Effect of Weight of Backpack and Physiological Stress among School going Children

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Abstract:-

Some children may seem to literally carry the world on their shoulders in their heavy backpacks. This study focuses on to check the physiological stress due to heavy weight of backpack carried by children. Total numbers of 300 children from ICSC, CBSC and UP board, aged between 10-13 years from the class V to VIII from Lucknow city were selected. Their personal and physiological stress was assessed through pre tested interview schedule. Most of the children reported occurrence of pain. The value was higher than 0.05 level of significant so there was found no significant differences bag weight and physiological stress due to carrying heavy backpacks. The results indicate prevalence of physiological stress high in both genders. Young children suffering from pain much earlier than previous generation and the use of overweight backpack is contributing factor.

Key words:
Physiological stress; School Children; Weight of backpack

Introduction

Students of all levels, carry a schoolbag packed with textbook, notebooks, library books, geometrical and mathematic instruments, snacks boxes, lunch packs and water bottles and so on. The backpack is one of the several forms of manual load carriage that provides versatility and often used by hikers' backpackers, soldiers, as well as by school children. The backpack is an appropriate way to load the spine closely and symmetrically, while maintaining stability.

(Negrini Carobalona2002). Today's heavy loads are causing injuries that last a lifetime. If children are feeling headache, neck ache, bad posture, achy and strained muscles, low back pain, muscle spasm, tingling hands, and increased scoliosis complications, it may be because of carrying too much weight improperly. . (Rai and Agarwal,2013) reported that backpacks can cause pain in the head, neck, as well as hands, wrists, elbows, shoulders, feet and ankles. Schoolchildren everywhere are being asked to carry more and more weight around on their backs. There are many reasons why children have to load up their backpacks, including schools that don't use lockers, increased levels of homework, and greater use of laptops and other electronic gear. Backpacks filled with heavy textbooks, notebooks, laptop computers, and class projects are more than just an annoyance, and they can cause injury. Children carrying heavy loads have to bend their trunks forward to maintain body posture and balance while walking. (Rai and Agarwal,2013)

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, and 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.

To study the physiological stress of school children carrying heavy back packs, the present study has been taken to arouse attention and concerns of people towards the very sensitive and very prominent matter of heavy school bags carried by children. (Singh, & Koh,2009) reported that the improper use of backpacks can lead to muscle imbalance that could turn into chronic back and neck problems. Thousands of children are injured each year by backpacks that are too heavy or repetitive stress injuries. It is high time that in India we have to gather information regarding the weight carried by the school.

Material and Methods: The research design for the study was exploratory cum descriptive in nature and simple random sampling method was use for selecting respondents. A total of 300 children from ICSC, CBSC, and UP board school, aged between 10 to 13 years from class V to VIII from Lucknow city were selected. Self constructed and pre-tested interview schedule was used to collect general and specific information from children.

Results and Discussion:

The table no 1 depicted that 29.2% boys respondents in the age group 10-11 years were carrying more backpack weight, 34.5% girls respondents in the age group 10-11 years had more backpack weight. 14% boy's respondents in the age group 10-11 and 8.8% girls were carrying equal weight of backpack only few respondents 7.9% in boys, 9.5% in girls were carrying less weight of backpack than recommended backpack weight. It was noted that 33.5% from the age group 12-13 in boys and 32.3% in girls were using more weight than recommended weight of backpack, whereas 77.9% in boys and 9.5% in girls in the age group 12-13 using equal weight of backpack. Some of boys and girls 7.3% and 5.1% respectively carry less backpack weight that the recommended backpack weight.

Table No: 1 Distribution of respondents according to weight of backpack carried compared with recommended backpack weight.

S. No.	Component	Recommended weight in kg	Actual backpack carrying More/ less BP wgt.		
1.	**Boys N=164**		**More (F %)**	**Less (F %)**	**Equal (F %)**
	10-11	3.0 kg	48 (29.2)	13 (7.9)	23 (14.0)
	12-13	4.0 kg	55 (33.5)	12 (7.3)	13 (7.9)
2.	**Girls N=136**				
	10-11	3.3 kg	47 (34.5)	13 (9.5)	12 (8.8)
	12-13	4.4 kg	44 (32.3)	7 (5.1)	13 (9.5)

The table no 2 explains that the physiological stress in school children due to heavy backpacks. It was revealed that most of the respondents 61% boys and girls had frequently pain in spinal cord, while approximately 91.5% in both gender had never back injuries. Most of the respondent's 47.6% boys and 57.4% girls had frequently backaches, while 48.2% boys and 44.1% girls had frequently muscle spams. About 52.4% boys and44.1% girls had frequently shoulder pain. It was noted that 59.1% boys and 48.5%

girls had frequently neck pain due to heavy backpacks.

Most of the respondent's 56.7% boys and 62.5% girls had frequently irritation, while highest percentage in boys' 69.5% and 66.7% girls had frequently fatigue due to heavy backpacks. It was evident that 78% boys and 77.9% girls were found never deformed body posture. 32.9% boys and 58.1% girls were frequently suffering from headache while 57.3% boys and 66.9% girls had frequently red marks on shoulder due to loaded backpack, where as 52.4% boys and 47.85 girls had frequently tingling and numbness in their arms.

Table No: 2 Distribution of respondents according to the physiological stress faced by school going children.

S.No.	Gender					
	Physiological problems	Male (N=164)			Female (N=136)		
		Sometimes	Frequently	Never	Sometimes	Frequently	Never
1.	Pain in spinal cord	32 (19.5)	100(61.0)	32 (19.5)	31 (22.8)	82 (60.3)	23(16.9)
2.	Back injuries	14 (8.5)	-	150(91.5)	12 (8.8)	-	124 (91. 2)
3.	Backaches	67 (40.9)	78 (47.6)	19 (11.6)	41 (30.1)	78 (57.4)	17 (12. 5)
4.	Musclspams	50 (30.5)	79 (48.2)	35 (21.3)	41 (30.1)	60 (44.1)	35 (25. 7)
5.	Shoulder pain	56 (34.1)	86 (52.4)	22 (13.4)	47 (34.6)	69 (50.7)	20 (14. 7)
6.	Neck pain	51 (31.1)	97 (59.1)	16 (9.8)	53 (39.0)	66 (48.5)	17 (12. 5)
7.	Irritation	63 (38.4)	93 (56.7)	8 (4.9)	46 (33.8)	85 (62.5)	5 (3.7)
8.	Fatigue	42 (25.6)	114(69.5)	8 (4.9)	38 (27.9)	90 (66.2)	8 (5.9)
9.	Deformed body posture	22 (13.4)	14 (8.5)	128(78.0)	24 (17.6)	6 (4.4)	106 (77. 9)
10.	Headache	53 (22.3)	54 (32.9)	5 (3.0)	54 (39.7)	79 (58.1)	3 (2.2)
11.	Red marks on shoulder	61 (37.2)	94 (57.3)	9 (5.5)	33 (24.3)	91 (66.9)	12 (8.8)

12.	**Tingling &numbness on arms**	55 (33.5)	86 (52.4)	23 (14.0)	49 (36.0)	65 (47.8)	22 (16.2)

(Figures in parentheses indicates percentage)

H1: - There exist no significant differences between bag weight and physiological stress.

The table no 3 reported that the p value of the table was higher than 0.05 level of significant which showed that the null hypothesis was accepted and there was no significant differences between comparison of backpack weight and recommended backpack weight and physiological stress due to carrying heavy backpacks. The result were found contradictory with the results shown by (**Wiersema *et al.*, 2003)** who found that children who carried a school bag that is more than 20% of their body weight were at an increased risk of (LBP) Low Back Pain ; therefore, requiring a visit to a physician .

Table No: 3 Assessment of physiological stress among school children due to bag weight.

BACKPACK WEIGHT									
S.No	**Physiological stress**	**Equal no=61**		**More no=194**		**Less no= 45**		**F value**	**P value**
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**		
1.	Pain In Spinal Cord	1.52	.744	1.41	.792	1.33	.798	.826	.439
2.	Back Injuries	.10	.300	.08	.276	.09	.288	.075	.928
3.	Backaches	1.36	.775	1.38	.682	1.53	.625	.998	.370
4.	Muscle Spams	1.31	.847	1.20	.779	1.24	.857	.445	.641
5.	Shoulder Pain	1.30	.782	1.41	.702	1.33	.707	.713	.491
6.	Neck Pain	1.48	.673	1.46	.668	1.24	.743	2.04	.132
7.	Irritation	1.51	.595	1.55	.585	1.60	.539	.32	.722
8.	Fatigue	1.61	.640	1.62	.574	1.67	.564	.143	.867
9.	Deformed Body Posture	.28	.662	.29	.557	.29	.589	.007	.993
10.	Headaches	1.54	.594	1.61	.568	1.69	.468	.907	.405
11.	Red Marks On Shoulder	1.48	.648	1.58	.608	1.51	.661	.704	.495
12.	Tingling Or Numbness On Arm	1.31	.743	1.39	.720	1.27	.751	.620	.538

NS- Non Significant

Conclusion

The backpack had its impact on the school children, especially on their physical growth and development. It is mainly because of the syllabus pattern, and extra load in the form of accessories like sports kit, musical instruments, laptop, lunch and projects etc. It is high time to make a safety guideline to avoid any complication out of backpack.

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