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Correlation between the Body Mass of the Preschool Children and the Schoolbag Weight²

Extended summary

An overview of the relevant research does not provide a full answer regarding the exact maximum allowed ratio of body weight and schoolbag weight. Some research indicates that the allowed ratio is only 5%. The results of Prvan and Versić (2011) show that the deterioration of the body is greatest between the spot without load (0%) and the first spot with load (5%) when children change their body posture immediately after the first load. The head is moving forward and there is a pain in the neck (Hundekari, Chilwant, Vedpathak, & Wadde, 2013). Children feel pain both in the neck and in the back. (Reneman, Poels, Geertzen, & Dijkstra, 2006). Numerous studies show that most children carry the load exceeding 10% of their body weight (Feingold and Jacobs 2002; Van Gent, 2003; Korovessis et al., 2004). On the other hand, the World Health Organization recommends that the maximum weight of a schoolbag with the stationery and all other equipment should not exceed 10% of the total body weight of a child. The children who carry heavy schoolbags and suffer pain in the spinal cord are exposed to a greater risk of spinal cord conditions later in life, when they become adults (Mackenzie et al., 2003).

The goal of this research was to determine the correlation in percentages between the body weight of preschool children and the weight of their schoolbags in the framework of the standards prescribed by the World Health Organization as well as to examine pupils' attitudes towards carrying schoolbags.

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The research was conducted during the school year 2015/2016 at the preschool institution "Dečija Radost" in Svilajnac. Upon the approval of parents and the principal, the school associate for physical education experienced in anthropometric measuring carried out the measuring of the children's body weight, while the schoolbag weight was measured by the preschool teachers. In addition, the preschool children, assisted by their parents, filled in a questionnaire consisting of four questions. The research was formed in accordance with the planned goal and it consisted of 180 respondents from preschool groups, divided into two characteristic subsamples according to their gender: 90 boys and 90 girls. The frequencies were expressed in percentages within the framework of the quantitative analysis.

Body mass ranges from 17 kg to 34 kg, which is similar to the values acquired in the research of Marković and Šekeljić (2008), where the body weight of preschool boys was in the range between 18,4 kg and 46,7 kg. The bigger range in the research of Marković and Šekeljić (2008) can be attributed to individual cases. For girls, the range of body weight is between 16 kg and 33 kg, and it is almost identical to the values in the research of Marković (2008), where the body mass of preschool girls ranged from 18 kg to 35,5 kg. The weight of the preschoolers' schoolbag is generally bigger and the correlation between body weight and bag weight exceeds the 10% recommended by the World Health Organization.

The average values of the correlation between the body weight and the bag weight for boys are 12,86% for boys and 11,32% for girls. The results indicate that the correlation between the body weight and the bag weight for boys has almost the same value as in the research of Marković et al. (2013), where the correlation between 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%, our conclusion is that preschool pupils carry the same weight in their schoolbags as the first-grade primary school pupils. In the research of Marković et al. (2013), the maximum value of the correlation between the body weight and the bag weight is 19,05% for boys and 17,53% for girls, whereas the results of the research carried out by Marković et al. (2013) indicate 18,80% in the case of first-graders. These values are similar to the ones obtained in other research (Pascoe et al., 1997; Mackenzie et al., 2003), where the values exceed 15%.

Most girls go to their preschool institution by car and most boys go on foot. Primary school pupils mostly go to school by bus. The fact that a schoolbag is carried on the back, on both shoulders, is quite satisfying. Parents generally help boys and girls to pack their schoolbags. A smaller percentage of boys (34,44%) and girls (27,77%) pack their bags without anyone's help. This percentage is significantly higher for schoolboys and schoolgirls (89%), which is not good. 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 foot arch.

It is time to start thinking about preschool children, i.e. preschool preparatory groups who, according to the obtained data, carry a very heavy load and suffer pain caused by heavy schoolbags even in at this early age. This problem is pressing and should be dealt with not only by primary school teachers and teachers of different school subjects, but also by preschool teachers. The consequences should be prevented at this early stage, before they result in physi-

cal deformities of primary school children. A heavy bag of preschoolers, and later pupils in the lower grades of primary school, is not a problem only in Serbia but in the whole world.

Keywords: preschool children, schoolbag, correlation, body mass.

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