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Research article

BODY COMPOSITION, STRUCTURED PHYSICAL ACTIVITY AND NUTRITION QUALITY OF PRESCHOOL CHILDREN ACCORDING TO WEIGHT STATUS

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Abstract. *The aim of this study was to investigate the differences in body composition, involvement in structured PA and nutritional quality habits of normal weight and overweight preschool children from Serbia. Overall, 207 children (5 ± 0.87 year) participated in the study, of which 16 were excluded from the study because of incomplete data. Based on the BMI calculation, the children were divided into two groups: N1=168 normal weight (5.19 ± 0.87 year) and N2=23 overweight children (4.93 ± 0.86 year). There was no statistically significant difference between the observed groups regarding structured PA. Furthermore, no differences in nutritional status were found, underlying the importance of parents promoting good nutritional habits to their children. The preschool age provides a good opportunity for children to develop healthy eating habits in order to maintain healthy growth and development. Nutritional status monitoring in children, along with adequate physical activity, represent good preventive measures against obesity in a population. Developing and maintaining good overall lifestyle habits at this age could prevent development of some modern diseases at later stages in life.*

Key words: *NutriStep, BMI, Obesity, Physical Activity.*

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1. INTRODUCTION

Good health status, particularly in preschool children became a point of interest of many researchers world-wide, as the prevalence of overweight and obesity emerged as one of the urgent and up-rising health problems of the modern age (Drid et al., 2013; Ostojic et al., 2014; Ng, 2014). Health problems were recognized as a product of an increase in physical inactivity due to a sedentary lifestyle along with increased caloric intake and lower consumption of fruits and vegetables. Childhood obesity is associated with risk factors for later heart diseases and chronic diseases (Berenson et al., 2016), that may operate through the association between child and adult obesity (Skinner et al., 2015). Hence, the trends in child obesity should be closely monitored for its public health importance. Early childhood represents an opportunity for lifestyle interventions, as this is a critical life-stage at which children accumulate knowledge and skills around behaviors such as eating and physical activity (Wiseman et al., 2016).

The available data show that worldwide obesity has nearly tripled since 1975 (WHO, 2017), more precisely, nearly 41 million children under the age of 5 were overweight or obese in 2016. Predictions made by Lobstein and Jackson-Leach (2016) about obesity and comorbidities in school-age children in 2025 show devastating numbers, if this trend should continue. Their estimation shows increasing trends from 2010 to 2025 for global overweight prevalence in children aged 5-17 that will rise from 13.9% to 15.8%, whereas obesity alone will rise from 4.8% (76 million children) to 5.4% (91 million children). In Serbia, as one of the East European countries, the estimated population is somewhat over 7 million people, of which 56.3% of the adult population is overweight with 21.2% of them obese (Public Health Institute Serbia, 2014). To the best of our knowledge, there is only one study examining the prevalence of overweight and obesity in Serbian preschoolers 6-7 years old (Stojanovic & Belojevic, 2009) which reported 6.3% of boys and 3.8% of girls to be obese in the urban areas of South-East Serbia. Another survey reported a 13.9% prevalence of obesity in Serbian children 0-5 years old in 2014 (MICS, 2014).

Healthy eating habits and nutrition quality are essential for the normal growth and development of preschool children, as well as for preventing nutrition-related diseases later in life (Carrie et al., 2005).

The Body mass index (BMI) is one of the most common Somatic Indexes widely used in describing the weight status of children (Drid et al., 2013). Prevalence varies by region, sex, age, social position and cut-offs used. However, there is an ongoing debate about the limitations of BMI as a measure of adiposity in children, but there are also several publications that show the usefulness of this anthropometric parameter and its high correlation with other measures of adiposity (Pietrobelli et al., 1998; Mei et al., 2002).

Physical activity (PA) plays an important role in helping a child to stay fit and healthy throughout his/her lifespan. Physical activity is the most important means of improving children's health (Jin et al., 2018). Appropriately applied PA helps children have a healthy weight, achieve strong bones and muscles, improve their posture, develop cardiovascular fitness and maintain blood pressure, cholesterol and insulin sensitivity (recognized as risk factors for coronary heart disease and type 2 diabetes in adults) as well as enhance their self-esteem and build social skills. Pate & O'Neill (2012) emphasize that the recommendations from health organizations regarding the guidelines for the type and the amount of PA for preschool children differ. However, they all agree and recommend about 3 hours of total PA per day for children 3 to 5 years old. Nevertheless, there is a lack of research in preschool children regarding nutritional status and PA.

Based on the above mentioned, the aim of this study was to investigate the differences in body composition, involvement in structured PA and nutritional quality habits of normal and overweight preschool children.

2. METHODS

2.1. Participants

The evaluation took place between September and November 2017 with stratified (geographically) random sampling which was used in this cross-sectional study. Five state kindergartens were selected on a proportional basis, with 15-30% of each respective kindergarten age group being sampled. Around 90% of the children in Subotica attend preschool. The head principal of the kindergartens was contacted, and the aims of the study explained to both the kindergarten nurses and educators, as well as school administrators. Once a kindergarten had agreed to participate in the study, letters to parents were distributed. All participants and parents were fully informed verbally and in writing about the nature and demands of the study. All of the participants and parents gave their informed consent and volunteered to participate in the study with the approval of the College's Ethical Advisory Commission in accordance with the Declaration of Helsinki. The parents were informed that they could withdraw a child from the study at any time, even after giving their written consent. Overall, 207 children (5 ± 0.87 year) participated in the study, of which 16 were excluded from the study because of incomplete data. Based on the BMI calculation (Cole et al., 2000) that all children over the 0.91 percentile are considered to be overweight – the children were divided into two groups: N1=168 normal weight (5.19 ± 0.87 year) and N2=23 overweight children (4.93 ± 0.86 year). The survey on child nutrition was filled out by the parents (in 75% of cases by the mother).

2.2. Experimental design

Each child underwent a one-day testing session, where anthropometric assessment was carried out. Height was measured using a mobile stadiometer (Model 202, Seca, Birmingham, UK) to the nearest 0.1 cm, while body mass was obtained to the nearest 0.1 kg using a bioelectric impedance analysis InBody230 (Biospace Co., Ltd, Corea). The participants were measured in private by experts of the respective gender, in their underwear only, and in the same state of hydration and nourishment after voiding. All anthropometric measurements were taken between 9 and 11 a.m. after an overnight fast of between 10 and 12 h. BMI was calculated as weight (kg)/height $(m)^2$. Skinfold thickness at three sites (abdominal, subscapular and triceps) were obtained using a Harpenden caliper (British Indicators Ltd., St. Albans, UK). The landmarks were identified and measured according to Wilmore & Behnke (1969), with the median of three measurements used to represent skinfold thickness (Cronbach's α=0.99). The experimental design was approved by institutional Ethics committee.

2.3. Body composition

Body composition was assessed with a bioelectric impedance analysis InBody230 (Biospace Co., Ltd, Corea), where muscle mass, body fat and body fat% were obtained. Measurements were carried out through a given protocol for children by the manufacturer with a frequency of 50 kHz.

2.4. Nutritional questionnaire and sports recreational involvement of children

Nutritional habits were estimated through a standardized Nutrition screening tool for preschoolers - the NutriStep® questionnaire (Ontario, Canada), with previously confirmed reliability of the screening tool (Simpson et al., 2017). Nutrition risk screening through a valid and reliable 17-item questionnaire is the process of identifying factors known to be associated with dietary or nutritional issues. The purpose of nutrition risk screening is to identify issues before they become serious or cannot be reversed and to refer those at risk to appropriate tests and treatment. The NutriStep® questionnaire provides early identification of potential nutrition issues and attributes to food and fluid intake, physical growth and development, factors affecting food intake and eating behaviors as well as physical activity and sedentary behavior. For each template, the coding for each response on the questionnaire was provided within a spreadsheet, where the overall score <20 is classified as low risk and Rank 1; scores 21-25 were classified as medium risk and Rank2; and scores >26 were classified as high risk and Rank 3. Moreover, parents were asked if the children were involved in structured PA. They had to answer simply with a yes or no.

2.5. Statistical Analysis

All data are presented as mean values and standard deviations. From descriptive statistics, for each variable, measures of central tendency (arithmetic mean) dispersion (standard deviation), minimum, maximum and standard error were calculated. For comparative statistics, the T test for independent samples was used for parametric data analysis, and the Mann-Whitney test was applied for nonparametric variables. The level of significance was set at $p \leq 0.05$.

3. RESULTS

Table 1 shows the results of the body composition for normal weight and overweight children. There is a statistically significant difference found in all observed variables. On average, overweight children have nearly 5 kg in body weight more than their peers. Furthermore, the differences in the average values for body fat between the observed groups is around 3.5 kg, and for muscle mass only 1 kg in favor of the overweight group of children. The greatest difference in the average values for skin folds is observed for the abdomen.

Table 1 Results for body composition of obtained groups according to weight status

	Normal weight (n=168)			Overweight (n=23)			
	Mean ± SD	Min	Max	Mean ± SD	Min	Max	p
Body weight (kg)	19.63 ± 2.86	14.1	29.1	24.96 ± 3.46	19.1	31.2	0.00
Abdominal skinfold (mm)	7.79 ± 3.05	3.87	18.80	16.21 ± 4.65	6.47	26.13	0.00
Subscapular skinfold (mm)	5.62 ± 1.21	3.60	9.40	9.82 ± 2.75	6.00	17.33	0.00
Triceps skinfold (mm)	8.62 ± 2.02	5.20	14.27	12.93 ± 2.80	7.00	19.80	0.00
Muscle mass (kg)	7.35 ± 1.47	4.1	11.9	8.45 ± 1.79	5.7	11.5	0.00
Body fat (kg)	3.79 ± 1.14	1.4	7.3	7.31 ± 1.41	5.3	10.0	0.00
Body fat (%)	19.29 ± 5.01	8.2	32.0	29.46 ± 4.99	20.3	40.2	0.00

The results for the involvement of children in structured activities are presented in Table 2. There was no statistically significant difference between the observed groups regarding structured PA. Normal and overweight children were equally included in some kind of structured activities.

Table 2 Results for involvement in sports-recreational activities for groups according to weight status

	Normal weight (n=168)	Overweight (n=23)	p
Included in structured PA	124 (73.8%)	17 (73.9%)	0.99*
Not included in structured PA	44 (26.2%)	6 (26.1%)	

*Z= -.011

The overall results of the nutrition quality in preschool children, assessed through the NutriStep® questionnaire, showed no statistically significant difference between formed groups of participants (Table 3). Furthermore, the Mann-Whitney test showed no differences between ranks as well. More than 50% of normal weight children were in Rank 1, but the distribution of the results in the Ranks was significantly more equal in the group of overweight children.

Table 3 NutriStep® results for groups according to weight status

NutriStep® Rank	Normal weight (n=168)	Overweight (n=23)	p
Rank 1	90 (53.3%)	9 (39.1%)	
Rank 2	50 (29.6%)	7 (30.4%)	0.13*
Rank 3	29 (17.2%)	7 (30.4%)	
Total Score	20.33 (±5.36)	21.52 (±6.83)	0.33**

*Z= -1.528
**t= -.971

4. DISCUSSION

The presented study observed body composition, the level of PA and nutritional status in preschool children from Subotica, Serbia. From the results obtained, 12.04% (N=23) of the participants were found to be overweight from the overall number of participants (N=191). Some other studies also noted excessive weight and obesity in pre-school children (De Onis et al., 2010; Martorell et al., 2000; Biehl et al., 2013), confirming the sternness of this rising problem at this age. An increased number of overweight or obese people due to increased intake of saturated fats, free sugars, refined foods and alcohol, followed by changes in physical activity and stress level, represents a trend in modern and developing societies (Popkin, 1994). As the society makes progress and develops, it seems that this frontier of being overweight and obese is brought closer to a younger population. So far it has been confirmed that children look up to the elderly in their surroundings, and a few studies have already confirmed the parental and environmental influence on children's eating habits (Sigman-Grant et al., 2013; Zarnowiecki et al., 2011)

Body composition in its structure includes skeletal muscle, fatty tissue (subcutaneous fat tissue and visceral tissue), bone tissue, visceral organs and the brain. There are numerous factors that could contribute to a change in body composition, such as genetics, environmental factors, energy consumption, etc., (Kopelman, 2000). However, it is assumed that overweight or obesity

are more often caused by a combination of different factors. Evaluating body fat and muscle mass in overweight and normal weight preschool children in this study, a statistically significant difference was found in all the observed body composition variables in favor of the normal weight group of children. The differences obtained in the results were expected, given that groups were formed according to the body mass index based on the recommendations made by Cole et al. (2000).

Significant factors of obesity often include nutritional habits (nutritional adequacy, food portions, and food quality) and PA. By monitoring the dietary habits of children, the authors tried to determine the differences between overweight and normal weight children. Based on the results obtained, it can be noticed that there are no statistically significant differences in nutritional status in preschool children according to their weight status. At this age parents have a unique role in promoting healthy behaviors to their children (Jaballas et al., 2011), and parents were the ones answering the nutritional questionnaire. Furthermore, the lack of differences between groups could be justified with a very small sample size of overweight children. However, when observing percentage values, it can be noticed that a significantly higher percentage of normal weight children belong to Rank 1 (low nutritional issues risk), whereas a significantly higher percentage of overweight children belong to Rank 3 (high nutritional issues risk). Several studies (Lamb and Ogden, 2015; Nalty et al., 2013) similarly found no association between obesity and food insecurity among preschool children, justifying this finding with more direct parental knowledge of good nutritional habits in younger children compared to older children. Overall, the obtained results on current dietary behaviors and practices of preschool children from Subotica could be evaluated as having a satisfactory nutritional level.

Monitoring physical activity with adequate measuring instruments is of a high importance for obtaining valid information. Present research did not monitor physical activity directly; however, based on the questionnaire, information was obtained on how many children are attending structured physical activity in their spare time. The data confirmed no statistically significant difference between the formed groups of participants, whereas very similar percentage values were reported. About 74% of the children are involved in structured PA in their spare time. Structured PA of children positively reflects on their health status, in addition to children's learning about sports skills, which is very important for leading them to a certain sport discipline later. The data on the inclusion of children in structured physical activity was not sufficient enough to find out what the overall child's PA was during the day.

Limitations of the present study that must be taken into consideration include the fact that the observed groups of children were uneven in numbers. In addition, no direct measurement of the level of PA among children was performed. Additional research is needed to include a larger uniform pattern of groups of children by levels of nutrition, as well as direct measurement of the level of PA of children of this age with an accelerometer or a pedometer. Furthermore, a longitudinal study with more measures of developmental status, body composition, nutritional habits as well as the level and structure of PA could give more substantial evidence regarding weight status in preschool children.

5. CONCLUSION

Differences in body composition between normal weight and overweight preschool children were found. However, there were no differences regarding the level of structured PA. Furthermore, no differences in nutritional status were found, underlying the importance of

parents promoting of good nutritional habits to their children. The preschool age represents a good opportunity for children to develop healthy eating habits in order to maintain healthy growth and development. A monitored nutrition status in children, along with adequate physical activity, represents good preventive measures against obesity in a population. Developing and maintaining good overall lifestyle habits at this age could prevent the development of some modern diseases at later stages of life.

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REFERENCES

Active Healthy Kids Canada. Are we driving our kids to unhealthy habits? The 2013 Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth. Toronto: Active Healthy Kids Canada; 2013.

Berenson, G. S., Srinivasan, S. R., Xu, J. H., & Chen, W. (2016). Adiposity and cardiovascular risk factor variables in childhood are associated with premature death from coronary heart disease in adults: the Bogalusa Heart Study. *The American journal of the medical sciences*, *352*(5), 448-454.

Biehl, A., Hovengen, R., Groholt, E. K., Hjelmesaeth, J., Strand, B. H., & Meyer, H. E. (2013). Adiposity among children in Norway by urbanity and maternal education: a nationally representative study. BMC Public Health,13,842-50. doi: 10.1186/1471- 2458-13-842.

Carrie, F., Keller, L., Olson, J., & Plymale, A. (2005). Helping preschoolers become healthy eaters. *Journal of Pediatric Health Care*, *19*(3), 178-182.

Cole, T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *British Medical Journal*, *320*(7244), 1240.

Committee on Sports Medicine and Fitness, & Committee on School Health. (2001). Organized sports for children and preadolescents. *Pediatrics*, *107*(6), 1459-1462.

De Onis, M., Blössner, M., & Borghi, E. (2010). Global prevalence and trends of overweight and obesity among preschool children free. *The American journal of clinical nutrition*, *92*(5), 1257-1264.

Drid, P., Vujkov, S., Jakšić, D., Trivić, T., Marinković, D., & Bala, G. (2013). Differences in motor and cognitive abilities of children depending on their body mass index and subcutaneous adipose tissue. *Collegium antropologicum*, *37*(2), 171-177.

Institut za javno zdravlje Srbije "Dr Milan Jovanović Batut. (2014). Rezultati istraživanja zdravlja stanovništva Srbije, 2013.godine. Beograd: Institut za javno zdravlje Srbije "Dr Milan Jovanović Batut".

Jaballas, E., Clark-Ott, D., Clasen, C., Stolfi, A., & Urban, M. (2011). Parents' perceptions of their children's weight, eating habits, and physical activities at home and at school. *Journal of Pediatric Health Care*, *25*(5), 294-301.

Jin, J., Yun, J., & Agiovlasitis, S. (2018). Impact of enjoyment on physical activity and health among children with disabilities in schools. *Disability and health journal*, *11*(1), 14-19.

Kaur, J., Lamb, M. M., & Ogden, C. L. (2015). The association between food insecurity and obesity in children—The National Health and Nutrition Examination Survey. *Journal of the Academy of Nutrition and Dietetics*, *115*(5), 751-758.

Kopelman, P. G. (2000). Obesity as a medical problem. *Nature*, *404*(6778), 635.

Lobstein, T., & Jackson-Leach, R. (2016). Planning for the worst: estimates of obesity and comorbidities in school-age children in 2025. *Pediatric obesity*, *11*(5), 321-325.

Martorell, R., Khan, L. K., Hughes, M. L., & Grummer-Strawn, L. M. (2000). Overweight and obesity in preschool children from developing countries. *International journal of obesity*, *24*(8), 959.

Mei, Z., Grummer-Strawn, L.M., Pietrobelli, A., Goulding, A., Goran, M.I., Dietz, W.H. (2002). Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescents. *The American Journal of Clinical Nutrition, 75*(6), 978–985.

Nalty, C.C., Sharkey, J.R., Dean, W.R. (2013). Children's reporting of food insecurity in predominately food insecure households in Texas border colonias. *Nutritional Journal., 12*(1), 15.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., ... & Abraham, J. P. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The lancet*, *384*(9945), 766-781.

Ostojic, S. M., Stojanovic, M. D., Milosevic, Z., Jorga, J., & Grujic, S. (2014). Prevalence of Obesity and Association between Body Fatness and Aerobic Fitness in Serbian Preschool Children. *Obesity Epidemic*, 53-66.

Pate, R.R., O'Neill, J.R. (2012). Physical activity guidelines for young children: An emerging consensus. *Archives of Pediatrics & Adolescent Medicine*; *166*(12), 1095–1096.

Pietrobelli, A., Faith, M.S., Allison, D.B., Gallagher, D., Chiumello, G., Heymsfield, S.B. (1998). Body mass index as a measure of adiposity among children and adolescents: a validation study. *The Journal of Pediatrics*; *132*(2), 204–210.

Popkin, B. M. (1994). The nutrition transition in low-income countries: an emerging crisis. *Nutrition reviews*, *52*(9), 285-298.

Sigman-Grant, M., Byington, T.A., Lindsay, A.R., et al. (2013). Preschoolers can distinguish between healthy and unhealthy foods: The all 4 kids study. *Journal of Nutrition Education and Behavior 46*(2), 121–127.

Simpson, R.J., Boere, M., Dwyer, J., Haresign, H., Beyers, J., Darlington, G., & Haines, J. (2017). Efficacy of nutrition risk screening with NutriSTEP® among toddlers and preschoolers. *Appl Physiol Nutr Metab* 2017;42:S44

Skinner, A. C., Perrin, E. M., Moss, L. A., & Skelton, J. A. (2015). Cardio-metabolic risks and severity of obesity in children and young adults. *New England Journal of Medicine*, *373*(14), 1307-1317.

Statistical Office of the Republic of Serbia and UNICEF 2014 Serbia Multiple Indicator Cluster Survey and 2014 Serbia Roma Settlements Multiple Indicator Cluster Survey (MICS). Key Findings. Belgrade, Serbia: Statistical Office of the Republic of Serbia and UNICEF (2014).

Stojanovic, D., & Belojevic, G. (2009). Prevalence of obesity among children aged 6–7 years in South-East Serbia. *Obesity reviews*, *10*(3), 262-264.

Wilmore, J.H., & Behnke, A.R. (1969). An anthropometric estimation of body density and lean body weight in young men. *Journal of Applied Physiology*, *27*(1), 25-31.

Wiseman, N., Harris, N., & Lee, P. (2016). Lifestyle knowledge and preferences in preschool children: Evaluation of the Get up and Grow healthy lifestyle education programme. *Health Education Journal*, *75*(8), 1012-1024

World Health Organization. (2017). Tenfold increase in childhood and adolescent obesity in four decades: new study by Imperial College London and WHO. *Saudi Medical Journal*, *38*(11), 1162-1163.

Zarnowiecki, D., Dollman, J. and Sin, N. (2011). A tool for assessing healthy food knowledge in 5-6-year-old Australian children. *Public Health Nutrition 14*(7), 1177–1183.

TELESNA KOMPOZICIJA, STRUKTURIRANA FIZIČKA AKTIVNOST I KVALITET ISHRANE U ODNOSU NA TEŽINSKI STATUS PREDŠKOLSKE DECE

Cilj ovog istraživanja bio je da se ispitaju razlike u telesnoj kompoziciji, uključenosti dece u strukturiranu fizičku aktivnost (FA), kao i kvalitet ishrane dece predškolskog uzrasta sa normalnom i prekomernom telesnom težinom sa područja Srbije. U istraživanju je učestvovalo ukupno 207 dece (5 ± 0,87 godina), od kojih je 16 isključeno iz studije zbog nepotpunih podataka. Na osnovu izračunatog ITM (indeksa telesne mase), deca su podeljena u dve grupe: N1=168 normalne težine (5,19 ± 0,87 godina) i N2=23 dece sa prekomernom telesnom težinom (4,93 ± 0,86 godina). Nisu pronađene statistički značajne razlike između posmatranih grupa u pogledu strukturirane FA, ni razlike u statusu uhranjenosti posmatrane dece, što ukazuje na važnost roditelja i promocije dobrih prehrambenih navika svojoj deci. Predškolski uzrast pruža dobru priliku deci da steknu zdrave navike u ishrani kako bi održali zdrav rast i razvoj. Praćenje nutritivnog statusa kod dece, uz adekvatnu fizičku aktivnost, predstavljaju dobre preventivne mere protiv gojaznosti u populaciji. Razvijanje i održavanje dobrih opštih životnih navika u ovom uzrastu može sprečiti razvoj nekih savremenih bolesti u kasnijim fazama života.

Ključne reči: *NutriStep anketa, ITM, gojaznost, fizička aktivnost*.