

Assessing the Effect of Postural Discomfort on School Going Children Due to Heavy Backpacks

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Abstract

In this era, this is very new concern regarding weight of the children carrying heavy school bag. There are many negative consequences, such as heavy load on the developing spine and discomfort. Backpack leads to the development on back pain and other postural injuries. These problems associated with backpack use and have become increasing concern with school children. In this study 300 children were selected randomly for their personal information and postural discomfort was access through interview schedule along with body discomfort chart. Most of the student reported the occurrence of sharp radiating and pins & needle type pain; neck, shoulder, upper back, lower back, leg, knee found sharp pain in male 57.9% while in female 56.6%, whereas in arms, finger, toes, radiating in male 36.6% and in female 39.7% and 41.5%, in male and 45.6% in female pins and needles pain was found in both gender respectively. There was no significant difference of postural discomfort in neck, shoulder, arms, finger, leg, knees and toes but in the upper back and lower back same discomfort found due to heavy backpacks. The result indicated prevalence of postural discomfort high in both gender. Preventive points should be taken while carrying backpacks.

Keywords: Posture; School children; Discomfort; Backpack

Introduction

Posture can be defined as the position of all the body segments observed at a specific moment. Adequate posture occurs when the body is kept in balance with the least expenditure of energy possible. Carrying a heavy backpack can be a source of chronic strain; and can cause shoulder, neck and back pain in children [1]. Backpacks can cause pain in the head, neck or face, as well as the hands, the wrists, the elbows, the shoulders, the feet and the ankles. A badly worn backpack can change posture and gait when walking and this compound the problems [2]. There is a positive relationship between change in the posture during carrying the backpack and changes of trunk position and motion range due to the load being carried which might influence the response of respiration. Children carrying heavy loads have to bend their trunks forward to maintain body posture and balance while walking [3].

Postural discomfort encompasses a lot more than a static pose. It is the result of chronic bad habits as we perform daily activities. Particularly, if we consistently engage in repetitive motions, or maintain a position for prolonged period, our body begins to compensate for the activity. This throws the rest of the body out of alignment. Postural discomfort is a condition where pain is felt in the lower back, however, there is no significant damage or trauma to tissue. Patients with postural discomfort only experience an ache or pain during activities placing sustained stress on normal tissue [4].

Overloaded school bags that are up to double the size of those carried ten years ago are contributing to the surge, it is feared. 'Children's skeletons are still growing so carrying heavy bags can cause lasting damage. 'Many are carrying their bags on one shoulder or arm

increasingly carrying them on the crook of their elbow, so are placing a great strain on the spine [5].

The study showed that level of physical stress was severe in 12-13 years children that was (n=60) 56.66 percent where as children of 10-11 years age faced maximum physical stress (n=40) 42.5 percent. Most of the children reported the occurrence of shoulder pain, back pain, neck pain red marks on shoulder, muscle spam among school children. The results indicated a high prevalence of physical problems among elementary school children [6].

Due to the recent popularity of the subject of children and backpacks, additional research in this area would only strengthen the understanding of the problem. There has been growing concern among health care professionals, parents and educators that backpacks are damaging the posture/back and this study will also help them to identify the problem regarding backpack carried by the school children and necessity to take important measures in this issue. Many authors that have addressed physiological measurements while using a backpack state facts on children and backpack. So the aim of the study was felt on provide the information about effect of postural discomfort on school going children due to heavy backpacks.

Materials and Methods

Descriptive cum experimental and simple random sampling method use for selecting respondents. A total of 300 children from ICSC, CBSC, and UP board school, aged between 10 to 13 years from the class V to VIII from Lucknow city. The data was collected from their homes. Informed consent was obtained from the children and their parents. In this session the children were given a self-made interview schedule. The interview schedule consist personal details like name, age, class, board, distance of school, mode of transportation, physical characteristics like height, weight and bag weight. The daily

reported discomfort was recorded on a Body Discomfort Chart (BDC). The subject weight was measured with a weighing scale. Standard height was measured with measuring tape secured to the wall. The school bag was also weighed.

Results and Discussion

S No.	Age of the respondents	Male (N=164)	Female (N=136)
1	41923	85 (51.8)	72 (52.9)
2	41986	80 (48.7)	64 (47.0)

Table 1: Distribution of table according to gender. (Figures in parentheses indicates percentage)

Table 1 showed that 51.8 percent male and 52.9 percent female respondents were belonging to age group 10-11 years. Whereas 48.7 percent male and 47 percent female respondents were belonging to age group 12-13 years.

S.No	Body Discomfort	Boys (N=164)				Girls (N=136)			
		Dull	Sharp	Radiating	Pins & Needle	Dull	Sharp	Radiating	Pins & Needle
1	Neck	38(23.2)	66(40.2)	44(26.8)	16(9.8)	32(23.5)	45(33.1)	42(30.9)	17(12.5)
2	Shoulder	44(26.8)	63(38.4)	40(24.4)	17(10.4)	33(24.3)	56(41.2)	31(22.8)	16(11.8)
3	Arm	38(23.2)	51(31.1)	60(36.6)	15(9.1)	28(20.6)	43(31.6)	54(39.7)	11(8.1)
4	Finger	31(18.9)	22(13.4)	55(33.5)	56(34.1)	29(21.3)	23(16.9)	35(25.7)	49(36.0)
5	Upper back	33(20.1)	72(43.9)	45(27.4)	14(8.5)	26(19.1)	51(37.5)	39(28.7)	20(14.7)
6	Lower back	33(20.1)	72(43.9)	45(27.4)	14(8.5)	26(19.1)	51(37.5)	39(28.7)	20(14.7)
7	Leg	15(9.1)	95(57.9)	37(22.6)	17(10.4)	12(8.8)	77(56.6)	38(27.9)	9(6.6)
8	Knees	33(20.1)	65(39.6)	60(36.6)	6(3.7)	34(25.0)	58(42.6)	42(30.9)	2(1.5)
9	Toes	13(7.9)	24(14.6)	59(36.0)	68(41.5)	9(6.6)	16(11.8)	49(36.0)	62(45.6)

Table 2: Distribution of respondents on the basis of postural discomfort. (Figures in parentheses indicates percentage)

NS- Non Significant

It is evident from the table even though significant differences were not found across gender for all the parameters. A study conducted on population based cross-sectional study in 1446 children aged 11 to 14 years in the using a self-complete modified Hanover questionnaire to assess low back pain prevalence, symptom characteristics, associated disability and health seeking behavior. The one month period prevalence was 24% with girls higher than boys (29 VS 19%; $X^2 = 14.7$, $P < 0.001$) and increased with aged in both sexes ($P < 0.001$) of those reporting low back pain 94% experienced some disability with the most common reports being of difficulty in carrying school bags. But only few sought medical attention [8].

Conclusion

The aim of this study was to investigate the effects of postural discomfort on school children due to heavy school backpack. The findings of the present study provide additional information about the use of school bags and postural problems among school children. The

Postural discomfort among school children

Table 2 explains the body discomfort among school children according to their gender. 40.2% male and 33.1% female felt sharp pain in neck, while 38.4% male and 39.7% female were felt sharp pain in shoulder. In arms 36.6% male and 39% female respondents reported radiating pain, whereas in upper lower back 43.9% male and 37.5% female felt sharp pain. 57.9% male and 56.6% female felt sharp pain in leg while 39.6% male and 42.6 % female were felt sharp pain in knees also but in toes 41.5% male and 45.6% in female complained pins and needles pain.

The result are at par with the results shown by [7] also states in pilot survey to investigate the incidence of low back pain in 200 school children using a questionnaire aimed at eliciting information about physical characteristics, the prevalence, severity and aggravating factors of reported low back pain was 41.5% with equal number of males and females as shown in Table 3.

results indicated that the prevalence of postural complaints among school children was considerably high. This suggests the need for preventive measures and appropriate guidelines with regard to safe load carriage in schoolchildren to protect this age group. It was shown that children were more likely to complaint from postural problems.

In addition, individual factors including age, gender and body discomfort was shown to be associated with the presence of postural problems in different body regions. Children would know the proper ways to load their backpacks to prevent back pain and, on the rare occasion they would still experience back pain, they would be able to recognize it and learn to voice their problems to their parents and teachers. The parents and teachers, in turn, would be more aware of such problems faced by the students. Once aware, they would know to take further steps to prevent back pain, such as decreasing the amount of weight carried by the students and/or buying more comfortable backpacks. In this study we found both gender are affected with carrying heavy backpacks as shown in Figure 1. Risk factors for postural discomfort associated with schoolbag carriage include the combined effects of heavy loads, load shape and size, time spent

carrying the load and position of the load on the body by addressing all these criteria it is possible to make a solution to this problem.

S.No	Postural Discomfort	Male		Female		T value	P value
		Mean	S.D.	Mean	S.D.		
1	Neck	2.23	0.917	2.32	0.973	0.84	0.4
2	Shoulder	2.18	0.948	2.22	0.948	0.342	0.73
3	Arm	2.32	0.932	2.35	0.889	0.337	0.73
4	Finger	2.83	1.1	2.76	1.156	0.494	0.62
5	Upper back	2.24	0.873	2.93	0.96	1.1376	0.17
6	Lower Back	2.24	0.873	2.93	0.96	1.1376	0.17
7	Legs	2.34	0.787	2.32	0.729	0.203	0.83
8	Knees	2.24	0.813	2.09	0.784	1.612	0.1
9	Toes	3.11	0.933	3.21	0.895	0.904	0.36

Table 3: Assessment of postural discomfort among school children across genders.

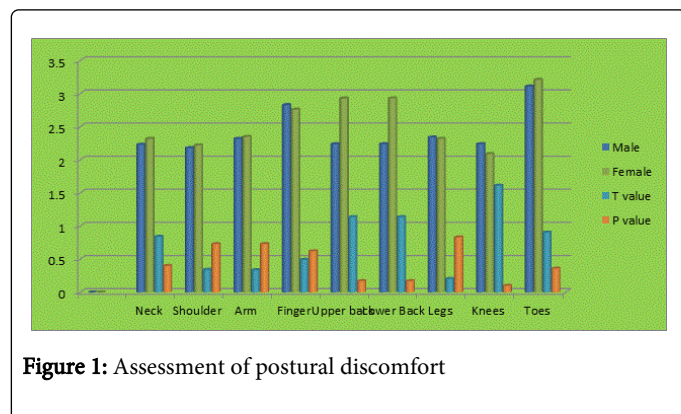


Figure 1: Assessment of postural discomfort

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