

A Study to Know Association of Backpack Weight and Backache in School Going Girls of Lahore, Pakistan

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ABSTRACT

Aim: Investigate the effect of school bag weight and carrying methods on back of school going girls.

Study Design: Descriptive cross-sectional study.

Place of Study: One of the private schools in Lahore (Amal School, Tulspura)

Duration of Study: Four weeks in May, 2014.

Methods: Based on randomly selected 109 normal healthy school girls from Amal School in Tulspura area, a private school of Lahore Pakistan. Subjects taken from the age groups 6-15 years. The age of the subjects recorded and confirmed from the school record. Exclusion criteria were any orthopedic problems including foot or ankle deformities and leg length discrepancy.

Results: Out of 109 girls, 65.1% lie in the age group 6-10 years and 39.9 % in the age group 11-15 years. In the weight criteria, 14.7 % lie in 10-19 kg, 45% lie in 20-29 kg, 22.9% in the 30-39 kg, 8.3% in 40-49 kg, 7.3% in 50-59kg and 1.8% in 60-69kgs. Thus, it shows highest percentage (45%) of weight lies in the range 20-29kg. When the weight was measured again with the school bags on girls' Shoulders, the weight increased significantly. After calculations weight of the school bags was found. 29.4% of school bag weight lies in 1-4 kg i.e. normal weight, 67% lie in 5-9 kg i.e. heavy weight and 3.7% lie in the range 10-14 kg i.e., very heavy weight. It shows majority of school girls (67%) carry heavy school bags weighing 5-9 kg. When the school bag percentage relative to the body weight of the girls was calculated, it was found that 13.8% had 1-10% weight of bag which is appropriate range.

Conclusion: Improper use of backpacks is not healthy for anyone, especially for children who are more susceptible to injury because their bodies are growing and developing.

Keywords: Back pain, school children, school bags.

INTRODUCTION

We see it in every girl's school: the slight hunch forward, the tucking of the hand under the stiff strap, the pull and, finally, the struggle to stand up straight. There is a widespread belief that repeated carrying of heavy loads, such as school backpacks, place additional stress on rapidly growing adolescent spinal structures, making them prone to postural change¹. It is reported that musculo-skeletal symptom in school going girls is multifactorial in origin. The carriage of heavy school bag is one of the suspected factors for it². Improper backpack use can also lead to poor posture, later in life. Girls may be especially at risk for backpack-related injuries because they're smaller and may carry loads that are heavier in proportion to their body weight. American Occupational Therapy Association (AOTA) and the American Academy of Pediatrics advise that students should carry no more than 15% or 10-20% of their bodyweight. The trend is particularly troubling because children are now complaining of aches and pains that 'historically haven't shown up until people hit their 30s or 40s.

Unfortunately it has been observed at almost every girl's school that the girls are carrying backpacks that are 25, 30 and 40% of their body weight, as the backpack gets heavier, they alter their posture more, they lean forward to support the weight, and it can cause all kinds of different injuries to their back and neck.

Another problematic book-carrying practice is carrying a pack or bag on just one shoulder, if books are being carried with only one strap, it's an asymmetrical load that's placed on the back and we know from few studies that asymmetry and leaning to one side is probably linked to back pain. Muscle strain is the main problem. You'll get some pain in your back and the body's response to the pain is to shut off the muscles or make them spasm. Then the muscles weaken because they've been in pain and now they can do even less work, so it becomes a downward spiral. The backpacks carried by school going girls as a daily load seem to be a health problem while in school or may be later in life.

MATERIAL AND METHODS

This cross sectional study was conducted in one of the private (Charitable) schools in Lahore (Amal School, Tulspura) during 4 weeks in May 2014 on

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109 female students. Sampling technique was based on random selection of normal healthy school girls. Data was collected on a random day chosen so that the students could not modify their school bag weight and at the beginning of the school day to measure all the books and any food items in it. Based on randomly selected 109 normal healthy school girls from Amal School in Tulpura area, a private school of Lahore Pakistan. Subjects taken from the age groups 6-15 years. The age of the subjects recorded and confirmed from the school record. Exclusion criteria were any orthopedic problems including foot or ankle deformities and leg length discrepancy. Information collected in the form of questionnaire from each subject/student and in small children, the respective teacher provided the required information, if any. The questionnaire consists of two sections; the first section includes the demographic information (name, age, height, weight, school bag weight and percentile of school bag weight to body weight). The second section of the questionnaire includes seven questions, two questions about school bag type and way of carrying, two questions about the presence of pain in different body areas and the location of pain on the diagram; two questions about presence of pain during carrying school bag and pain intensity and one question that asked about the perception of student toward school bag weight. The various parameters considered for the study were height, weight, backpack weight, pain on lumbar flexion, lumbar extension or lumbar lateral flexion. Data auditing was done to detect the anomalies in collected data. Incorrect entries were removed. Data analyzed using SPSS version 16. Synopsis approval from Ethical Committee at LMDC and Consent obtained.

RESULTS

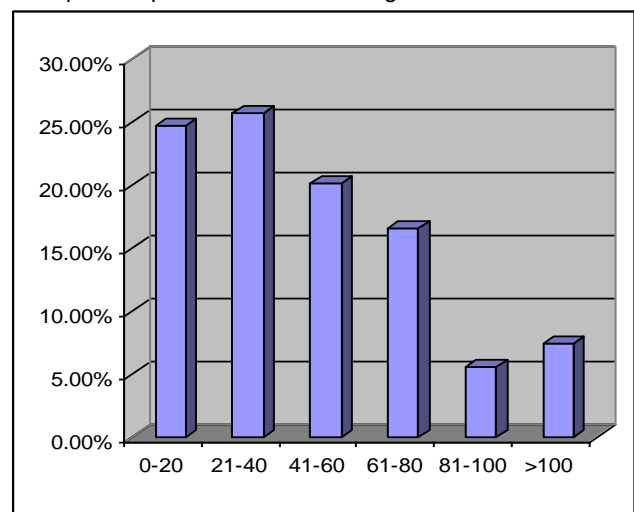
One hundred and nine girls completed the questionnaire and school bag evaluations. As noted in Table1. Out of 109 girls, 65.1 % lie in the age group 6-10 years and 39.9 % in the age group 11-15 years. In the weight criteria, 14.7 % lie in 10-19 kg, 45% lie in 20-29 kg, 22.9% in the 30-39 kg, 8.3% in 40-49 kg, 7.3% in 50-59 kg and 1.8% in 60-69kgs. Thus, it shows highest percentage (45%) of weight Lies in the range 20-29kg. When the weight was measured again with the school bags on girls' Shoulders, the weight increased significantly. After calculations weight of the school bags was found. 29.4% of school bag weight lies in 1-4 kg i.e., normal weight, 67% lie in 5-9kg i.e., heavy weight and 3.7% lie in the range 10-14kg i.e., very heavy weight. It shows majority of school girls (67%) carry heavy school bags weighing 5-9 kg. When the school bag

percentage relative to the body weight of the girls was calculated, it was found that 13.8% had 1-10% weight of school bag which is appropriate range. However most girls had greater percentages which cause back pain issues i.e., 31.25% had 10-15% weight, 45% had 15-20% and 10% had 20-50% weight of school bag in comparison to body weight.

Table 1: Background Information of 109 students

Variables	n	%age
Age in years		
6-10	71	65.1
11-15	38	34.9
Height in meters (m)		
3.0-3.9	20	18.3
4.0-4.9	80	73.4
5.0-6.5	9	8.3
Weight in kilograms (Kg)		
10-19	5	4.6
20-29	30	27.5
30-39	43	39.4
40-49	18	16.5
50-59	8	7.3
60-69	2	1.8
Weight with school bag in Kg		
10-19	5	4.6
20-29	30	27.5
30-39	43	39.4
40-49	18	16.5
50-59	6	5.5
60-69	5	4.6
≥70	2	1.8
Weight of school bag in Kg		
1-4	32	29.4
5-9	73	67.0
10-14	4	3.7
% of school bag to body weight		
1-10	15	13.8
10-15	34	31.2
15-20	49	45.0
20-50	11	10.0

Perception of pain - Whats ur feeling on the scale?



Note: (0 means painless and 100 being very painful)

DISCUSSION

The health and wellbeing of students is a priority subject. It is a great health problem and health professionals should pay more attention to this issue. Carrying school bags is a concern for some students and families, the prevention of back pain and other musculoskeletal injuries is important for student's current wellbeing and long term health³. Most children are required to carry heavy school bags to and from school each day, and the load increases as they reach higher grades. Sports clothing and equipment often adds another bag to their load. The wide range of school bag weight may explain that some school girls bring more items than necessary to take to school. This study reported that increased school bag weight is associated with the increase risk of back pain problems, the results of the study are inconsistent with Mohseni-bandpei⁴ who found no association between school bag weight and risk of low back pain. The explanation for conflicting results may be due to heavier bags carried by the students in this study. Perception of the pain (pie chart) shows that few girls complain of severe pain as 5.5% reported 80-100 i.e., every pain and 7.34% complained 100% being unbearably painful. However, most girls 24.77% checked 0-20 on questionnaire and 25.69% say 20-40 which suggest that they are comfortable with their school bags. The only logical explanation for this can be that they have been carrying such heavy bags for a long time and now they are used to it. This finding agree with other study that report the weight of the average backpack is heavier, proportionally, than the legal load-bearing limit for adults⁵.

CONCLUSION

Children's Health and Healthy Children advise a proper fit and lightening the load. Leave out any items your child does not absolutely need for that day, such as laptops or other electronic devices, extra books or notepads. Also ensure that children bring only important items that they needs for that night's homework. While at school, urge your child to use his locker, desk or other storage areas so he doesn't have to cart around so much stuff. Awareness should be created among health care professionals, teachers, parents to restrict backpack load less than 5% of bodyweight by using school locker shelves. Improper use of backpacks is not healthy for anyone, especially for children who are more susceptible to injury because their bodies are growing and developing. Students, staff, and families need to be educated about backpacks' contribution to back pain and taught appropriate interventions to reduce injury.

RECOMMENDATIONS

Backpacks should not heavier than 10-15% of the children's body weight when packed. Make sure that backpack is light in weight sturdy and sized-matched to the children. Always choose a backpack with wide and well-padded shoulder straps and with padding at the rear of the backpack where comes into contact with the back and shoulders. Always remember that the shoulder straps should be adjustable. Use both shoulder straps-never slung the pack over one shoulder and use hip straps if available. Don't carry the backpack low on the back - A study of 10 healthy children age 12-14 showed that those who carried the backpack low on the back, created more the pressure on the back and shoulders when wearing it properly positioned high on the back. Backpack should balance the Load. It should be designed like to carry, balanced, stable and symmetrical load held close to the spine. Show your child the correct way to put on the backpack and wear it properly. Parents should make sure that children pack their backpack properly. The various items should be secure and not move around the back. Backpack should have many compartments so the children can put heaviest item in the largest compartments near the body. If a well-designed bag is positioned correctly on the back, abdominal muscles can support the weight of the backpack. If the weight is not too heavy, it should evenly spread over the body and can be supported comfortably without any back problems.

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