



ORIGINAL RESEARCH PAPER

Nursing

A STUDY TO FIND THE RELATION BETWEEN SCHOOL BAG USAGE AND MUSCULOSKELETAL DISCOMFORT IN SCHOOL GOING CHILDREN AT AVADI

KEY WORDS: school back usage, musculoskeletal discomfort, school students, back pain.

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ABSTRACT
 Children of today are more stressed, and or over-involved in physical activities when compared with past generations. The usage of school bags and inappropriate carriage can increase the risk of chronic musculoskeletal disorders in students. so the present study is done to determine the relation between school bag usage and musculoskeletal discomfort in school going children at avadi. A descriptive research design was done in urban area of avadi. 60 school going students are included in our study .convenience sampling techniques method was used in selecting the samples. Structured interviews, observation checklists, and Cornell Musculoskeletal Discomfort Questionnaires (CMDQ) were used to collect data on musculoskeletal discomfort and school bag usage. 44(73%) students feels the pain while carrying the backpack. Students 41(68%) students thought that their school bag is heavy. 37(62%) students have shoulder pain. The study concluded that ministry of Education should set standards to prevent and manage the problems of carrying heavy school bags in the school going students.

INTRODUCTION:

Back pain and musculoskeletal discomfort among school children has been growing alarmingly. Selection of bag with unsafe characteristics, wrong method of carriage and use of heavy bags by school children especially in the period of vertebral column growth, can cause possible side effect on spine, musculoskeletal system. In Egypt, a cross-sectional study was conducted among Egyptian school girls aged 11-14 years have the prevalence of back pain was (45.8). Another study conducted in Nigerian the study concluded that back pain prevalence among school children aged 8 to 13 years is high (73.6%).¹

Cavallo et al., (2002) have pointed on rising cases of children between the ages 5 to 18 with back and shoulder pain related to the use of heavy backpacks seeking medical attention as reported by American Academy of Orthopedic Surgeons (AAOS) and Consumer Safety Commission (CSC).² Similar findings of injuries and emergency room visits related to backpacks and book bags in children 5 to 14 years old have been presented by the US Consumer Product Safety Commission National Electronic Injuries Surveillance System (NEISS) database in America as reported by Chiang et al., (2006). Another study by Grimmer et al. (1999) on Australian students found associations between loads carried and reports of back or spinal symptoms but did not describe what the associations were.³

Few studies conducted at the regional level, notably in Nigeria, South Africa and Uganda (Johnson et al., 2011; PuckRee et al., 2004; Mwaka et al., 2014) showed that a significantly large number of children experienced musculoskeletal pain that is linked to schoolbag use. A significant increase in weight and size of the school bags has been thought to contribute to the pain in the school children (Johnson et al., 2011). In the Uganda study most of the children who complained of musculoskeletal pain attributed it to heavy school bags used (Mwaka et al., 2014).^{4,5,6}

The community health nurse has a vital role in the provision of health services to children in school, identifying the major health problems experienced by children, providing preventive and screening services and health education. Health screenings can decrease the negative effects of health problems on education by identifying students with potential

health problems early and referring them for treatment as appropriate. Children are the future of the nation and hence, identification of health problems early in life and preventing them from becoming illness is of greatest importance.⁷

There are many issues that surround the use of schoolbags, the community has not been able to create specific global recommendations for children to safely use of school bags due to the conflicting data that is available in the literature.⁸

OBJECTIVES:

- To determine the musculoskeletal discomfort in school going children.
- To explore the correlation between the school bag usage with musculoskeletal discomfort in school going children.
- To determine the association between the demographic variables and musculoskeletal discomfort among the study participants

MATERIAL AND METHODS:

A sample of 60 school going children which includes 32 boys and 28 girls, age between 10-17 years. Samples are selected by convenience sampling techniques.

The descriptive study was conducted during a one week period. Data collection was conducted in immaculate heart of girls' higher secondary school avadi, after getting permission from the head minister of the school. Demographic variable consist of gender, age, weight, school bag weight, type of school bag, transportation mode, carry method and time spend to arrive the school. CMDQ is a questionnaire which contains sets of questions alongside a body map drawing indicating the prevalence of musculoskeletal pains or aches in specific regions of the body. The tool was developed by Professor Alan Hedge and ergonomics graduate students at Cornell University (Cornell University Ergonomics Web, Hedge et al., 1999).

The questionnaire was used to get the socio- demographic factors of the school going children as well as means of time taken to travel from school to home, duration of school bag carriage and students perception of the weight of school bag. An observational checklist is used assess the bag content carrying method and posture was given and assess the associated factors related to musculoskeletal pain.

The study investigators explained to the students about the study's objectives, rational and requirement of consent to participate in the study. The investigators then provided instructions for filling the questionnaire, and then guided the students t Understanding of each question was checked by asking the students to repeat the meaning. During the filling of questionnaires, the investigators helped the students throughout and helped simplifying the meaning of each question, clarifying doubts and checking for completeness of filling up the questionnaire, after the questionnaires were collected, students were instructed to go for anthropometric measurements, and weight of their bags was also measured. The height and weight of the students were measured.

Chi-square test was used to test the association between categorical variables. P < 0.05 was taken as statistically significant.

RESULTS:

Out of 60 samples majority of the students are at class 9-10 about 28(47%). 44(73%) students feels the pain while carrying the backpack and 16(27%) students doesn't feel pain while carrying the backpack. Majority of the students 41(68%) students thought that their school bag is heavy.34 (54%) students had tired during carrying the school bag. Students bag contents such as books and stationeries only is about 24(40%).38(63%) students are carrying their by two shoulders.41 (68%) students backpack content is determine by the teachers. There was an association between the demographic variable and the correlation between the school bag usages with musculoskeletal discomfort in school going children. There was statistically significant found between the gender, transportation mode, carry method and the time spend to arrive the school and the correlation between the school bag usages with musculoskeletal discomfort in school going children.

FIGURE1: Distribution of students with different musculoskeletal discomfort

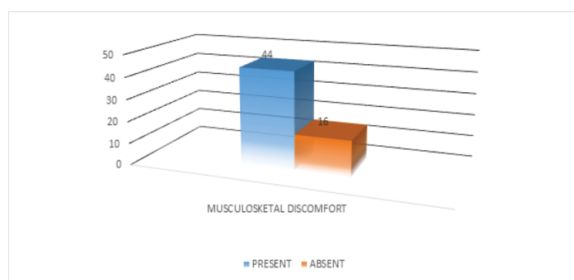


TABLE 1: Demographic variables of school going students in avadi.

S.no	Demographic Variable	Frequency	Percentage
1	Age		
	a) 10-12years	12	20%
	b) 13-15 years	36	60%
	c) 16-17 years	12	20%
2	Gender		
	A) Boy	32	53%
	B) Girls	28	47%
3	Weight		
	A) Up to 30	11	18%
	B) 30 -40	49	82%
	C) Above 40	-	-
4	School bag weight		
	A) 1-3kg	31	52%
	B) 3-5kg	26	43%
	C) Above 5kg	3	5%
5	Type of school bag		
	A) Backpack	60	100%
	B) Single strap bag	-	-

6	Transportation mode		
	A) Walk	31	51%
	B) Bus	16	27%
	C) Others	13	22%
7	Carry method		
	A) One shoulder	22	37%
	B) Two shoulder	38	63%
8	Time spend to arrive the school		
	A) 1-5min	1	2%
	B) 6-10 min	15	25%
	C) 11-15 min	32	53%
	D) 16-30 min	-	-
	E) >30 min	12	20%

TABLE 2: Prevalence of musculoskeletal pain by site of occurrence among school going students.

Site of pain	Frequency	Percentage
Neck	27	45%
Shoulder	37	62%
Upper back	22	37%
Upper arm	16	27%
Lower back	18	30%
Forearm	2	3%
Wrist	0	0
Hip/buttocks	14	23%
Thigh	2	3%
Knee	0	0
Lower leg	16	27%
Foot	12	20%

The students are at the age group of 13-15years36 (60%). Most of the students are boys32 (53%).49(82%) students are under the weight of 30-50kg. school bag weight 1-3kg carrying students are about 31(52%) and 3-5kg is about 26(43%) and above 5kg bag weight is about 3(5%) students. Most of the students are walking from the home to school is about 31(51%) and 38(63%) students are carrying their by two shoulders and 22(37%) students are carrying their bag by one shoulder. Majority of the students are spending time to arrive the school at 11-15minutes is about 32(53%). (TABLE1)

FIGURE 2: distribution of students of intensity of musculoskeletal discomfort

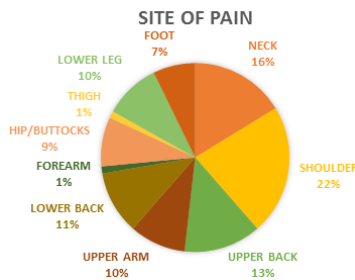


TABLE 3: school bag usage of study participants

S.no	Backpack usage of the study participants	Frequency	Distribution
1	Educational level		
	a) Class 6	1	2%
	b) Class 7	11	18%
	c) Class 8	8	13%
	d) Class 9-10	28	47%
	e) Class 11-12	12	20%
2	Do you feel pain while carrying the school bag or thereafter?		
	a) Yes	44	73%
	b) No	16	27%
3	Do you think your school bag is heavy?		
	a) Yes	41	68%
	b) No	19	32%

4	Do you take a break from carrying the school bag? a) Yes b) No	12 48	20% 80%
5	Does carrying your bag makes you tired? a) Yes b) No	34 26	57% 43%
6	Back pack content a) Books and stationeries only b) Books, stationeries and clothing c) Books, stationeries lunch/snake boxes d) Others	24 4 18 14	40% 7% 30% 23%
7	Back pack carrying styles a) Carries backpack with one strap b) Carries backpack with two strap c) Wearing backpack on body d) others	22 38 - -	37% 63% - -
8	Strap length/body posture a) long backpack strap b) short backpack strap c) stoops when carrying backpack d) walks upright when carrying backpack e) other	48 7 - 4 1	80% 12% - 7% 1%
9	Determines the backpack content? a) Teacher b) Parents c) Self	41 2 17	68% 4% 28%

DISCUSSION:

The present study assess the relation between the school bag usage and musculoskeletal discomfort. The result indicates approximately 44(73%) student's feels the pain while carrying the backpack and 16(27%) students doesn't feel pain while carrying the backpack. (FIGURE1) And 30% boys experience the musculoskeletal discomfort and 43% girls have the musculoskeletal discomfort. The students have shoulder pain is 37(62%)And 27(45%) students have neck pain due to school bag usage. 22(37%) has upper back pain and 18(30%) students has lower back pain. 2(3%) students has forearm and thigh pain.(TABLE 2).Which is similar to findings reported by Rawan Saleem Alghamdi et al, (2018) the study was conducted to assess the relationship between school bag weight and back pain among female students in Dammam city. A total of 288 school children (96.2%) were carrying bags of weight more than 15% of their body weight. Shoulder and neck pain were reported by 40% of the girls.⁹

An another similar study conducted by Simon ochieng ogana et al, (2016) the descriptive cross sectional study was to measure the backpack weight carried by pupils in Starehe sub-county in order to assess the effects of backpack weight on musculoskeletal pain. Majority of students (73.6%) complained of musculoskeletal pain. Low back pain (25.1%) was the most prevalent musculoskeletal discomfort followed by neck pain (16.9%). Very few students (0.8%) experienced pain in their right wrist. The results also revealed that most pupils (71.2%) did not take a break from carrying their school bag.¹⁰

The method of carrying bags is considered an important factor in back care, the right way of carrying a schoolbag can distribute the loads on the muscles and reduce the risk of having back problems or back pain. On the other hand, uneven distribution of load on the back can cause muscle strain, back pain or deformation in back bones.¹¹

In table 3 shows that 40% of students carries bag with books

and stationeries only where 30% students carrying there bag with books, stationaries, and lunch/snack boxes. In back pack carrying styles 63% of the school going students carrying their bag with two straps and 80% of students bags has the long back pack straps.

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