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Effect of Postural Discomfort on School Going Children Carrying 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 children reported the occurrence of sharp radiating and pins & needle type pain; neck, shoulder, upper back, lower back, leg, knee irrespective of gender. 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.

1. 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. (Rai and Agarwal, 2013) reported that backpacks can cause pain in the head, neck or face, as well as hands, wrists, elbows, shoulders, feet and ankles. A badly worn backpack can change posture and gait when walking and this compounds the problems. (Singh and Koh 2009) 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. (Rai and Agarwal, 2013)

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. ((Lockhart et al. 2004)
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 children 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. (Mackie et al. 2003)

A study conducted by (Rai &Agarwal 2014) 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.

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 to know the effect of postural discomfort on school going children due to heavy backpacks.

Material and Methods: The research design for the study was exploratory cum experimental in nature 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 were selected. Self constructed and pre-tested interview schedule was used to collect general and specific information for children. Informed consent was obtained from the children and their parents. The daily reported discomfort was recorded on a Body Discomfort Chart (BDC).

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2. Results and Discussion

Data showed in the table 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 47.0 percent female respondents were belonging to age group 12-13 years.

Table 1: Distribution of respondents according to gender

S No.	*Age of the respondents*	*Male (N=164)*	*Female (N=136)*
1.	10-11	85 (51.8)	72 (52.9)
2.	12-13	80 (48.7)	64 (47.0)

(Figures in Parentheses Indicates Percentage)

Data reported in table explains the type of body discomfort among school children according to their gender. Data showed that 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, where as 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 were found at par with the results shown by (Kathleen et al 2000), but author by (Fuller et al., 2006) result were found contradictory studies showed A total 69.69% ($p<0.05$) of the pupils complained of sharp (36.36%), radiating (11.11%), pins and needles (22.22%) sensations whilst 30.30% ($p<0.05$) of the pupils who carried backpack type schoolbags reported dull aching pain. These pupils indicated the intensity – see table 3, of the musculoskeletal pain experienced, as follows: uncomfortable (36.17%) followed by manageable (28.72%), moderate (25.53%), severe (5.32%) and unbearable (4.23) ($p<0.0001$). The pupils could not report on the prevalence of musculoskeletal injuries due to the fact that these claims of musculoskeletal injuries could not be substantiated by medical records; however the pupils identification of types of musculoskeletal pain (such as dull aching, radiating, sharp shooting, and pins and needles), intensity of pain.

Table 1.1.2: Distribution of respondents on the basis of type of body discomfort

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)**

(Figures in parentheses indicates percentage)

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Table No.1.3 Assessment of postural discomfort among school children across genders.

Ho: - There exist no significant differences between gender and postural discomfort.

It was evident from the table no3 that there were no significant differences found across gender for all the parameters. This means that all respondents complained of postural discomfort in parts of the body irrespective of gender.

S.No	Postural Discomfort	Male		Female		T value	P value
		Mean	S.D.	Mean	S.D.		
1.	Neck	2.23	.917	2.32	.973	.840	.40
2.	Shoulder	2.18	.948	2.22	.948	.342	.73
3.	Arm	2.32	.932	2.35	.889	.337	.73
4.	Finger	2.83	1.100	2.76	1.156	.494	.62
5.	Upper back	2.24	.873	2.93	.960	1.1376	.17
6.	Lower Back	2.24	.873	2.93	.960	1.1376	.17
7.	Legs	2.34	.787	2.32	.729	.203	.83
8.	Knees	2.24	.813	2.09	.784	1.612	.10
9.	Toes	3.11	.933	3.21	.895	.904	.36

NS- Non Significant

3. Conclusion

Posture is usually defined as the relative arrangement of the parts of the body.. Postural faults can give rise to discomfort, pain or disability. The range of effect from discomfort to incapacitating disability is related to the severity and persistence of the faults. The findings of the present study provide additional information about the use of school bags and postural problems among school children. The results indicated that the prevalence of postural complaints among school children. This suggests the need for preventive measures and appropriate guidelines with regard to safe load carriage in schoolchildren to protect this age group. This is seen in both genders. 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. 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.

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