

A Descriptive Study to Assess the Selected Musculoskeletal Problems due to Carrying Heavy School Bag among the Students (10 to 12 Years) in Selected Schools of Urban Area

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Abstract: *A descriptive study to assess the selected musculoskeletal problems due to carrying heavy school bag among the student (10 to 12 yrs.) in selected schools of urban area. the study objective was to assess the musculoskeletal problems due to carrying heavy school bag among school going children in urban area and to measure the musculoskeletal discomfort in school going children. The research approach used was Non experimental Descriptive survey approach. Total 200 samples are selected for the study. The research design selected for the study was Non experimental Descriptive design. The setting was selected urban area. The sample includes school going children (10-12year); sampling technique was used purposive sampling. pGALS screening test used for the assessment. The pilot study was conducted with 20 samples. Reliability was established by Guttman split –half method. Data was analyzed by using descriptive and inferential statistics. Accordingly, findings and analysis of data shows that, the majority of school going student are more leads to suffer with back and spine and neck and shoulder problems.*

Keywords: pGALS, (pediatric gait arm leg, scale) WHO, (World health organization) MSP (musculoskeletal pain) BW (body weight)

1. Introduction

A muscle is like a car. If you want it to run well early in the morning, you have to warm it up.

–Florence Griffith Joyner

Children play an important role in the population dynamics of a country. They will be the future adults and parents of tomorrow. Hence, protecting the children's well-being especially during their vital age is a fundamental act because being unhealthy and frequently sick will cause a poor learning process at school. This act will ensure that the children will receive an enjoyable life, health, identity, education and other fundamental goods as planned without jeopardize. vtheirhealth. Prevalence of musculoskeletal pain in schoolchildren, as young as 7 years of age, has been reported. A study in Iran particularly looked at the prevalence of musculoskeletal pain among 307 primary school children. It was alarming to find that 86% of the children reported presence of musculoskeletal symptoms at the younger ages between 7 to 12 years. Carrying heavy backpacks can lead to a wide range of pain-related musculoskeletal disorders and postural dysfunctions in children. For two reasons children are more vulnerable to the risk of overuse injuries. First, great amounts of cartilage in a child's skeleton, especially in growth areas, as it is predecessors to bone ossification. Second, the decline in soft tissue flexibility or muscle imbalances can also cause injury. Soft tissue elongation that happens as a response to longitudinal bone growth, leads to a period during growth when muscles and tendons become taut and lose flexibility as a result. Therefore, the spine may be at the risk of injury for a longer period of time. The consistent physical stresses

due to carrying backpacks lead to significant forward lean of the head and trunk. Daily intermittent abnormal postural adaptations are assumed to be the cause of pain and disability in children of school going age. A recent study at Houston, USA International School, in the age group of 11.1 to 14.5 years found that about 60% of the students had chronic musculoskeletal pain as a result of carrying backpacks to school.¹The World Health Organization (WHO), after realizing the potential of musculoskeletal disorders to impair the health of societies at large, declared the years 2000–2010 as a bone and joint decade.² Studies among Indian school going children have reported the prevalence of MSP to range between 55% and 86%.Musculoskeletal complaints including musculoskeletal pain (MSP) were largely neglected till recent times owing to their nonfatal nature. In recent times, studies have shown that rheumatic musculoskeletal symptoms are the most common morbidities among the Indian communities with prevalence ranging from 7.08% to 33.09%³ In recent years too, the issue of schoolchildren carrying heavy school bags has been raised in both India and abroad. Following this, several countries and states have put forth recommended levels of schoolbag weight carriage, for schoolchildren. It recommends for bags to weigh <10% and could be up to 15% of the child's body weight⁴In India, 54%–91% of schoolchildren carry bags that are above the recommended bag weight carriage levels. Earlier studies have reported that private school students carry heavier bags compared to government school students.⁵Significant relationships have also been observed between heavy school bag, and educational failure, school absenteeism, lack of motivation and learning among the school going children.⁶**background of the study:** Schoolchildren usually use school bags to

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carry their school materials. Carrying heavy school bags can cause several problems such as musculoskeletal problems among schoolchildren. The aim of this study was to investigate the association between the weight of school bags and the occurrence of low back, shoulder and hand/wrist symptoms among primary school children.⁷ Musculoskeletal disorders refer to any disorder in muscles, tendons, tendon sheath, peripheral nerves, joints, bones, ligaments, and blood vessels caused either by repetitive stress in the long run or a sudden acute strike, such as sliding or falling. Increasing risk of chronic musculoskeletal disorders in students due to heavy school bags and inappropriate carriage may cause problems in spine development. In previous studies, females with an average age of 10.5 years old and males with average age of 12.5 years old were reported to experience their first backaches. Lifting and carrying heavy bags causes forward deviation of the spine. Students' inappropriate posture results in pain and appearance of symptoms of discomfort in the neck, shoulders, and back. Studies have shown that 55% of students carry school bags weighing more than their body weight (10% to 15% of their total body weight). Since their body is growing and developing, they are more susceptible to musculoskeletal disorders and spinal pains.⁸

Need of the Study

School students are responsible on carrying their own schoolbag and so it is important for each student to carry their schoolbag properly in order to avoid or minimize postural problems, back pain and musculoskeletal disorder. Across the nation, millions of elementary, high school and college students are racing out to the school bus or carrying to their classes with overstuffed backpacks hang over their shoulders. While carrying a backpack to school each morning might seem harmless enough, it can cause some painful back and neck problems for students. Children carrying backpacks for school that load is too much weight are also at risk for short-term and possible long-term health issues. Heavy school backpacks may also deform natural curves in the back. If the curves are interrupted in the lower and middle back, the result is muscle strain and irritation to the rib cage or spine joints. Much of this suffering is brought by bad habits initiated during our younger years may be because of carrying overweight backpacks to school. The improper use of backpacks can lead to muscle imbalance that could turn into chronic back and neck problems later in life. The average loads vary greatly between studies the majority of reports indicate that the loads carried by students greater than the recommended limits.⁹

2. Literature Survey

The review of literature is a systemic identification, selection, critical analysis and reporting of the existing information in relation to the problem of interest.

Dianat I et.al. (2012) A cross-sectional study conducted on the use of schoolbags and musculoskeletal symptoms among primary school children: are the recommended weight limits adequate? the objective of the study was investigated the use of schoolbags and the prevalence of musculoskeletal symptoms among the Iranian primary school children. the sample size of the study was 307 The results suggest that the

current recommended weight limit may not be appropriate for school children in primary school, and that guidelines ought to consider factors other than relative schoolbag weight that influence the use of schoolbags among this age group.¹⁰

MwakaESet.al. (A cross-sectional descriptive study on Musculoskeletal pain and school bag use: in Uganda the objective of the study was set out to determine the prevalence of low back and other musculoskeletal pains and describe their relationship with schoolbag use in pupils. the sample size of the study was 532 pupils The sample size was calculated using the online OpenEpi software for sample size calculation for proportions (<http://www.openepi.com>).

Data was analysis by using the Microsoft Excel and then imported into Stata 10.0. the result of the study was A total of 783 consent forms were dispatched but only 532 parents (67.9%) consented for their children to be included in the study. These 532 pupils from 6 primary schools participated keeping the power (1-β) of the study above the calculated 99% for the targeted 520 pupils. The 532 school going pupils were from five public schools and one private school. They comprised of 237/532 (44.6%) males and 294/532 (55.4%) females. The mean age of the pupils was 13.6 years (range 10- 21 years ± 1.66). The mean age of pupils from the urban schools was 12.9 ± 1.9 compared with 14.3 ± 1.5 for the rural schools. The overall mean weight of the pupils was 46.82 kg ± 9.1 (range 28.5- 84.9 kg) (males 46 ± 9.1, females 47.5 ± 9.1). the conclusion of the study was Urban pupils were younger, carried significantly heavier bags, and less likely to complain about schoolbag weight than the rural pupils. The majority of pupils complained of musculoskeletal pain of which 35.4% was attributed to the schoolbags. The prevalence of lower back pain was 37.8%. Schools need to provide lockers and functional libraries in order to avoid excessive loading and repetitive strain injuries.¹¹

Van Gent C et.al. (2003) A study was conducted on “the weight of school bags occurrence of neck, shoulder and back pain in young adolescent.” A cross- sectional study of 745 young adolescent in the area of two regional health center and the study is to assess occurrence of neck, shoulder and back complain in the young adolescent and examine the relationship with type and weight of school bags. A questionnaire was used asking about complaint of back, neck and potential risk factor including psychosomatic factors. Studies shows that neck and shoulder complaint and back complaint were reported by about 45% young adolescent. Severe complaint of neck and shoulder were reported by 6% and severe back complaint by 7% of school children.¹²

Puckree T et. al. (2004) A study was conducted on school bag carriage and pain in school children and the study is to determine the relationship between pain and school bags carriage. A study was carried out at four different school and 176 children between the age of 11 & 14 yrs correctly filled out a questionnaire with open ended and closed ended question. Each child also had his or her body and bag weight measured and studies shows that most of the scholars experience shoulder and combination of shoulder and other

bodily pain. Majority of the children carried backpack over two shoulder and type of the bag carried was significantly related to pain experience.¹³

Rachhanna S et.al. (2018) A Cross-Sectional Study conducted on to Assess Effects of Schoolbag Weight and Musculoskeletal Health Problems in Primary School Students of Kolhapur the study aimed to determine the prevalence of musculoskeletal health problems in primary school students of Kolhapur. The sample size of the study was 886 primary students. Data was collected by using structured questionnaire. Data was analyzed by using frequency distributions and descriptive statistics using SPSS software. The result of study shows that of the 886 primary school students, 82.7% (n=826) carried schoolbags >10% body weight. 64% (n= 567) complained of musculoskeletal discomfort related to carrying their schoolbag. The Conclusions of this study Prevalence of musculoskeletal symptoms in students from English medium schools and Marathi medium schools was 77.4% & 36.9% respectively; prevalence of musculoskeletal symptoms is higher in CBSE (Central Board of Secondary Education) pattern schools (73%) than in SSC (Secondary School Certificate) pattern schools (55%). The study provides practically feasible solutions to tackle the musculoskeletal health problems in primary school students and emphasizes on securing 'the health' in a healthy childhood.¹⁴

Dockrell S et.al. (2015) A study was conducted on Guidelines for schoolbag carriage: An appraisal of safe load limits for schoolbag weight and duration of carriage. the objective of the study was to establish if there was a threshold for musculoskeletal discomfort based on (i) percentage bodyweight (% BW) of the schoolbag; (ii) duration of carriage; or (iii) combined % BW and duration. the sample size of the study was 462 primary school children the result of the study was The mean schoolbag weight (4.8 ± 1.43 kg) represented a mean $12.4 \pm 4.18\%$ BW. Only 30.7% of the sample carried schoolbags that were $\leq 10\%$ BW. The majority (76%) carried schoolbags to school for ≤ 10 minutes. No % BW, duration of carriage or mechanical burden criterion provided a threshold cut-off point for accurately predicting schoolbag-related discomfort. and the conclusion of the study was Guidelines for safe schoolbag carriage that are based on mechanical factors alone could not be upheld. The association between duration of carriage and back discomfort warrants further investigation.¹⁵

Problem Definition

"A Descriptive study to assess to selected musculoskeletal problems due to carrying heavy school bag among the students (10 to 12 years) in selected schools of urban area."

Objectives of Study-

Primary Objective

To assess the musculoskeletal problems due to carrying heavy school bag among school going children in urban area

Secondary Objective

- 1) To measure the musculoskeletal discomfort in school going children

- 2) To find out the association between musculoskeletal problems of students with their selected demographic variable

3. Material and Methods

Quantitative research approach, non-experimental descriptive research design. Study conducted in selected school among 200 school going children by purposive Sampling Techniques. Tools used for data collection include two section namely demographic variable and Modified PGALS scale. analysis were SPSS 24.0 version 7.0.

4. Results

modified pGALS screening test is used for data collection. The analysis was done with the help of descriptive and inferential statistics.

S. No.	Data analysis	Method	Remarks
1.	Descriptive statistics	Frequency and percentage	To describe the distribution of demographic variables
		Mean, median, standard deviation	To determine the musculoskeletal problem due to carrying heavy school bag
2.	Inferential Statistics	Chi – square test	To determine the association between prevalence of musculoskeletal problem of student with their selected demographic variable.

The data was analyzed and is presented in the following sections: -

The collected data is analyzed on the bases of objectives of the study in the following way:

Section A: Distribution of school going children with regards to demographic variables.

Section B: Assessment of level of musculoskeletal problems due to carrying of heavy school bag among school going children in urban area.

Section C: Association of musculoskeletal problems among school going children with their selected demographic variables.

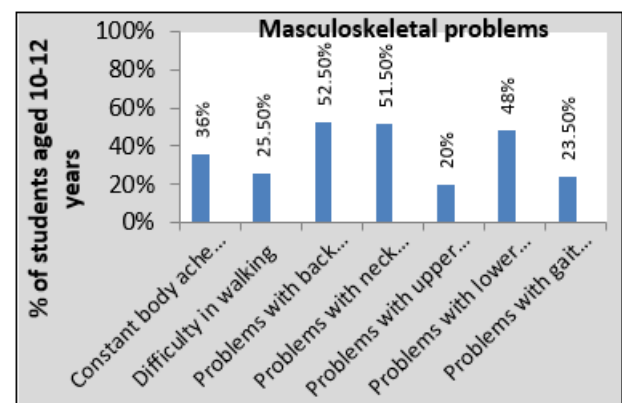


Figure 1: Assessment with level of musculoskeletal problems

The above figure 1 shows that 36% of the students had constant body ache, 25.5% of the students had difficulty in walking, **majority of students were 52.5% had problems with back and spine, second majority problem 51.5% had problems with neck and shoulder**, 20% had problems with upper extremities, **48% had problems with lower extremities** and 23.5% of the students had problems with gait and posture.

5. Discussion

The findings of the study have been discussed with reference to the objectives. As per the findings of the study it provides the description related to demographic variable, which shows majority of School going children were between the age of 10 - 12 years, with primary education qualification. As well as majority of school going children in this study belongs to nuclear family and belongs to the Hindu religion. Majority of school going children having the musculoskeletal problem due to carrying heavy school bag. In this study the investigator assess the selected musculoskeletal problem like Constant body ache (pain), Difficulty in walking, Problems with back and spine, Problems with neck and shoulder, Problems with upper extremities, Problems with lower extremities, Problems with gait and posture. As per the analysis of data Majority of school going children 52.5% had problems with back and spine, 51.5% had problems with neck and shoulder, the reliability of the tool for present study calculated by guttmann split half method and correlation coefficient value is 0.75.

6. Conclusion

Present study proves that due to carrying heavy school bag leads the different musculoskeletal problems. As per the analysis common musculoskeletal problem is related with back and spine (52.5%) and second majority problems are associated with neck and shoulder (51.5%) later which may lead problem related with lower extremities, walking difficulties and problem associate with gait and posture.

7. Future Scope

The future scope of this study has implications for nursing administration, nursing education, nursing research and nursing practice.

Nursing Services

Nursing service has directed significant impact on human health. The expanded role of the professional nurse emphasizes those activities which promote health and preventive behavior among peoples. The most of the school going children do not have the adequate knowledge regarding musculoskeletal problem due to carrying heavy school bag the presence study is an attempt to assess musculoskeletal problem due to carrying heavy school bag among school going children.

Nursing Education

Findings of the present study depicts that nurses requires broad knowledge to provide education regarding musculoskeletal problems which can improve the knowledge and minimize the musculoskeletal problem due to carrying

heavy school bag. Nurse educator can plan the strategies to overcome the musculoskeletal problems due to carrying heavy school bag through the community- based education to the school going children.

Nursing Administration

Nurse administrators are the back bone for providing facilities to improve knowledge regarding development of musculoskeletal problem due to carrying heavy school bag. Findings of the present study will help.

The nurse administrators can organize continue education program for school going children to update the knowledge and disseminate to the children in selected school.

The nurse administrators can also organize and plan different program to impart the information on assess musculoskeletal problem due to heavy school bag.

Nursing research

Nursing depends upon the selection systematic application and evaluation of knowledge from basic sciences. The present study will help: To undertake research in any areas like urban and rural community area so that the nurse can contribute to the prevention regarding development of musculoskeletal problem due to carrying heavy school bag among school going children.

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