



Parents' Knowledge and Attitudes When Choosing Their Children's School Bag: an Introductory Study

Dijana Laštro,¹ Mirsad Muftić,² Nenad Ponorac,³ Dubravko Bokonjić⁴

Abstract

Background/Aim: A school bag is a device whose purpose is to store things that are necessary for a child in performing daily productive activities. The aim of the research was to examine how much parents are informed about the school bag and which specifications are crucial when choosing a school bag for their children.

Material and methods: The prospective study included 150 parents of students aged 11 to 12 from Banja Luka. For the purposes of the research, a questionnaire with closed and open questions was used.

Results: More than 97 % of the surveyed parents belonged to the age range of 30 to 49 years. The largest number of surveyed parents have had secondary education 44 %, but the number of university-educated parents was also very high 39.3 %. Ninety-six percent of students used a backpack. School bags in 97.4 % of cases were purchased in stores. Only in 10 % of cases, school bags fully meet the basic criteria. In the remaining 90 % of cases, there was an absence of at least one or more desired characteristics. Using the Chi-squared test ($\chi^2 = 245.45$; $p < 0.001$), a significant difference between the desired and the achieved result was statistically proven. 77.3 % of parents did not receive information about the school bag. Salespeople (11.3 %), other parents and friends (9.3 %) were the main source of information before purchasing a school bag. In the future, 54 % of parents would like to get information about the school bag through lectures and practical workshops for children and parents.

Conclusion: Greater information enables adequate selection and reduces the possibility of marketing tricks and influences on consumers when choosing the desired product such as a school bag. Parents have an important role to play in ensuring unhindered growth and development during the educational process and in raising children's awareness and supervision of the proper use of the school bag.

Key words: Schoolbag; Parents; Knowledge; Awareness.

- (1) Institute for Physical Medicine and Rehabilitation "Dr. Miroslav Zotović", Banja Luka, the Republic of Srpska, Bosnia and Herzegovina.
- (2) Faculty of Health Studies, University of Sarajevo, the Federation of Bosnia and Herzegovina, Bosnia and Herzegovina.
- (3) Department of Physiology, Faculty of Medicine, University of Banja Luka, Banja Luka, the Republic of Srpska, Bosnia and Herzegovina.
- (4) Medical Faculty of the Military Medical Academy, University of Defence, Belgrade, Serbia.

Correspondence:
DIJANA LAŠTRO
E: dijana.lastro@med.unibl.org

ARTICLE INFO

Received: 24 May 2021
Revision received: 21 June 2021
Accepted: 21 June 2021

Introduction

Carrying a school bag is a common way of carrying teaching aids and accessories that are necessary for a child to perform daily productive activities. Numerous studies have reported side effects associated with school bag use, prevalence, and risk factors such as back pain in younger students.¹⁻³

According to a University of Boston study, about 85 % of students report discomfort and pain associated with backpack use on their own. Being overweight can lead to health problems in the short and long term. Improper use of backpacks can lead to muscle imbalance that could turn into

chronic neck and back pain.⁴ A systematic review by Balamurugan (2017) reports that a school bag, that is approximately 10 – 15 % of body weight can cause overload of the cervical spine and upper limbs, when burdened by weight in the thoracic spine.⁵ Weight has a significant effect on the centre of gravity of the body taking into account appropriate carrying techniques. Different bag carrying techniques are a significant factor influencing the posture and gait of students between of ages 11 - 13 years.

Studies have reported that there is no difference in lateral spinal deviation between two-strap backpacks and students without a bag, however, the belt on the school bag reduces the strain on the back, neck and shoulders.⁶⁻⁸ Carrying a school bag has significant biomechanical, physiological and adverse effects on the wearer, especially with loads greater than 10 % of the student's body weight. Such effects may include changes in posture (eg, changes in spinal posture, lumbosacral angles, and thoracic kyphosis), gait, increased physical discomfort, muscle activity, and increased respiratory rate.⁹ Nevertheless, concerns have been raised about the possible harmful consequences of using a school bag, especially related to overweight, back position and suboptimal design aspects such as uncomfortable shoulder straps and the absence of shoulder straps.¹⁰⁻¹³

American Association for Occupational Therapy, The American Academy of Orthopaedic Surgeons and the International Association of Paediatric Chiropractors suggests that the load should not exceed 10 %, the American Association of Physical Therapy suggests 15 %, and the American Association of Chiropractors 5-10 % of body weight.¹⁴ A comprehensive understanding of the recommended measures is necessary to achieve the desired effect. Authors Dianat and Karimi (2014) concluded in the study that parental awareness should play an important role in changing children's school bag carrying habits, and especially in reducing the weight of the burden they carry. This highlights the need to incorporate guidelines and recommendations into practice to ensure that the health and safety of schoolchildren is not compromised when using a school bag.¹⁵ Although the American Association of Occupational Therapists (AOTA, 2014) has issued guidelines for the proper use of a school bag, in our country there is a lack of such prevention programs.¹⁶

The goal of this research was to examine how much parents are informed about the school bag and what specifications are crucial when choosing a school bag for their children.

Methods

The research was a prospective study. Using the cluster sampling method, the study included 1507 parents of students aged 11 to 12, of seven primary city schools from Banja Luka. After meeting the criteria for inclusion and testing students with a physical activity test (The Physical Activity Questionnaire for Older Children, PAQ-C),^{17, 18} respondents with their parents entered the study successively and were divided into three groups: insufficiently physically active, moderately, and highly physically active children. Sampling was performed until the number of 150 respondents of both sexes and their parents was filled.

Criteria for inclusion: children of older primary school age 11-12, both sexes, children who have signed written consent of a parent or legal representative, children who have agreed and signed written consent to participate in the research and children who have the ability to self-ambulance.

Exclusion criteria: children with intellectual disabilities, epilepsy, cerebral palsy, hemiparesis, diabetes mellitus, heart and circulatory diseases, respiratory diseases, children with a history of fractures or injuries of the lower extremities in the past year, children who used a mobility aid, fatigue, pain and inability to adapt to the work of the zebriis strip.

The research was approved by the Ministry of Education and Culture of the Republic of Srpska (Approval Certificate No 07.041/059-3292/18 dated 17 December 2018 and No 07.041/059-2436/19 dated 25 September 2019 and the Ethics Committee of the Medical Faculty of the University of Banja Luka (Approval Certificate No 18/14.27/19 dated 1 July 2019 and No 18/4.27-1/20 dated 5 February 2020). All respondents and parents gave their voluntary consent, which in addition to the oral explanation was also contained in the informed consent for parents and students and written information for parents and students. The research was conducted during the school year 2019/2020 and 2020/2021.

For the purposes of the research, a survey questionnaire for parents based on previous research was used and adapted to the needs of the research itself.¹⁹ The survey questionnaire is designed to assess parents' awareness of the factors associated with carrying a school bag as well as which specifications are crucial when choosing a school bag. The questionnaire consisted of 37 questions that were mostly with one or more choice answers closed ($n = 34$) and open type ($n = 3$). From the survey questionnaire, items related to information on demographic data and family structure, school bag design, type, weight, importance of school bag characteristics, place of school bag procurement, availability and request for use of information and parental education were selected.

The parents were interviewed at the school and at the Institute for Physical Medicine and Rehabilitation "Dr Miroslav Zotović" in Banja Luka. The research was conducted by a research team consisting of the main researcher, occupational therapist-physiotherapist and trainee occupational therapist.

Complete statistical analysis of data was done with the statistical software package, SPSS Statistics 18. Most of the variables were presented in a text and table as frequency (%) of certain categories. Statistical significance between groups (categorical data) was tested by Chi-squared test. In case of continuous data, variables were presented as mean value \pm standard deviation (SD). All analyses were estimated at minimum $p < 0.05$ level of statistical significance.

Results

The results of the descriptive analysis of the basic characteristics of the school bag that children had, and the compliance of the desired and realised characteristics of the bag are shown in the table (Table 3 and 4), as well as demographic and socio-economic characteristics of the sample, school bag procurement (Table 1 and 2), and graphically (Figure 1, 2, 3) the importance of school bag characteristics, sources of information that parents have used and would like to use in the future about the school bag. The values of the results of the descriptive statistics are shown in absolute numbers and percentages (%).

Table 1: Basic demographic characteristics of the surveyed parents

Demographic characteristics	Total number of respondents (N = 150)	
	N	%
Gender		
Male	62	41.3
Female	88	58.7
Age		
< 30	1	0.7
30-39	68	45.3
40-49	78	52.0
50-59	3	2.0
Education		
Elementary school	1	0.7
High school	66	44.0
High school	9	6.0
Faculty	59	39.3
Master of Science	10	6.7
Doctor of Science	5	3.3
Marital status		
Married	132	88.0
Divorced	13	8.7
Unmarried	2	1.3
Divorced	1	0.7
Widow / Widower	2	1.3

Parents of both sexes participated in the survey, and mothers were numerically dominant (88; 58.7 %). More than 97 % of the surveyed parents belonged to the age range of 30 to 49 years. The largest number of surveyed parents had secondary education (44 %), but the number of university-educated parents was also very high (39.3 %). In 88 % of cases, these were, at least formally, standard marriages.

Table 2: Basic socio-economic characteristics of the surveyed families

Socio-economic characteristics	Total number of respondents (N = 150)	
	N	%
Property status of the family		
Satisfactory	120	80.0
Somewhat satisfying	29	19.3
Unsatisfactory	1	0.7
The environment where they live		
City	118	78.7
Suburban	32	21.3
Rural	0	0.0
Number of children in the family		
One	23	15.3
Two	87	58.0
Three or more	40	26.7
Family type		
Extended (2 generations)	16	10.7
Family with 1 parent	19	12.7
A family with both parents	115	76.7

Of the total number of respondents, 120 (80 %) thought that household income is satisfactory. Almost the same percentage of families lived in urban areas, and the rest (21.3 %) were located in

suburban settlements. The largest percentage of families had two children (58 %), three or more children also had an enviable percentage of respondents (26.7 %). In most cases (76.7 %) these were families with both parents.

Table 3: Basic characteristics related to the procurement of a school bag

School bag	Total number of respondents (N = 150)	
	N	%
Participant in election¹		
Mother	93	62.0
Father	31	20.7
A child	90	60.0
The others	2	1.3
Method of procurement²		
Shop	146	97.4
Via the Internet	2	1.3
From family members (used)	2	1.3
From a friend (used)	0	0.0
Other	0	0.0

(1) possible multiple choice, percentages of individual answers exceed 100 %
 (2) there is a possibility of only one answer, the total percentage is 100 %

A high percentage of mother and child were involved (62 % and 60 %, respectively) in the purchase of a school bag, and the fathers were involved in the purchase of only one in five children (31; 20.7 %).

When it comes to participants in the selection of school bags, in 99 cases (66.0 %) only one of the above persons participated in the selection, in 37 (24.7 %) 2 of the above persons participated in the procurement, in 13 (8.7 %) cases of 3 per-

Table 4: Type and basic characteristics of the school bag that children have

School bag	Total number of respondents (N = 150)	
	N	%
Type¹		
Backpack	144	96.0
Wheeled bag	5	3.3
One shoulder bag	1	0.7
Sports bag	0	0.0
Characteristics²		
Reinforcement on the shoulders	133	88.7
Belt over chest	45	30.0
Waist belt	31	20.7
Partitions	113	75.3
Adjustable shoulder straps	116	77.3
Wheels	5	3.3
Cat's eyes	22	14.7
Rear reinforcement	94	62.7
Mobile phone pocket	58	38.7
Side pockets for storing things	116	77.3
Other	3	2.0

(1) there is a possibility of only one answer, the total percentage is 100 %
 (2) multiple choice possible, percentages of individual answers exceed 100 %

sons and only in 1 case (0.7 %) all 4 listed persons (data are not shown in the table).

School bags were predominantly procured in stores (97.4 %) and only sporadically via the Internet or by downloading used bags from other family members (2.6 %).

The dominant type of school bag purchased was the backpack model (96 %), and only sporadically the wheeled bag (3.3 %) (Table 4).

Among the characteristics that the purchased school bags had, according to their high representation, stand out reinforcement on the shoulders (88.7 %), adjustable shoulders (77.3 %) and side pockets for storing things (77.3 %).

Table 5 shows the desirable characteristics that a school bag must meet (left) and the real situation achieved by purchasing school bags (right). In a very small number of cases (15 school bags; 10 %), the basic criteria was fully met.

Table 5: Conformity of desired and realised characteristics of school bags

School bag	The presence of all 6 desired characteristics	
	No	Yes
Minimum of desired characteristics		
Reinforcement on the shoulders	135 (90 %)	15 (10 %)
Belt over chest		
Waist belt	$\chi^2 = 245.45$	
Adjustable shoulder straps	$p < 0.001$	
Rear reinforcement		
Side pockets for storing things		

Using the Chi-squared test ($\chi^2 = 245.45$; $p < 0.001$), a significant difference between the desired and the achieved result was completely statistically proven. In the remaining number of cases (90 %), there is an absence of at least one or more desired characteristics.

A detailed analysis of the data from the Table 4 revealed that in most cases, the purchased school bags lack 2 characteristics (chest belt and waist belt are present in only 30 % and 20.7 %, respectively) of purchased school bags.

Ranking was done according to the protocol: 1-Very important; 2-Important; 3-Not very important; 4-It doesn't matter at all; 5-I don't know. The graph presents mean values and standard deviations.

Based on the stated ranking, it is clear that the answers with the lowest average grades indicated the fact of the importance of that characteristic of the school bag. In contrast, characteristics that were of very little importance to parents (or did not know enough about it), during the selection of the school bag, had the highest average grades (mostly above 3, dashed line) (Figure 1).

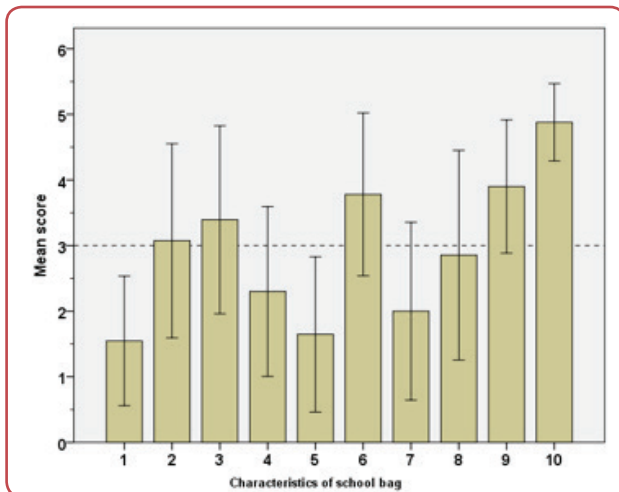


Figure 1: Parents' opinions on the importance of the characteristics that a school bag should have

1 - Shoulder reinforcement; 2 - Chest belt; 3 - Waist belt; 4 - Partitions; 5 - Adjustable shoulder straps; 6 - Wheels; 7 - Reinforcement on the back of the bag; 8 - Cat's eyes; 9 - Mobile phone pocket; 10 - Other; Bars represent standard deviation of the mean;

In general, (Figure 1) most parents did not know the answer (94 %; $n = 141$). Parents considered that the most important characteristics that a school bag should have are reinforcement on the shoulder straps 64.7 % ($n = 97$), adjustable shoulders 65.3 % ($n = 98$) and reinforcement on the back of the bag 49.3 % ($n = 74$). Most of the other characteristics (average grades close to 3 or higher) were rated by the parents as slightly important or unimportant. A relatively small number of parents 28 % ($n = 42$) considered it very important that the school bag has features as a measure of safety and security when moving.

The largest number of parents (36.7 %) estimated that a filled school bag must be lighter than 10 % of body weight, in a slightly lower percentage (35.3 %) the answer was related to the assessment that 5 % is the limit weight of a filled school bag.

Most parents did not receive information about the school bag, 77.3 % ($n = 116$). Vendors 11.3 % ($n = 17$), other parents and friends 9.3 % ($n = 14$) were the main source of information before purchasing a school bag.

Table 6: Parents' assessment of the importance of school bag weight

School bag	Total number of respondents (N = 150)	
	N	%
Weight¹		
Less than 5 % of the child's weight	53	35.3
12 % of the child's weight	3	2.0
Less than 10 % of the child's weight	55	36.7
Less than 20 % of the child's weight	4	2.7
Less than 15 % of the child's weight	9	6.0
There is no standard bag weight	16	10.7
Other	10	6.7

(1) there is a possibility of only one answer, the total percentage is 100 %

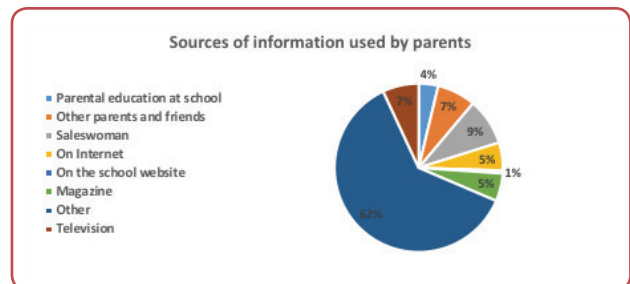


Figure 2: Sources of information used by parents

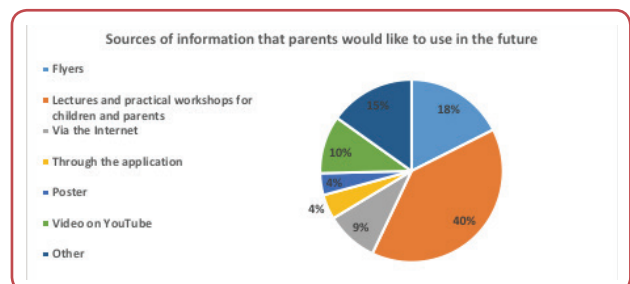


Figure 3: Source of information that parents would like to use in the future

A large number of 54 % ($n = 81$) of parents in the future would like to receive information about the school bag through lectures and practical workshops for children and parents, 24 % ($n = 36$) written materials and video platforms 14 % ($n = 21$).

Discussion

A large number of previous researches on the topic of carrying a school bag for school-age children have been focused on the identification of risk factors that are related to weight, back curvature, the presence of pain, exhaustion and the appearance of fatigue using statistical indicators.²⁰⁻²⁵ However, a small number of authors considered that the role of parents in solving this problem is crucial²⁶⁻²⁸ and that it can significantly contribute to ensuring unhindered growth and development during the child's educational process.

The aim of the study was to examine how much parents are informed about the school bag and which specifications are crucial when choosing a school bag for their children. 150 parents participated in the research, 54 % female ($n = 81$) and 46 % male ($n = 69$). The largest number of parents belonged to the age structure between 40-49 years - 52 % ($n = 78$). Within the professional structure of female respondents, the highest percentage was with undergraduate education 40.7 % ($n = 61$) and male with secondary education 54 % ($n = 81$). The authors of Das and Goswami (2020) in the conclusion of their study reported that the educational qualification of parents acts as a major factor in raising awareness in children and that there are some differences in their views regarding the weight of a school bag. Lower educated parents ignored this problem and did not have enough knowledge about the harmfulness of a school bag, which is in line with the findings of this study.²⁷ The analysis of the family structure showed that the largest percentage of children lived with both parents - 76.7 % ($n = 132$), most often the families of respondents with two children were 57.3 % ($n = 85$), three or more children also had an enviable percentage of respondents (26.7 %) whose income was satisfactory 120 (80 %), of the total number of respondents, statistically, the survey most often covered the first child at birth 63.3 % ($n = 95$). This statement is important, because the attitude and knowledge that parents possess will certainly be applied to their younger children.

In 62 % of cases, the mother and in 60 % of cases the child participated in the selection of the school bag. In 97.4 % of cases, the school bag was purchased in stores. The knowledge gained in this study is important, because greater information of parents enables adequate choice of school bag and reduces the possibility of marketing tricks and influence on consumers when choosing the desired product such as a school bag. A small percentage of children in this sample had a school bag on wheels (3.3 % of students), which indicates that parents do not consider the most suitable bag for a child to be a good choice. In accordance with the findings of previous studies, the backpack is the most common bag used by children, 96 %, ^{28,29} whose characteristics in 88.7 % had a reinforcement on the straps, 75.3 % adjustable straps, 62.7 % and side pockets for disposal of items by 77.3 %. Their children's school bag had a number of satisfactory characteristics and the results were in line with the results of other studies.^{30,31}

Parents' knowledge of the importance of the specifications that a school bag should have was satisfactory. In most cases, 64.7 % ($n = 97$) of parents consider it very important that the straps on the bag have reinforcement, 65.3 % ($n = 98$) adjustable and 49.3 % ($n = 74$) reinforcement from the back foreign bags. Only 30.7 % ($n = 46$) of parents considered it important that a school bag should have a belt over the chest and 20.7 % ($n = 31$) a belt over the waist. The results of this study show that parents' knowledge is unsatisfactory and that the belt over the chest and waist helps distribute the load, which is in line with previous findings of other studies and the importance of health promotion and application and safety of school bags to reduce the incidence of pain in students.³¹ Significantly small number of children, 14 % ($n = 22$) had a cat's eye on a school bag and also a small number of parents, 28 % ($n = 42$) considered it important that the school bag had features as a measure of safety and security when moving. This statement is important and indicates that parents' awareness of safety and security measures when moving is low. The largest number of parents, 36 % ($n = 55$) believed that the weight of the school bag should be less than 10 % of body weight and 35.3 % ($n = 53$) that the weight of the school bag should be less than 5 % of body weight, which indicates that parents were satisfactorily informed about the recommended weight of the school bag, which was stated in a study conducted among 616 parents in Saudi Arabia, which reported that only 37.6 % of fathers and 28.9 % of mothers knew the ideal weight of the school bag.³⁴

Most parents did not receive information about the school bag, 77.3 % ($n = 116$). Salespeople 11.3 % ($n = 17$), other parents and friends 9.3 % ($n = 14$) were the main source of information before purchasing a school bag. Interestingly, 54 % ($n = 81$) of parents have chosen hands-on workshops to adopt new information about the school bag. A small number of parents, 24 % ($n = 36$) considered written materials and video platforms (14 % ($n = 21$)) a good way to gain knowledge and information about the school bag as a teaching tool. The results of this study contradict the results of a study that reported that parents considered written materials as the best source of knowledge acquisition.¹⁹

So far, no studies on information and attitudes of parents about the school bag have been pub-

lished in the Republic of Srpska and the Federation of Bosnia and Herzegovina. The parents' survey was conducted within the project for the development of a doctoral thesis, to obtain more detailed information on wearing habits and characteristics of school bags that may affect further physical development of children.

Conclusion

Most parents, 77.3 % (n = 116) did not receive information about the school bag. Parents demonstrated satisfactory knowledge of the appropriate type of school bag and the allowable weight that the school bag should have. Parents' knowledge was satisfactory about the specifications that a school bag should have, but in 90 % of cases there was the absence of at least one or more desired characteristics of their children's school bag. In most cases (70 % and 79.3 %), school bags lack 2 characteristics (chest belt and waist belt) that help distribute the load during use. Although, we live in the age of information technology, a large number, 54 % (n = 81) of parents in the future would like to get information about the school bag through lectures and practical workshops for children and parents. A small number of parents, 24 % (n = 36) considered written materials and video platforms, 14 % (n = 21) as a good way to gain knowledge and information about the school bag as a teaching tool. Preventive programs enable children and parents to adopt new values, skills for the most correct and uninterrupted functioning of the body in performing daily life activities, applications and safety of students during the use of school bags. Greater parental awareness allows for adequate school bag selection and reduces the possibility of marketing gimmicks and influencing consumers when choosing a desired product, such as a school bag. Parents have an important role to play in ensuring the unhindered growth and development during the child's educational process and in strengthening children's awareness and supervision about the proper use of the school bag.

Acknowledgements

None.

Conflict of interest

None.

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