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**PRIMARY SCHOOL PUPILS' SELF-CONCEPT IN THE  
CONTEXT OF THEIR BODY MASS INDEX**

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*Abstract*

The level of school maturity is a deciding factor in the child's qualification for the start of compulsory school attendance. If dispositions developed by the learning process and social environment are added to this attribute, we can talk about school readiness. School readiness comprises factors related to the level of child's self-concept, which includes intellect, popularity in class, freedom from anxiety, feelings of happiness and satisfaction as well as physical appearance and attributes. The aim of this study is to analyse the relationship between the level of body mass index and self-concept of pupils in primary education. The research group consisted of 300 pupils (149 boys, 151 girls) at middle school age (9 – 11 years). 3 subgroups were created based on weight according to age and gender: underweight children, children with normal weight and overweight or obese children (Cole, Bellizzi, Flegal, Dietz, 2000). The area of self-concept factors was measured using the Piers-Harris questionnaire (Piers & Herzberg, 2009). It was assumed that the overweight and obese sample would display a tendency for low self-confidence. Gender differences were, however, found in the level of self-concept ( $U=9492.50$ ;  $p=0.02$ ). There was relationship between children's weight and self-concept. This topic is important as with this knowledge, support programs and intervention projects can be created dealing with self-concept issues even at pre-school and primary levels.

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**Keywords:** Children, self-concept, compulsory school attendance, overweight and obesity



## 1. Introduction

Children's education related to a healthy life-style is an important part of education, which serves as prevention against diseases, which arise as result of excess weight or obesity. The decrease in natural and vigorous physical activity and increase in inappropriate diet are mentioned in several studies (Department of Health and Children and the Health Service Executive, 2008; Kodat, Sobota, Kebza, Biganovský & Amortová, 2006; WHO, 2011) as causes for the subsequent increase in many diseases like juvenile diabetes, stroke, and cancer. Research in this area have postulated other determinants in connection with children's weight increase and decrease of physical activity, which include parents' level of education and job, type and locality of child's home, safety of environment, actual health status and level of physical fitness (Arredondo, Elder, Avala, Campbell, Baquero, & Duerksen, 2006; Kuo, Voorhees, Haythornthwaite, & Young, 2007; Resnick, Bishop, O'Connel, Hugo, Timm, Ozonoff, & Geller, 2009).

The problems of increased weight and obesity on children's psychosocial health has been gaining importance in the last few years. Specialists have highlighted the connection between excess weight and obesity, low physical fitness and consequent problems with social acceptance among peers (Zeller, Reiter-Purtill, & Ramey, 2008; Biddle & Asare, 2011). Interaction with peers is an important factor related to the adoption of important social skills (cooperation, positive rivalry, understanding social rules of social-group). There is research that indicates that the level of motor skills correlate with the ability of adaptation and social competencies (Arbesman, Bazyk, Nochajski, 2013; Diamont, 2007; Cho, Ji, Chung, Kim, & Joung, 2014). Obese children have been found to have low levels of mastered motor skills, and are, hence, rejected by peers (Brown, Pearson, Braithwaite, et al., 2013; Matějček, 2004).

The inability to successfully participate on common physical tasks consequently negatively affects the process of adaptation in school-class competencies (Schulz & Northridge, 2004; Pica, 2004). The deficit in this area can cause the gradual decrease of the child's activity and further retard social and emotional development. All this is consequently affects the child's level of peer acceptance in school/class (Fedewa & Ahn, 2011; Smith et al., 2013; American Occupational Therapy Association, 2014). Problems of social acceptance have a negative impact on the child's self-confidence, level of working capacity, ability to make friends and so on. Problems mentioned in literature include increased risk of depression, social rejection by peers, lower social participation or psychosomatic troubles (Griffiths, Parsons, & Hill, 2010; Barnett, O'Loughlin, Gauvin, Paradis & Hanley, 2006; Oliver, Schofield, & Kolt, 2007; Kornilaki, 2014). Researchers have identified found relationships between the child's cognitive skills, academic achievements and physical activity (Efrat, 2011; Smith, Hoza, Linnea, McQuade, Tom, & Vaughn, 2013).

The process of individual adaptation and adaptive behaviour is connected to some personal characteristics of individuals such as self-concept, anxiety level of frustration and emotional stability. The child's communicative skills, intellect and autoregulation are also mentioned as relating to the child's adaptation processes (Altermatt, Pomerantz, Ruble, Frey & Greulich, 2002; Homer & Tamis-LeMonda, 2005; Wild & Möller, 2009; Jenni, Chaouc, Caflisch & Rousson, 2013).

## 2. Problem Statement

Increased body weight (excess weight or obesity) of children can have a detrimental effect on their social development resulting in problems in interpersonal relationships, inclusion in social groups and so on. Among the negative effects as identified by specialists in this area are low self-confidence and self-concept. This research is therefore aimed at analysing the relationship between the child's weight and self-concept. It is assumed that over-weight and obese pupils will display a lower level of self-concept than pupils with normal weight status. Another purpose of this study is to examine the relationship between girls' and boys' self-concept. An examination of the effect of increased weight on children's self-concept and adaptability in school-classes could help to explain some documented behavioural changes in population (Efrat, 2011; Smith, Hoza, Linnea, McQuade, Tom, & Vaughn, 2013).

## 3. Research Questions

In line with the discussion, the research questions will attempt to identify:

*3.1 a relationship between the level of self-concept and increased weight in children from lower levels of primary schools.*

*3.2 any differences in level of self-concept between genders.*

## 4. Purpose of the Study

The purpose of this study is to identify differences in self-concept between children with normal weight status and children classified as over-weight or obese from the paediatric perspective. Another aim is identify possible differences in self-concept in the context of gender.

## 5. Research Methods

### 5.1. Research group

The research sample comprised 300 pupils from lower levels of primary schools (151 girls, 149 boys) from one region in the Czech Republic. The average age of the sample was  $9.90 \pm 1.03$  years (girls  $9.67 \pm 1.00$ , boys  $9.71 \pm 1.05$ ). The height, weight and body mass index (BMI) of the sample was assessed according to international norms (Cole, Belilizzi, Flegal, Dietz, 2000), and the age and gender was taken into account. Based on this data, 3 sub-sets were created: 1<sup>st</sup> sub-set with low weight status, 2<sup>nd</sup> sub-set was normal weight status and 3<sup>rd</sup> sub-set was over-weight and obese (see Table 01.). No child in this sample was physically or mentally handicapped. The table below shows that only 6% of children were classified as obese or over-weight. Low weight status was found only in 16% of children.

**Table 01.** Research sample according to BMI, n=300

Category of BMI	All	Girls	Boys
1	49	25	24
2	232	113	119
3	19	10	9

The level of self-concept was measured using the Piers-Harris Children's Self-Concept Scale 2 questionnaire (Piers, Harris, & Herzberg, 2009). The scores converted according to T-scores. Based on T-scores, the sample was classified into categories: Category I = above average range ( $\geq 56T$ ), Category II = average range (40–55T) and Category III = low range ( $\leq 39T$ ). If very poor scores ( $\leq 29T$ ) were detected, it was presumed that the child has a diagnosable psychic disorder (Table 02.) and–examination by a specialist/doctor was recommended. This group was categorised as Category IV.

**Table 02.** Research sample according to Self-concept, n=300

Category of self-concept	All	Girls	Boys
I	9	3	6
II	213	97	116
III	64	41	23
IV	14	7	7

Table 02 above shows frequency of children in Self-concept categories.

This research was conducted between May to June 2017 in primary schools in one region in the Czech Republic. Before the research commenced, the agreement of Ethical Committee of Pedagogical Faculty, Palacky University in Olomouc (N 03/17) was obtained. As the children were very young, written agreement of children's legal representatives was necessary. All persons connected with the research were introduced to the research aims before the research started. All queries were answered. Anonymity of collected data was declared in written form according to Czech Republic legislation. The participation in the research was voluntary, without reward and no benefits for participants. The participants could leave or stop their participation in the research. Data were collected as a part of the IGA\_PdF\_2017\_002 project.

Basic statistical data about research sample as in number of girls and boys; average age; categories of BMI) were expressed by average number, standard derivation number and frequency of persons in each category.

The relationship between self-concept and sample's BMI category was found by  $\chi^2$ . For gender differences in self-concept according to BMI category, the Mann Whitney test was used. The level of significant importance was established as  $p < 0.05$ . The data were processed using STATISTICA, version 12.0 software (StatSoft).

## 6. Findings

The excess weight (over-weight and obesity) group did not display a high level of self-concept. The majority of the sample 78.95% (36.84% girls; 42.11% boys) were found in the high T-score self-concept category. Only 15.79% of the excess weight children (15.79% girls; 0% boys) were in the low self-concept range. There was only 5.26 % boys (no girls) with low self-concept score from this sub-set. The majority of children in this sample (68.97%) who were in Category II = high self-concept (30.60% girls; 38.36% boys) were of the normal weight category. 21.98% of the children (14.22% girls; 7.76% boys) were in the low self-concept range. Only 3.45% (0.86 % girls, 2.59 % boys) displayed a high level

of self-concept. There was a fairly high representation of children (5.60%) with normal weight in Category IV. = very poor level of self-concept (3.02% girls; 2.59% boys). However, the children with low self-concept were not found in the low weight group. Those children showed an above average range (77.55 %), and the results were the same for boys and girls (38.78 %). Low self-concept was found in this group in 20.41 % of children, also with the same results for boys and girls (10.20 %). Only one girl from the low weight category had a high level of self-concept (2%) (see Table 03.).

**Table 03.** Frequency of sample according to self-concept in context of BMI, n=300

BMI	Category I.			Category II.			Category III.			Category IV.		
	All	Girls	Boys	All	Girls	Boys	All	Girls	Boys	All	Girls	Boys
1	1	1	0	38	19	19	10	5	5	0	0	0
2	8	2	6	160	71	89	51	33	18	13	7	6
3	0	0	0	15	7	8	3	3	0	1	0	1

In terms of gender, the Mann Whitney U test confirmed the premise that BMI of girls (Mdn=151) and boys (Mdn=149) in early school age is similar ( $U=10590.50$ ;  $p=0.63$ ). Gender differences were, however, found in the level of self-concept ( $U=9492.50$ ;  $p=0.02$ ). Based on statistics, there was no relationship between children's weight and self-concept ( $\chi^2 = 5.87$   $df = 3$   $p = 0.12$ ). In early school age, research has shown that overweight or obese children could have similar results as their normal weight peers and they can also have better cognitive skills (Li, Dai, Jackson a Zhang, 2008; Wake et al., 2013; Pearce, Scalzia, Lynchac & Smithers, 2016). Similar results in this age category were also found by Strauss (2000), who however, highlights evidence of decreasing self-concept in obese children as they grow older. Those children more often smoke and drink alcohol excessively. Other research confirms that this problem increases with age. Serassuelo, Cavazzotto, Paludo, Zambrin and Simões (2014) used the same research tool (Piers-Harris Children's Self-Concept Scale 2) to examine children's self-concept and obesity and they confirmed the relationship between obesity and self-concept in monitored persons. Some authors (Griffiths, Parsons, & Hill, 2010; Ahn & Fedewa, 2011) found a higher probability of misbehaviour in interpersonal relationships with peers in five-year-old obese boys. Based on this, authors propose that negative effects of higher body weight in socio-emotional areas should be examined separately in overweight and obese children and those who are not.

## 7. Conclusion

The negative effects of excess weight and obesity are serious in children's psychosocial development. Although such negative effects are not apparent in young children, they are certainly shown in older age categories (Gest, 1997; Pichler, 2008; WHO, 2011). Compulsory school attendance can play a vital role in the development of children's self-concept. WHO (2011) recommends 60 minutes of physical activity per day for children, covered in physical education classes, active transportation to school, supplementary organized physical activities, and so on. The positive effect of quality physical education has been confirmed in many studies (Jansen, Raat, van Zwanenburg, Reuvers, van Walsem & Brug, 2008; Kubesch, Walk, Spitzer, Kammer, Lainburg, Heim, R. et al., 2009; Kriemler et al., 2010;

Guinhouya, Lemdani, Vilhelm, Hubert, Apete, & Durocher, 2009; Physical Activity and Physical Education in California Schools, 2009). This research was limited by a low sample number and constraint in location. Hence a low number of pupils were monitored in terms of pediatric overweight and obesity. Early recognition of and response to this problem should be the aim of prevention realized in institutions like schools and/or health facilities. Psychosocial risks of increased weight (especially obesity) in children are high and because of that, it is necessary that ~~to aim~~ further research be conducted on this age group to and support creation of preventive and intervention programs.

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## References

- Ahn, S. & Fedewa, S. L. (2011). A meta-analysis of the relationship between children's physical activity and mental health. *Journal of Pediatric Psychology*, 36, 385-397.
- Arbesman, M., Bazyk, S., & Nochajski, S. M. (2013). Systematic review of occupational therapy and mental health promotion, prevention, and intervention for children and youth. *American Journal of Occupational Therapy*, 67, 120-130.
- American Occupational Therapy Association. (2014). Research opportunities in the area of mental health promotion, prevention, and intervention for children and youth. *American Journal of Occupational Therapy*, 68, 610-612.
- Arredondo, E. M., Elder, J., Avala, G. X., Campbell, N., Baquero, B., & Duerksen, S. (2006). Is parenting style related to children's healthy eating and physical activity in Latino families? *Health Education Research*, 21(6), 862-871.
- Barnett, T. A., O'Loughlin, J., Gauvin, L., Paradis, G., & Hanley, J. (2006). Opportunities for student physical activity in elementary schools: A cross sectional survey of frequency and correlates. *Health Education & Behavior*, 33(2), 215-232.
- Biddle, S. J. H. & Asare, M. (2011). Physical activity and mental health in children and adolescents: a review of reviews. *British Journal of Sports Medicine*, 45(11), 886-95.
- Brown, H. E., Pearson, N., Braithwaite, R. E., Brown, B. J. & Biddle, S. J. H. (2013). *Sports Medicine*, 43, 195-206. doi:10.1007/s40279-012-0015-8
- 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, 1240-1243. doi:10.1136/bmj.320.7244.1240
- Health Service Executive and Department of Health and Children (2008). *National Strategy for Service User Involvement in the Irish Health Services 2008-2013*. Dublin: Department of Health and Children and the Health Service Executive.
- Efrat, M. (2011). The relationship between low-income and minority children's physical activity and academic-related outcomes: a review of the literature. *Health Education & Behavior*, 38, 441-451.
- Fedewa, A. L. & Ahn, S. (2011) The effects of physical activity and physical fitness on children's achievement and cognitive outcomes: A meta-analysis. *Research Quarterly for Exercise and Ahn*
- Griffiths, L. J., Parsons, T. J. & Hill, A. J. (2010), Self-esteem and quality of life in obese children and adolescents: A systematic review. *International Journal of Paediatric Obesity*, 5(4), 282-304. doi:10.3109/17477160903473697.
- Guinhouya, B. C., Lemdani, M., Vilhelm, C., Hubert, H., Apete, G. K., & Durocher, A. (2009). How school time physical activity is the "big one" for daily activity among schoolchildren: a semi-experimental approach. *Journal of Physical Activity and Health*, 6, 510-519.

- Cho, H., Ji, S., Chung, S., Kim, M., & Joung Y. S. (2014). Motor Function in School-Aged Children with Attention-Deficit/Hyperactivity Disorder in Korea. *Psychiatry Investigation*, *11*(3), 223-227.
- Jansen, W., Raat, H., Van Zwanenburg, J. E., Reuvers, I., Van Walsem, R. & Brug, J. A. (2008). A school based intervention to reduce overweight and inactivity in children aged 6–12 years: Study design of a randomized controlled trial. *PMC Public Health*, *8*(1), 257.
- Jenni, O. G., Chaouch, A., Cafilisch, J., Rousson, V. (2013). Correlations between motor and intellectual functions in normally developing children between 7 and 18 years. *Developmental Neuropsychology*, *38*(2), 98-113.
- Kodat, V., Sobota, J., Kebza, V., Biganovský, M., & Amortová, R. (2006). Correlations of somatophysiological, biochemical, psychosocial and behavioural risk factors of cardiovascular diseases in a sample of employees of Prague enterprises and institutions. *Central European Journal of PublicHealth*, *13*(4), 191-199.
- Kornilaki, E. N. (2014). The effect of body-weight and obesity bias on children's self-esteem. *Preschool and Primary Education*, [S.l.], *3*(1), 3-16, Nov. 2014. ISSN 2241-7206. Available at: <<https://ejournals.epublishing.ekt.gr/index.php/education/article/view/1894>>. Date accessed: 14 July 2017. doi:<http://dx.doi.org/10.12681/ppej.137>.
- Kriemler, S., Zahner, L., Schindler, C., Meyer, U., Hartman, T., Hebestreit, H., Brunner-La Rocca, H. P., van Mechelen, W., Puder, J. J. (2010). Effect of school based physical activity programme (KISS) on fitness and adiposity in primary schoolchildren: cluster randomised controlled trial. *British Medical Journal*, *340*, c785.
- Kubesch, S., Walk, L., Spitzer, M., Kammer, T., Lainburg, A., Heim, R., Hille, K. (2009). A 30-minute physical education program improves students' executive attention. *Mind Brain Education Journal*, *3*, 235-242
- Kuo, J., Voorhees, C. C., Haythornthwaite, J.A., & Young, D.R. (2007). Associations between family support, family intimacy, and neighborhood violence and physical activity in urban adolescent girls. *American Journal of Public Health*, *97*(1), 101-103.
- Li, Y., Dai, Q., Jackson, J. C., & Zhang, J. (2008). Overweight is associated with decreased cognitive functioning among school-age children and adolescents. *Obesity (Silver Spring)*, *16*(8), 1809-1815.
- Matějček, Z. (2004). *Prvních 6let ve výchově a vývoji dítěte*. Praha: Grada.
- Oliver, M., Schofield, G. M., & Kolt, G. S. (2007). Physical activity in preschoolers: Understanding prevalence and measurement issues. *Sports Medicine*, *37*(12), 1045-1070.
- Pica, R. (2004). *Experiences in Movement: Birth to Age Eight*. 3rd ed. Clifton Park, New York: Thomson/Delmar Learning.
- Piers, E. V., Harris, D. B., Herzberg, D. S. (2009). *Piers-Harris Children's Self-concept Scale – Piers-Harris 2*. 5<sup>th</sup> edition. Los Angeles: Western Psychological Services, 2009.
- Pearce, A., Scalzia, D., Lynchac J., & Smithers, L. G. (2016). Do thin, overweight and obese children have poorer development than their healthy-weight peers at the start of school? *Early Childhood Research Quarterly*, *35*, 2nd Quarter, 85–94.
- Reed, J. A., Einstein, G., Hahn, E., Hooker, S P., Gross, V. P., & Kravitz, J. (2010). Examining the impact of integrating physical activity on fluid intelligence and academic performance in an elementary school setting: a preliminary investigation. *Journal of Physical Activity Health*, *7*, 343-51.
- Resnick, A. M., Bishop, M., O'Connel, A., Hugo, B., Timm, A., Ozonoff, A., & Geller, A. C. (2009). The CHEER Study to Reduce BMI in Elementary School Students: A School-Based, Parent-Directed Study in Framingham, Massachusetts. *Journal of School Nursing*, *72*(5), 361–372. doi: 10.1177/1059840509339194
- Serassuelo Junior, H., Cavazzotto, G. T., Paludo, A. C., Zambrin, L. F., & Simões, A. C. (2014). The impact of obesity on the perception of self-concept in children and adolescents. *Rev. bras. cineantropom.* *17*(2), 165–174. ISSN 1415-8426. <http://dx.doi.org/10.5007/1980-0037.2015v17n2p165>.
- Schulz, A., & Northridge, M. E. (2004). Social Determinants of Health: Implications for Environmental Health Promotion *Health Education & Behavior*, *31*(4), 455–471.

- Smith, A. L., Hoza, B., Linnea, K., McQuade, J. D., Tom, M., & Vaughn, A. J. (2013). Pilot physical activity intervention reduces severity of ADHD symptoms in young children. *Journal of Attention Disorders, 17*, 70–82.
- Strauss, R.S. (2000). Childhood obesity and self-esteem. *Pediatrics, 105*(1), e15.
- Wake, M., Clifford, S. A., Patton, G. C., Waters, E., Williams, J., Canterford, L., & Carlin, J. B. (2013). Morbidity patterns among the underweight, overweight and obese between 2 and 18 years: population-based cross-sectional analyses. *International Journal of Obesity, 37*(1), 86-93,
- World Health Initiative [WHO]. Global Strategy on Diet, Physical Activity and Health [online]. 2011 [cit. 15. 11. 2011]. Dostupné z: <http://www.who.int/dietphysicalactivity/pa/en/index.html>
- Wild, E. & Möller, J. (2009). *Pädagogische Psychologie*. Berlin: Springer-Verlag, Berlin Heidelberg.
- World Health Organisation (2011). Global Strategy on Diet, Physical Activity and Health. Retrieved from World Wide Web: <http://www.who.int/dietphysicalactivity/summary-report-09.pdf?ua=1>.
- Zeller, M. H., Reiter-Purtill, J. & Ramey, C. (2008). Negative Peer Perceptions of Obese Children in the Classroom Environment. *Obesity, 16*(4), 755-762. doi:10.1038/oby.2008.4