
IMPACT OF HEAVY SCHOOL BAGS ON PHYSICAL HEALTH OF SCHOOL GOING CHILDREN: A CASE STUDY OF PRIMARY LEVEL SCHOOLS OF DISTRICT LASBELA, PAKISTAN

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ABSTRACT

Growing global attention has centered on the role of school bags in the creation of low back pain in school going children and adolescents. The aim of this study is to find out the association of heavy school bags and incidence of physical pain in children in private schools of primary level students in district Lasbela, Pakistan. The study data was collected from the 120 students and 20 teachers through interviews and distributing questionnaires. The study employed frequency distribution, data visualization, descriptive statistics, chi-square test and ANOVA. It is found that there is a significant association between heavy school bags and occurrence of physical pain (such as neck, shoulders, back pain). The results also confirmed that the mode of carrying school bags and occurrence of physical pain are independent. The study also has found that there is significance association between mode of transportation to school and with the occurrence of physical pain in children. This study recommends that the policy makers need adopt policies that can resolve the heavy school bags contributing aspects to cause back pain. The policy makers such as educationists and

health individuals must adopt policies to report and resolve this problem as the heavy school bags are also contributing aspects to cause musculoskeletal pain and physical pain that is major burden towards kid's physical as well as mental growth.

KEYWORDS

Backpain, Heavy School Bags, Education, Lasbela, Pakistan

INTRODUCTION

The connection between school backpacks and the development of low back pain in school-age children and adolescents is receiving increasing attention on a global scale. Children who attend school are increasingly carrying a bag. Around the world, more than 90% of children are currently seen carrying a backpack (Alami et al., 2020; Sheir-Neiss et al., 2003). Low back pain is linked to carrying schoolbags in kids and teenagers (Dockrell et al., 2015; Fabricant et al., 2020; Jones, 2005). Back discomfort in school-aged children and adolescents has been noted as a global issue that is getting worse (Drza-Grabiec et al., 2015; Fabricant et al., 2020; Sheir-Neiss et al., 2003). According to a number of studies (Alami et al., 2020; Chow et al., 2009; Dockrell et al., 2015; Drza-Grabiec et al., 2015; Perrone et al., 2018; Sheir-Neiss et al., 2003), wearing more than 15-20% of a child's body weight increases the risk of spinal pain, posture and gait disorders, musculoskeletal injury risk A large percentage of kids carry bags that are heavier than is healthy for their body weight (Abaraogu, Kizito, Okafor, & Okoye, 2016; Chow, Ou, Wang, & Lai, 2010; Sheir-Neiss et al., 2003).

Explicit questions concerning back discomfort were asked of participants in a small study on pain caused by school bags in elementary school students (Dockrell et al., 2015). To my knowledge, no studies have been done that particularly address the issue of children in Balochistan's district Lasbela carrying large school backpacks. Therefore, the primary goal of this study was to explore the relationship between musculoskeletal pain and schoolchildren's heavy backpacks. Additionally, to develop solutions for their large schoolbags' weight, to raise awareness of the issue and recommend actions that should be made to lessen the long-term negative impacts on children from carrying heavy bags. The presented study contributes to explore the health problems due heavy bags among children of primary level in private schools in District Lasbela. Based on time and constraints the study will figure out the health-related problems because of the said issue and the result have greater importance to get hand on the increasing health issues among the school children in growing stage.

LITERATURE REVIEW

The Education situation in District Lasbela is not very dissimilar from education state in other regions in Balochistan. The education division in the district Lasbela contains of public and private institutes with variable superiority. About 564 schools are

functioned by the public subdivision which cover primary to middle, high and high secondary schools. Approximately eighty seven percent of these institutes are in rural zones and 13 percent in urban parts (Lasbela Education Plan 2016-17 to 2021-22). Literature review of the study to explore the previous literature on the topic to determine the perception of research community. School bag is one of the several forms of manual load carriage used by school children. School going children use bags to carry their books, copies, materials, lunchbox etc. Children regularly carry weight between 10 to 40 kg on their shoulders while going to school. (Keeta *et al.*, 2002). Pupils in junior classes are carrying heavy school bags which can cause severe health issues. Study find out that mostly school children carry school bags about 15% of their body weight which can cause severe physical issues in future. Even though pain in lower back is not a deadly disorder, it is a main source of nonappearance from labor as well as damage of productivity, furthermore to simple consequences on the quality of lifespan (Mohammadi *et.al.*, 2017 and Duenas M, *et.al.*, 2016).

In Lahore, Pakistan, a descriptive study was carried out on both public and private institutions, using a sample drawn using non-probability sampling. The goal of this study was to determine the prevalence of low back pain caused by heavy school bags among students in Lahore. The study found that 69 percent of students reported experiencing back and shoulder pain, even though only 18.2 percent of students reported experiencing low back pain. Shoulder pain was recorded at 38.8 percent of students, and upper back pain at 11.8 percent. the recommendation of physiotherapist Dr. Zubair Patel that children should only carry up to 10% of their body weight. He may experience a variety of issues, like an erect head position, back and shoulder soreness, etc., when he carries a bag heavier than his own body weight. (Afzal *et. al.*, (2015) and Saraswat in (2013)).

Various research concluded that students who considerate their college bags to be weighty are more expected to have low back ache than other students. In a like study that measured the real faculty bag mass and the supposed weight of college bag, the plain weight of school bag (however the definite bag mass) turned into meaningfully associated with low lower back ache. Load of college bags, measured as a ratio of body heaviness, changed into actual in guessing ache in back with woman pupils are more expected to account pain in lower back. Some students resolved the similar results and stated that pain in neck, shoulders and returned were related to heavy school luggage. (Shamsoddini A, *et.al.*,(2010), Bauer and AlQalaf,2011, Farhood H .(2013) and Ramprasad M ,*et.al.*,(2010))

If school going children carry weight more than 10% of their body it can affect their lung volumes and respiratory system (Chansirinukor *et.al.*, 2001). According to Keeta *et al.*, (2002) the causes of risks due to heavy school bags reasons behind risk which

may affect on physical health of children include. If School bag weight increased more than 10% of the body weight of children. If children carry bag improperly on one shoulder or hold the bag only by its straps with hand. Imperfectly fitted packed of school bags etc. (Shahid et.al., 2018) selected 115 students of 9 to 13 years old through systematic random sampling from 5th and 6th grade in secondary schools of Karachi. They reported that shoulder occurrence of musculoskeletal problems is rapidly increasing and prevalence of shoulders pain was common in school going children as a result of carrying heavy bags which may lead to change posture of body.

As well as, (Khanzada, 2016) conducted a study to investigate the prevalence of backache among children of school going age in Hyderabad Sindh. They concluded there is a significant association between carrying heavy bags and backache. Link low back pain related to heavy school bags, (Afzal, Asim, & Dilshad, 2013) studied about the impact of overloaded bags on physical health of children. They collected a sample of 165 students from public and private schools of 5th to 7th class from district Lahore with non-probability purposive sampling. They concluded that heavy school bags can cause physical pain such as back pain, shoulders and neck pain if not be carried properly. Further, (Kabilmiharbi & Santhirasegaram, 2016) conduct a study in Malaysia to find out the association of heavy school bags and occurrence of neck and back pain in children of primary school in Shah Alam, Selangor and result exposed that due to heavy school bags, improper mode and time duration of carrying bags occurrence of neck and pain were happen nearly in 90 students.

The mode of carrying school bags can also cause pain, while this remains debated. *Rice et al.*, (2008) also stated that 50% students who carried school bags one shoulder complaint pain twice from those students who carried school bag on two shoulders equally. Irregular mode of carrying school bags only one shoulder caused superior ache in children. A cross sectional study also investigated the connection of backbone pain with standing or walking attitude. Standing position or walking attitude while carrying heavy load is associated with backbone pain (Mikkelsen *et al.*, 1997). Link between heavy school bag and heart rate /blood pressure, (Hong, Li, Wong, & Robinson, 2000) conducted the study in Hongkong on belongings of heavy school bags on 10 years school children heart frequency, energy disbursement. The result revealed that to carry heavy school bag can increased the heart rate of children and become reason of fatigue and increased blood pressure. Specialists suggested children can carry school bag more than 10% of their own body weight.

RESEARCH OBJECTIVES

1. To determine the impact of heavy school bags on children's health.
2. To investigate the relationship between child health and mode of transportation to school.

RESEARCH HYPOTHESIS

1. There is no significance association between modes of carrying heavy school bags with occurrence of physical pain in children.
2. There is no significance association between transportation/mode to go to school occurrence of physical pain and tiredness in school going children.

RESEARCH METHODOLOGY**Research Design**

This is an Action Research and nature of this research is mixed method design both Qualitative and Quantitative due to broadness of study. Study is directed on girls and boys of primary level private school going children of District Lasbela Balochistan. Including four urban areas i.e. Hub, Vindar, Uthal and Bela. Children were weighted with and without carrying their school bags also the discomfort was noted in the primary private schools of district Lasbela.

Sample Size and Participant

District Lasbela has large amount of Government and Private Schools. The research sample included different private schools, size, type (boys and girls), socio-economic and geographical were selected. All Primary level student's 1st to 5th class's students 6 to 11-year ages and teachers of selected for this study. The study sample is drawn from the population using convenient sampling of non-probability sampling techniques Ahrens et.al. (1987). The sample of 120 participants is composed of 100 students and 20 teachers. Following research instruments was used for data collection such as questionnaires and interviews for students and teachers to know the impact of heavy school bags on physical health of school going children. If some students who unable to carry school bags or who cannot stand were excluded from sampling.

Empirical Analysis

Reliability and validity of records for research gadgets which includes questionnaire pilot testing is finished to test the validity of the facts George and Mallery (2003), Gliem, (2003). Data changed into based on questionnaires and interviews which had been crammed with the aid of students and instructors. Before amassing facts on the day, a brief consultation changed into given to the player of college students and instructors on how to fill the questionnaire. All the items within each aspect have Cronbach's Alpha more than 0.7. The reliability analysis shows that the size is used to measures those variables inside the records is dependable. The records in this form is suitable and may be used in in addition evaluation.

Furthermore, descriptive, and inferential statistics have been used for empirical analysis to find out the impact of heavy school bags on children's health. In descriptive statistics simply frequencies and percentages have been found. For hypothesis testing

Analysis of variance (ANOVA) and Chi-Square Distribution Test have been used in the study.

FINDINGS

Section I: Item by Item Analysis (Students Data Analysis)

Table 4.1: Descriptive Statistics of Study Measures

Variables	Minimum	Maximum	Mean	Std. Deviation
Student's Age	6	16	10.66	1.913
Student's Height	42	63	52.3	4.56269
Student's Body weight	16	39	32.66	9.88849
Student's Bag weight	3	7	4.26	0.99107
Student's weight with bag	21	97	36.92	10.13114

The table 1.1 describe the results of descriptive statistics. Total 100 participants among them 58 are male and 42 are female students. The minimum age of a student is 6 year and maximum age 16-year-old. The average height of students 52.3 and the average of body weight of the student's 32.66. The average of body weight with school bag 36.92 in primary school students.

Distribution of the Students According to their Behavior Related to School Bag

Different questions have been requested via college students for preceding scientific problem together with fracture or surgical operation confronted by college students, sixty seven% students respond they did now not face any fracture or surgical operation whilst 33% answered they get fracture. For lockers all of one hundred college students responded they do now not have lockers in their colleges. When they were requested, do your determine's assist you carry your faculty luggage all of one hundred students answered no they do now not take their dad and mom assist bring our faculties. Distribution of students use shipping to arrive to school, Approximately 77% college students reply that they walk to high school, among of them nine% use car rickshaw , 6% use motorbike ,4% college students use bus , from them three% students use car and best 1% use bicycle .

Distribution of Students According to the Mode they Carry School Bag, almost fifty five% reply that they bring bag on two shoulders alternatively forty four% replied they create college bag on one shoulder and most effective 1% answers they convey books and faculty luggage via two palms. Distribution of time taken through college students to get to high school, almost forty four% students take 5 to 10 mins to get to highschool, eleven to 15 mins are taken by way of 19% students and 10% college students take sixteen to 30 minutes take to journey from home to school at the same time as carrying the faculty bag. Further, 18% responds they take much less than 5 mins and simplest 9% students spoke back they take extra than half-hour to attain college. Distribution

of occurrence of pain area, huge proportion of students forty two% criticism they sense ache in shoulders, for neck ache 21% students grievance, almost 11% college students reply incidence of ache in fingers, about 8% students reply the occurrence of pain in center and higher returned ache and seven% students experience ache in decrease lower back and just 3% college students replied the texture headache and only 1% grievance ache in chest vicinity.

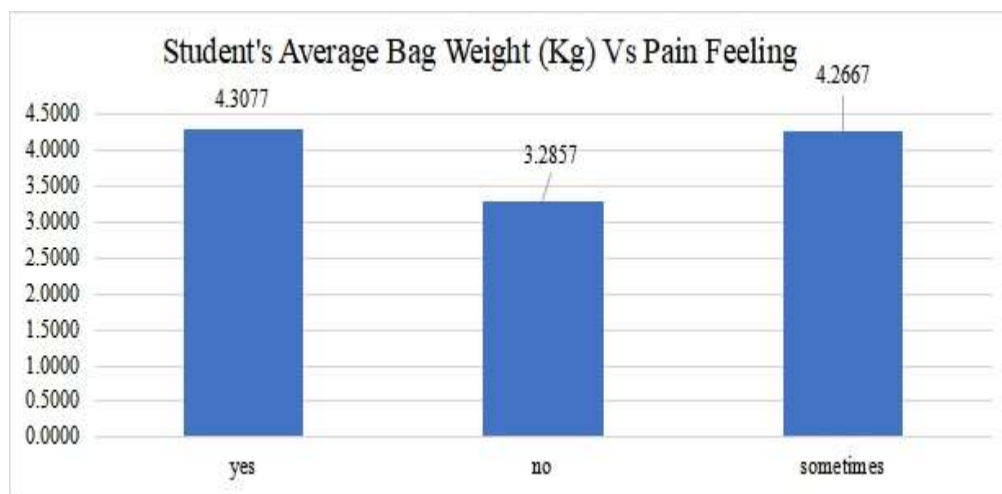
Testing of Hypothesis

There is no association between weight of carrying heavy school bags and occurrence of physical pain in children

Table 4.2: Analysis of Variance (ANOVA)

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	6.733	2	3.366	3.438	0.036
Within Groups	94.977	97	0.979		
Total	101.710	99			

The p-value indicate that we can reject the null hypothesis as the significance value of the test 0.036 which is less than 0.05. Hence, concluded that there is a significant association between heavy school bags and occurrence of physical pain (such as neck, shoulders, back pain).



The average bag weight of students is 4.3077 kg as presented in **Figure.3.1** and they are feeling pain. The average bag weight of students is 3.2857 who did not report about pain feeling. The average bag weight of the students feeling pain sometime is 4.2667 kg.

Figure 3.1: Student's Average Bag Weight (kg) Vs Pain Feeling

Table 4.4: Multiple Comparison LSD (Least Significant Difference)

(I) Feeling pain		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Yes	no	1.02198*	0.39042	0.010	0.2471	1.7969
	sometimes	0.04103	0.27898	0.883	-0.5127	0.5947
No	yes	-1.02198*	0.39042	0.010	-1.7969	-0.2471
	sometimes	-0.98095*	0.45294	0.033	-1.8799	-0.0820
Sometimes	yes	-0.04103	0.27898	0.883	-.5947	0.5127
	no	0.98095*	0.45294	0.033	0.0820	1.8799

(* indicates that the value is statistically significant at 5% level of significance)

The result of the above multiple comparison shows that there exists a statistically significant difference in average bag weight among students who feel pain and who did not feel pain as the difference is 1.0219 kg with significance value of 0.01 which is less than 0.05. It means there is association between weight of carrying heavy school bags and occurrence of physical pain in children. The students feel pain to carrying heavy bags. However, the average bag weight of students is 4.3077 kg and they are feeling pain. The average bag weight of students is 3.2857 who did not report about pain feeling. The average bag weight of the students feeling pain sometime is 4.2667 kg. The ANOVA results indicate that there is a statistically significant effect of bag weight on physical pain.

H₀: There is no significance association between mode of carrying heavy bags and occurrence of physical pain and tiredness in school going children.

Table 4.5: Chi-square test on Mode of Carrying Bags and Occurrence of Physical Pain

Test	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.215 ^a	4	0.876
Likelihood Ratio	1.442	4	0.837

5 cells (55.6%) have expected count less than 5.

The Pearson chi-square value is 1.215 and the significance value is 0.876 that can be concluded as there is an insignificant association between mode of carrying school bags and occurrence of physical pain.

H₀: There is no significance association between transportation/mode to go to school occurrence of physical pain and tiredness in school going children.

Table 4.6: Chi-square test on Mode of Transportation and occurrence of physical pain

Statement		walking	bus	Car	bicycle	bike	Auto (rickshaw)	Total
Occurrence of physical pain	Yes	68%	2%	1%	0%	3%	4%	78%
	No	2%	1%	1%	0%	0%	3%	7%
	Sometime	7%	1%	1%	1%	3%	2%	15%
Total		77%	4%	3%	1%	6%	9%	100%
Chi-Square Tests			Value	Df	Asymp. Sig. (2-sided)			
Pearson Chi-Square			34.023 ^a	10	0			
Likelihood Ratio			25.503	10	0.004			
Linear-by-Linear Association			12.699	1	0			

14 cells (77.8%) have expected count less than 5.

The Pearson chi-square value is 34.023 and the significance value is 0.00 that can be concluded as there is a highly significant association between the mode of transportation to school and feelings of physical pain. This study results follows the previous (Afzal et al., 2013; Khanzada, 2016; Shahid et al., 2018) and AL-Qato (2012) and Mohd, Azuan K, *et. al.*, (2010) as well as (Mikkelsen *et. al.*, 2011) concluded that heavy school bags can cause physical pain such as back pain, shoulders and neck pain if not be carried properly, musculoskeletal problems and physical pains such as shoulders pain, was common in children due to their heavy school bags which may lead to change posture of body. Further They find out that standing position or walking attitude while carrying heavy load is associated with backbone pain (Mikkelsen *et. al.*, 2011).

For mode they carry their school bag almost 55% respond that they carry bag on two shoulders on the other hand 44% replied they carry school bag on one shoulder and only 1% answers they carry books and school bags by two hands. Pearson chi-square concluded as there is an insignificant association between mode of carrying school bags and occurrence of physical pain. This study results follows the previous studies, Rice *et. al.*, (2008) and Puckree *, et. al.*, (2004) also stated that students who carried school bags one shoulder complaint pain twice from those students who carried school bag on two shoulders equally. As well as experts recommended that students should carry their bags on two shoulders can save them from severe physical pain.

This study found that there is a highly significant association between the mode of transportation to school and feelings of physical pain. In other words, we can say that

the mode of transportation to school and physical pain are dependent or associated. This study results follows the previous study which also concluded that due to sedentary form of transport as well as carrying heavy school bags in excess of 30 minutes daily increased the chances of back and neck pain (Haselgrove *et al.*, 2008).

Teachers Data Analysis

Distribution of teachers by qualification

The large proportion about 50 % teachers are graduate, almost 25% are intermediate, master's teachers are about 20% and only 5% are matric pass. Distribution of teachers by experience the large proportion of teachers 45% have 5 to 10 years teaching experience, about 40% teachers have less than 5 years of teaching experience and only 15% have 11 to 20 years' experience in teaching profession.

Distribution of Teachers Opinion's Regarding Heavy School Bag

The teachers of primary private school's responses that students are facing issues regarding their heavy school bags, stairs and no facility of lockers. Is the handling of heavy school bags considered to be a serious problem at your school 90% teacher's states that the handling of heavy school bags consider a serious problem in their school. Among of these just 10% teachers respond handling of heavy school bags not considered a serious problem at your school. 55% agree that these heavy school bags carried squarely strapped to both shoulders. The school provide a locker facility to students in this the teachers are 100% disagree that the school does not provide lockers facility to students. The layout of the school premises presents additional problems, e.g. stairs, distances on this statement 80% are responds that layout of the school premises present additional problems for the students. Distribution of teacher's opinions about heavy items of school bags. The teachers respond that large proportion about 75% teachers respond that heavy textbooks contribute to excessive weight on the other hand 15% teachers replied that other items such as lunch box, water bottle, color and other stuffs contribute to excessive weight and only 10% respond that thick copies used by students play role for excessive weight.

DISCUSSION

The main aim of the study was to investigate the impact of heavy school bags on physical health of school going children. As well as association of mode of carrying and mode of transportation to go to school bags with occurrence of physical pain in children in private schools of primary level students in Hub Chowki, district Lasbela, Balochistan. It is found that there is a significant association between heavy school bags and occurrence of physical pain (such as neck, shoulders, backpain). Students feel pain while carrying school bags on one shoulder or two shoulders, so results revealed that there is an insignificant association between mode of carrying school bags and occurrence of physical pain. As well as study found that the mode of transportation to

school and physical pain are dependent. Almost 68% of the student's complaint feel physical pain who are used to go their schools through walking.

It is concluded that heavy school bags are one of the contributing factors of physical pain in school going children. This physical pain is directly and indirectly effecting the academic performance of students as well some time it leads towards dropout. Current studies revealed that incidence of physical pains is growing in school going children. Lockers should provide to students at schools. As researcher observed students carried school textbooks, copies, and other stuffs as well as tuitions copies which increased their weight of school bags. Timetable should provide to students to carry books and copies which are needed in the class. Transports facility should provide to students, this study found that those children who have no transportation facility experience severe physical pain. Upstairs issue should resolved in school, researcher experienced during interview of the students that they feel pain while climbing stairs with their heavy bags, according to specialists its risky which cause serious physical pain such as neck, back and affect vertebral column as well as lung pain and breathing issue etc.

RECOMMENDATIONS

As specialists recommended students should wear school bags equally on both shoulders which will reduce the rate of physical pain. Instead of registers students should use loose- leaf notebooks which pages will easily sperate and students can keep at home while not needed in class. This study have a gap in future for in-depth research regarding impact of heavy school bags on physical health of school going children and investigation needed about the contributing factors and their association with physical health as well as signs of physical pains which will be risky for children in adulthood. In Pakistan, especially in Balochistan this study needs in depth research in both primary as well as in secondary level of both private and public schools.

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