

A PRESCHOOLERS' SCHOOLBAG

Preliminary communication

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Abstract

The goal of this research was to determine the percentual relation of body weight of preparatory preschool children and the weight of their bag in the frame of the standards prescribed from the World Health Organization and their attitude towards the schoolbag. The research had transversal character and it was realized in the second term of 2015/2016 school year in preschool institution "Decija Radost" in Svilajnac. The sample of examinees consisted of 90 boys and 90 girls. The results indicate a large span of values of body weight, a schoolbag's weight and percentage relationship of body weight and a preschoolers' bag weight. The percentage relationship for boys and girls overcomes 10% of the prescribed values from the World Health Organization. Most boys arrive to kindergarten on foot, and most girls arrive by car. A schoolbag is carried on both shoulders. In most of the cases parents help their preschoolers in packing of the schoolbag. The pain during carrying of the schoolbag is present and the most prominent in the neck and back. A heavy bag of preschoolers and later pupils of younger school age is not a problem only in Serbia but in the whole world.

Keywords: *preschooler, body mass, boys, kindergarten children, incorrect body posture, body deformities, physical education, anthropometric measurements, questionnaire*

INTRODUCTION

Besides too heavy schoolbag which is typical in most of the cases for pupils of younger school age, especially for second grade pupils (Markovic, Visnjic & Ignjatovic, 2013), a heavy schoolbag became typical for preschoolers. In preschoolers' bag, as well as in the schoolchildren's schoolbag we can find workbooks, notebooks, pencils, markers, snacks, water bottle and many other materials needed for the realization of directed activities, which make a bag heavier than 10% of the total body weight of preschoolers. In "The Monika Project" done on Novi Sad within preschoolers and school children, it was noticed that 2/3 of the children have incorrect body posture, 5% deformity of spine, and 25% deformity of feet, while these parameters increase by children's going to higher grades of primary school. The results of the latest examinations indicate that every third child in Serbia has some sort of body deformity due to carrying of a heavy schoolbag. The doctors advise that it is necessary that teachers and parents monitor their children and as soon as they notice some suspicious elements of body posture to take a child to the doctor, since the chance to cure such a problem is greater if the deformity is revealed in the beginning. They also think that the prevention is very important in such a way as to direct children with the agreement of the teachers not to carry things which are not needed for the day. Besides the heavy rucksack, an incorrect body posture, as well as deformities, increases steadily in preschool period, i.e. during the preparatory year before starting the first grade, where a preschooler meets the system of activities in preschool which demand sitting and preparation for the introduction to the system of primary education.

On the other hand, the World Health Organization recommends that the maximal weight of a schoolbag with the stationery and all other equipment should not be bigger than 10% of the total child's body weight, which is valid in Serbia and the surrounding countries (Fosnarić & Delcnjak Smrecnik, 2007; Pausic & Kujundzic, 2008; Miloradovic,

Pausic & Kuzmanic, 2014) and other countries on all continents (Feingold & Jacobs 2002; Korovessis, Koureas, Zacharatos, & Papazisis, 2004).

The key role in the correct development of a child is played by preschool in which by the use of preschool education and training the rights of children are realized, as well as the fulfillment of their needs. The children's needs and rights are to be born and live in the surrounding which will improve their mental and physical health, in which they will feel accepted and loved, in which there will be the best conditions for their development, growth and studying (Basics of the Programme, 1996: 6).

The contents of physical activity in preschool as well as well balanced and systematically planned programme influence to a great extent on correctly, healthy and balanced developed child.

On the basis of many studies on primary school level, the idea was to analyze the current situation in preschools and to give recommendations for the work with preschoolers.

The goal of this research was to determine the percentual relationship of the body weight of a preschooler in preparatory programme and the weight of a schoolbag in the frame of the standards prescribed by the World Health Organisation and their relationship towards a schoolbag.

METHODS

The research was realized during the 2015/2016 school year in preschool "Decja Radost" in Svilajnac. After the approval of the parents and the principal of the preschool the measuring of the body weight was realized by the expert cooperator for physical education with experience from the previous anthropometric measurements, while the schoolbag weight was measured by the nurses in their groups. All measurements were realized during directed motor activities in physical education. Apart from measurement, the preschoolers filled the questionnaire with the help of their parents and it consisted of four ques-

tions. The sample of examinees for the planned research was formed in accordance with the planned goal and it consisted of 180 examinees from preparatory preschool groups, divided into two characteristic sub samples according to the criteria of gender: 90 boys and sub sample of 90 girls. In the frame of quantitative analysis of the data a percentual research of frequencies was applied.

RESULTS

By the insight in the Table 1., it can be seen that the values of boys' and girls' weight do not essentially vary from the value for their age.

Table 1. Minimal, average and maximal values of the boys' and girls' body mass

Sex	Min	Mean	Max
Boys	15,2	23,0	30,5
Girls	15,0	21,7	30,2

The average body weight of boys is 23 kg, and the average body weight of the girls is 21,7 kg. The thing which is evident is variation width which is for boys in interval from 17 to 34 kg, and for girls in interval from 16 to 33 kg, which indicates that there is a big percent of obese children in preschool age?

Table 2. Minimal, average and maximal values of boys' and girls' schoolbag weight

Sex	Min	Mean	Max
Boys	2,4	2,9	3,6
Girls	1,5	2,4	3,0

The values indicate that the smallest weight of a schoolbag for boys is 2,4 kg and for girls it is 1,5 kg, the difference of 0,9 kg is in favor of the boys. The biggest measured weight of a schoolbag is for boys and it is 3,6 kg and for girls it is 3,0 kg, the difference of 0,6 kg is in favor of the boys. The average value for boys is 2,9 kg and for the girls it is 2,4 kg.

Table 3. The relation between the body weight and the schoolbag weight for preschoolers

Sex	Min	Mean	Max
Boys	7,98%	12,86%	19,05%
Girls	8,13%	11,32%	17,53%

The minimal value of the relation between the body weight and the schoolbag weight for boys is 7,98% and for girls it is 8,13%. Maximal values of the relation of the body weight and the schoolbag weight for boys are 19,05% and for girls 17,53%. Variation width for the boys is higher in relation to the girls. The average values of the relation of the body weight and a schoolbag weight for boys are higher and they are 12,86% and for girls 11,32%. On the basis of the results it can be stated that the preschoolers carry a schoolbag whose weight is over recommended 10% from the total weight of the body, which is contrary to the recommendation of the World Health Organization.

Table 4. The way of coming to preschool

Sex	On foot	By car	By bus
Boys	71,11%	20,00%	4,41%
Girls	30,21%	43,33%	20,00%

The very important factor in the reduction of the problem of a heavy schoolbag is the way of arriving of the children to preschool. In percents most boys 71,11% come to kindergarten on foot. The girls have a bit different situation and most of them come to kindergarten by car (43,33%). The smallest number of the boys 4,40% and the girls 20,00% arrive to kindergarten by bus. In most cases these are the children from the suburbs.

Table 5. The help while packing of the schoolbag

Sex	Alone	Parents	Brother-Sister
Boys	33,44%	55,55%	10,00%
Girls	27,77%	48,88%	22,33%

Considering their age, the preschoolers need help when packing their bags and in most cases the parents are involved in this in 55,55% for boys and 48,88% for girls. The boys are partially more independent and 34,44% pack their bags without anybody's help, while 27,77% of the girls do it independently. In smaller percent, for boys 10% and for girls 22,33% the needed advice or physical help before going to kindergarten is given by an older brother or a sister. These are the situations when parents are not able to escort their small preschooler.

Table 6. The way of carrying the bag

Sex	Over one shoulder	The loins	In hand
Boys	14,44%	57,77%	24,20%
Girls	13,33%	65,55%	19,80%

The purchasing of a bag has always been a problem, how to balance functionality, price and a child's wish. The doctors recommend that an empty schoolbag must not be heavier than one kilogram. The way of carrying it and the habits acquired in preschool period will be transferred later during the school years. In preschool age the teachers and the parents can influence on the formation of constant habits of carrying a schoolbag. The current situation for the researched sample shows that the highest percent of the boys (57,77%) and the girls (65,55%) carry their bags on back (on both shoulders). A large percent of them carry their bags in hand, which should be corrected, and the smallest percent of the boys (14,44%) and the girls (13,33%) carry their bag over one shoulder.

Table 7. The feeling of pain while carrying a schoolbag

Sex	Neck	Shoulders	Backs	Nothing
Boys	25,90%	18,02%	38,88%	5,23%
Girls	32,30%	15,00%	44,44%	4,92%

The carrying of a schoolbag itself and bad habits can influence on everyday discomfort manifested as pain on different places. The way of carrying the bag will condition the painful spot. A long term incorrect carrying of the load, in this case the bag, will lead to incorrect body posture and spine deformity as well as legs deformity. For the children the pain is the most present in back with 38,88% for the boys and 44,44% for the girls. The pain in back and the pain in the neck are caused by compensatory movements while carrying a heavy bag on back. The pain in the shoulder is directly caused by carrying of the bag over one

shoulder or in one hand. The teacher's task is to direct towards acquiring habits for carrying the bag on both shoulders (on the back).

DISCUSSION

Body weight can be attributed to natural growth and development, socio economic factors, i.e. conditions which rule in the family in which a child lives and to the extent of body movement-exercise during the daily activities. Body weight is in the interval between 17 and 34 kg and it is similar to the values acquired in the research of Markovic and Sekeljic (2008b), where the body weight of preschool boys was in the range between 18,4 and 46,7 kg. The bigger range in the research of Markovic and Sekeljic (2008b) can be attributed to individual cases. For girls the range of body weight is in the interval between 16 to 33 kg and it is almost identical to the values in the research of Markovic (2008a), where the range of the body weight for preschool girls was in the interval between 18 to 35,5 kg. The weight of the schoolbag of preschoolers is in most cases heavier and the percental relation between body weight and the bag weight surpasses 10% recommended by the World Health Organisation.

The average values of the relation of the body weight and the bag weight for boys is 12,86% and for girls it is 11,32%. On the basis of the results it can be stated that the relation between the body weight and the bag weight for boys has almost the same value as in the research of Markovic, Višnjic, & Ignjatovic, (2013), where the percental relationship of the body weight and the bag weight of the primary school pupil was 13,05%. On the basis of the values of 12,86% and 13,05% it can be stated that preschoolers are overloaded with the weight of the bag as well as the first grade primary school pupils. Maximal value of the relation of the body weight and the bag weight for boys is 19,05%, and for girls it is 17,53%, at Markovic, Višnjic, & Ignjatovic, (2013), (2013) for the first grade primary school pupils it was 18,80% and it is similar to the values in the research (Pascoe, D.D. Pascoe, D.E., Wang, Shim, & Kim, (1997); Mackenzie, Sampath, Krtise, & Sheir-Neiss, 2003), where the values are over 15%. In most of the studies the average values for pupils are between 10% and 14% (Whittfield, Legg, & Hedderley, (2007); Pausic & Kujundzic, 2008; Kath et al., 2002; Voll & Klimt, 1977).

Most girls come to school by car, and most boys come to school on foot. For pupils the situation is completely different and most of them come to school by bus (Markovic, Sekeljic, & Milanovic, 2016). It is relieving that a schoolbag is carried on the back, on both shoulders. For schoolgirls it was noticed that there is a tendency of carrying a bag on one shoulder in high percent (30,31%) (Markovic, Višnjic, & Ignjatovic, 2013). In most of the cases the parent help to boys and girls while packing their schoolbags. A smaller percent of boys (34,44%) and girls (27,77%) pack their bags without anyone's help. This percent is significantly higher for schoolboys and schoolgirls and it is 89%, which is not good (Markovic, et al., 2016). A heavy schoolbag on weak shoulders causes pain which is most often in the area of the back and the neck. The load which is carried for a long time will condition incorrect forming of physiological curves of the spine and lowered the feet arch (Mackenzie et al., 2003). In England around 45% of students have periodical pains in the back and the neck (Troussier, Davoine, de Gaudemaris, Fauconnier, & Phelip, (1994); Fosnarić et al., 2007).

CONCLUSION

The preschool period is not studied enough and it is usual that in the newspapers, in magazines, on lectures and studies, people write and talk about the school children. It is time to start thinking about the preschoolers, i.e. preparatory group which is, according to the data, very loaded and suffers a pain influenced by the heavy schoolbag even in this age. Beside the teachers the problem is actual and the preschool teachers should think about it and not only when it manifests bigger negative characteristics like body deformities of school children.

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REFERENCES

- Feingold, A., & Jacobs, K. (2002). The effect of education on backpack wearing and posture in a middle school population. *Work*, 18(3), 287–294.
- Fosnarić, S., & Delcnjak Smrećnik, I. (2007). Physical overburdening of pupils with the weigh of school bags during the period of passing from eight year primary school to nine year primary school. *Informatologia*, 40(3), 207–210.
- Kath, D.W.B., Ann, C.P., Gareth, T.J.B., Stewart, T., Deborah, P.M.S., Alan, J. S., ...Gary, J.M.B. (2002). Low back pain in school children: occurrence and characteristics. *Pain*, (97), 87–92.
- Korovessis, P., Koureas, G., Zacharatos, S., & Papazisis, Z. (2005). Backpacks, backpain, sagittal spinal curves and trunk alignment in adolescents. *Spine*, (30), 247–255.
- Marković, Ž. (2008a). Uticaj celodnevno i poludnevno boravka na antropometrijske karakteristike i motoričke sposobnosti predškolskog uzrasta [The influence of a full day and a half day stays on anthropometric characteristics and motor abilities of preschoolers. In Serbian.] *Uzdanicca*, (1), 104–117.
- Marković, Ž., & Šekeljić, G. (2008b). Uticaj boravka u predškolskim ustanovama na fizički razvoj i fizičke sposobnosti [The influence of stay in preschools on physical development and physical skills. In Serbian.] *Zbornik radova Učiteljskog fakulteta, Užice*, 2008, 9, (pp. 79–94).
- Marković, Z., Višnjic, D., & Ignjatović, A. (2013). A schoolbag of village schools' pupils. In A. Nedeljkovic (ed.), *Book of Proceedings, International Scientific conference, Belgrade, 2013, "Effects of Physical Activity Application to Anthropological Status with Children, Youth and Adults"* (pp. 82–87). Belgrade: Faculty of Sport and Physical Education.
- Marković, Z., Sekeljić, G., & Milanović, S. (2016). Schoolbag-eternal problem. *Research in Kinesiology*, 44(2), 242–245.
- Mackenzie, W.G., Sampath, J.S., Krtise, R.W., & Sheir-Neiss, G.J. (2003). Backpacks in children. *Clinical Orthopaedics and Related Research*, 409, 78–84.
- Miloradović, M., Pausić, J., & Kuzmanić, B. (2014). Differences in body posture and balance in children of classroom teaching attending and not attending extended stay. *Research in Physical Education, Sport and Health*, 3(2), 135–140.
- Osnove programa predškolskog vaspitanja i obrazovanja dece uzrasta od tri do sedam godina* [The basics of the programme of preschool education of the children aged from three to seven years. In Serbia.] (1996). Beograd: Prosvetni pregled.
- Pascoe, D.D., Pascoe, D.E., Wang, Y.T., Shim, D.M. & Kim, C.K. (1997). Influence of carrying book bags on gait cycle and posture of youths. *Ergonomics*, 40(6), 631–641.

- Pausic, J., & Kujundzic, H. (2008). The weight of a schoolbag of a younger school aged children. In B. Maleš (ed.), *Proceedings of the 3rd International Conference "Contemporary Kinesiology"*, Mostar, 2008, (pp.183–187). Split: Faculty of Kinesiology.
- Troussier, B., Davoine, P., de Gaudemaris, R., Fauconnier, J., & Phelip, X. (1994). Back pain in schoolchildren: a study among 1178 pupils. *Scand J Rehab Med*, 26(3), 143–6.
- Voll, H.J., & Klimt, F. (1977). Die beanspruchung des Kindes durch die schultasche. *Offentliche Gesundheitswesen*, 39, 369–378.
- Whittfield, K. J., Legg, S. J., & Hedderley, D. I. (2007). The weight and use of schoolbags in New Zealand secondary schools. *Ergonomics*, 44(9), 819–824.

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