1%	0%	0%
Walking for fun	78%	9%	6%	4%	2%	1%	0%
Cycling race or something similar	98%	2%	0%	0%	0%	0%	0%
Cycling for fun	79%	7%	5%	4%	3%	2%	0%

Table 3 shows a very low number that is active with these activities, where it is observed that adolescents, respectively respondents from the municipality of Drenas very few perform activities in the water, free or competitive swimming, where over 94% of them do less swimming that once a month and only 1% participate in swimming competition. In the questions of hiking and cycling, it is noticed that in hiking or mountain climbing over 87% do not participate even once a month, while in walking for fun 9% once a month, 2-3 times a month

only 6%. In cycling competitions it is noticed that this group of respondents is not active at all in any professional club. While cycling for fun takes a relatively small number.

Table 4. Adolescents' participation in household chores

Variable	Activities carried out in the last 12 months						
	Less than once a month	Once a month	2-3 time in month	1 time a week	2-3 times a week	4-5 times a week	6 or more times a week
Grass cutting in the season	24%	21%	34%	12%	7%	2%	0%
Irrigation of grass or garden in summer	11%	13%	19%	22%	24%	9%	2%
Pruning of trees	61%	21%	10%	6%	2%	0%	0%
Digging the ground or cutting wood	58%	19%	14%	6%	2%	1%	0%
Car maintenance or home furnishings	7%	10%	14%	16%	20%	25%	8%

Table 4, elaborates the findings from the physical engagements of the house, where it is noticed that there is a very good participation from the adolescents. To the question: grass cutting, 21% cut the grass 1 time per month, 34% 2 times a month, 12% 1 time a week 7% cut the grass 2 times a week, also in watering the grass and garden we have a satisfactory %, while the activities the most common they do is maintenance of cars or household furniture, 8% perform these tasks 6 times a week, 25% 4-5 times a week, 20% 2-3 times a week.

Table 5. Adolescents' participation in individual and group sports

Variable	Activities carried out in the last 12 months						
	Less than once a month	Once a month	2-3 time in month	1 time a week	2-3 times a week	4-5 times a week	6 or more times a week
Gymnastics Exercises	97%	0%	0%	1%	2%	0%	0%
Weight training	79%	2%	3%	4%	6%	6%	0%
Conditional exercises, Bicycles or rotating tracks.	68%	4%	5%	7%	8%	7%	1%
Exercise extension to stay fit or yoga	72%	3%	5%	6%	7%	6%	1%
Dancing	64%	14%	9%	6%	3%	3%	1%
Runs	43%	13%	14%	11%	12%	5%	2%
Bowling	91%	4%	3%	2%	0%	0%	0%
Tennis or Badminton	88%	4%	3%	2%	2%	1%	0%
PingPong	81%	6%	4%	3%	2%	4%	0%

Golf	99%	1%	0%	0%	0%	0%	0%
Football	37%	23%	16%	12%	7%	4%	1%
Volleyball, Basketball	29%	25%	15%	17%	8%	3%	3%
Merciale Arts	75%	5%	3%	4%	5%	6%	2%
Skating	98%	1%	1%	0%	0%	0%	0%
Fishing	86%	5%	4%	3%	1%	1%	0%

Table 5 shows that there are variety of sports and recreational activities, respectively sports as they are the most popular in our country, Football with a participation of 23% plays once a month, 16% 2-3 times a month, 12 % 1 times a week, 7% 2-3 times a week and 4% 4-5 times a week, a very good% has the game of volleyball and basketball. While with very little percentage are games such as: Golf, skating, bowling, tennis or badminton which showed a very low% in participation in these sports.

Discussion

The purpose of this study was to incest adolescents from the municipality of Drenas aged 17 years, to analyze their body weight, problems of underweight, overweight and obesity, but also to analyze participation in physical activities, games and sports. BMI kg / m in males was 21.0, in females 22.1, the average of both sexes was 21.55 kg / m. Males had lower BMI ($p > 0.05$) 21.55 kg / mL than girls with 22.1 kg / mL. The problem of underweight, overweight and obesity exists in this target age group, although it is not a very high number, it is still among us. The results show that 72% are normal in terms of BMI, 11% are underweight, 12% overweight and 5% obese where a significant difference was observed between obese boys and girls (very overweight) male 3% and female 8 %. Research from (Mustelin 2009) shows that there was a significant connection between physical activity and overweight / obesity in adolescents. Children and adolescents who rarely engage in physical activity and other exercise are more likely to increase obesity compared to teens who exercise and do physical activity regularly. In the same line was also (Muktiharti et al., 2016) where he emphasized that physical activity, games and other physical engagements have an important connection with overweight and obesity. Students who have lower participation on physical activities have potential risk of becoming obese (Huriyati et al., 2004). Low physical activity in adolescents results in a low lifestyle, such as watching television, computer, telephone, using digital games, using motor transport, and activities that require very little physical commitment. (Tremblay et al., 2010). Physical activity through walking and cycling is a very important activity, where it is noticed that 9% of respondents go out once a month to do moderate walking for pleasure and cycling 7% more often than once a month. Water activities participate very little. Studies show that walking and cycling are quite important for improving the cardiovascular and respiratory system, as well as forming a good lifestyle and reducing overweight and obesity (Banwell et al. 2012).

Respondents' answers to the house physical questions were quite satisfactory. It turned out that there was a very high% of weekly and monthly commitments to grass cutting, lawn and garden irrigation, as well as car cleaning and home furnishings, where 8% do household work 6 times a week, 25% 4 -5 times a week while 20% 2-3 times a week. The engagement of the targets in collective and individual sports leaves much to be desired where the engagement of traditional sports such as football, volleyball and basketball has been observed where they show a relatively satisfactory% with 3% realizing games 6 times a week, 3% 4-5 once a week, 8% 2-3 times a week, 17% 1 time a week, 15% 2-3 times a month, 25% 1 time a month, 29% less than 1 time a month. While with very little commitment are games such as: golf, skating, bowling, tennis or badminton with a very low% participation in these sports.

Conclusion

The household activities have brought satisfactory BMI results from targeted students, it shows that their Lifestyle is positive by working in house, while overweight and obesity in some adolescents may have been caused by low level of physical activity and very little activity in household activities.

Recommendations

From the data it has been noticed that there is a lack of professional clubs where young people can engage in various sports, being more engaged and havin better physical results. It is recommended to build modern gyms and open quality sports clubs. There is also a need to conduct research in larger numbers and with specific tests that measure different functional and motor characteristics.

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