

Evaluation the Relation between School Bag Weight and Backache among Primary School Pupils in Tikrit City

Firas Tariq Ismaeel¹, Wheab Faraj Dawood², Nisreen Mohammed Ibraheem³, Aya Fawaz Mawlood⁴,
Ranya Jamal Mahmood⁵

¹Department of Orthopedics, College of Medicine, Tikrit University, Salahaddin, Iraq, ²Department of Surgery, College of Medicine, Tikrit University, Salahaddin, Iraq, ³Family & Community Medicine Department, Medical of College, Tikrit University, Salahaddin, Iraq, ⁴Department of Surgery, Tikrit General Hospital, Tikrit, Salahaddin, Iraq, ⁵Department of Surgery, Tikrit General Hospital, Tikrit, Salahaddin, Iraq.

Abstract

Background: The weight of Schoolbag in childrens school is an important issue within education and general health . Schoolbag overweight can cause back pain in children, which may lead to chronic back problems in adulthood.

The aim of this study is to evaluate the relation between the weight of school bag and backache among primary school pupils in Tikrit city.

Subject and method: A cross sectional study is conducted inTikrit primary schools from the first of November 2018 to the end of March 2019 among primary school pupils .

Sample size included 252 pupils, 130 were females and 122 were males. Two school chosen by cluster sampling , the pupils were chosen by stratified then simple random sampling methods ,the data collected by using a questionnaire which was administered by the interviewers the students were examined to exclude any present congenital anomalies.

Results: From the total sample of 252 pupils 74 (29.4%) pupils report backache from those 43 (58%) were females and 31 (42%) were males . The sequence of the location of back pain was upper as (59.4%) backache then middle (33.6%) and very few pupils have lower backache (7%) . The relation between bag weight/pupil weight percentage and positive backache in primary school pupils from the total 74 pupils suffering from backache 41 (55.4%) has the percentage of bag weight / pupil weight more than 15% , 26 (35.1%) pupils had it between 10%-15% and only 7 pupils (9.5%) had it below 10%.The back pain is most commonly reported among those who come walking to the school.

Conclusion :The study concluded that 74 (29.4%) of primary school pupils complained from backache among those 43 (58%) were females and 31 (42%) were males.

Key Words: Kilogram (Kg), Tikrit University College Of Medicine (TUCOM), Back ache, primary school pupils.

Corresponding Author:

Assist Prof. Dr. Firas Tariq Ismaeel,
Department of Orthopedics, College of Medicine, Tikrit
University, Salah Aldin, Iraq,
Email: Aymen.Altae@tu.edu.iq.
Phone: 00964-7719330585

Introduction

School is one of the important institutions , when it provides healthy environment it gives children's the capability to grow and flourish . The bag is the most common way used to take books , equipments and other things students need at school ,which stays with the

student along their study^[1] . .

The usage of computer based learning and online learning by dissemination the learning material to the students are policies used by countries to reduce the usage of bags to reduce its harmful effect on school children's^[2]. On the contrary, in Iraq, the risk factors for back pain caused by heavy school bags are increasing rather than decreasing , due to lack of studies on this important issue^[2].

The National Institute of Occupational Safety and Health reports shows that there are different limits of bag weight between countries . The mean carrying weight for children's in schools below the age of 16 years old are 14kg for boys and 8 kg for girls^[2] . Health centers all over the world agreed that children should not carry bags not more than 10%-15% of their total body weight^[3]. The American Occupational Therapy recommends a limit of 15% of body weight ^[3] . National Back Pain Association makes a guidelines which recommend that schoolbags must be under the weight of 10% of children body weight ^[4] .

In a recent study, prevalence of musculoskeletal disorders was 63.4% of students of mean age 10.6, the schoolbag affects the shoulders (27.3%) than on the back (15%) and the time was an important factor that affect the symptoms ^[5] . Students that carry heavy loads (bags) well develop pain in shoulders and neck which might cause musculoskeletal symptoms in early age^[6] .

An important factor the student learn how to carry his bag to avoid and decrease the postural problems, backache and musculoskeletal diseases. Carrying a load a backpack position can cause less problems than carrying in a lateral position ^[7] .

When Carrying the school bag on the shoulders rather on the back this well increase heart rate and oxygen consumption ,so carrying the bag on the back is accepted method due to usage of large muscle groups rather than small muscle groups in order to reduce muscle fatigue and pain ^[8]. In Indian schools a study shows that children's between the age 10-15 years to maintain good body posture ^[9, 10, 11].

Subjects and Method

Study population and sampling

Sample: two primary schools was chosen by cluster sampling , the pupils were chosen by stratified then simple random sampling methods and this study included 252 pupils, 130 were females and 122 were males all student were examined for presence of back congenital anomalies.

Presentation and data analysis:

All data management and analyses was done by manual statistical methods schoolbag weight/body weight percentage was calculated by the equation:

Statistical test (chi square) applied to test the significance of the results , chi square test achieved by manual calculation.

Results

The current study shows reported backache and its location in different stages in both male and females from the total sample of 252 pupils most of pupils do not report any backache 178 (70.6%) and only 74 (29.3%) pupils report backache from those 43 (58%) were females and 31 (42%) were males as in figure (1).

From the total sample of 252 pupils in 74 (29.4%) pupils report backache from those 43 (58%) were females among those females 36 (83.7%) had upper backache , 6 (14%) had middle backache and only 1 (2.3%) had lower backache .While in males 31 (42%) had backache among those 8 (25.8%) had upper backache , 19 (61.2%) had middle backache and 4 (13 %) had lower backache.

From the total of 130 females 87 (67%) have no backache and 43 (33%) report backache. While in males from the total 122 pupils 91 (74.5%) have no backache and 31 (25.5%) had backache .

An interesting finding that in those who have backache the sequence of the location was upper as (59.4%) backache then middle (33.6%) and very few pupils have lower backache (7%). Figure (1) show no significant association between backache and gender in primary school pupils at p-value less than 0.05.

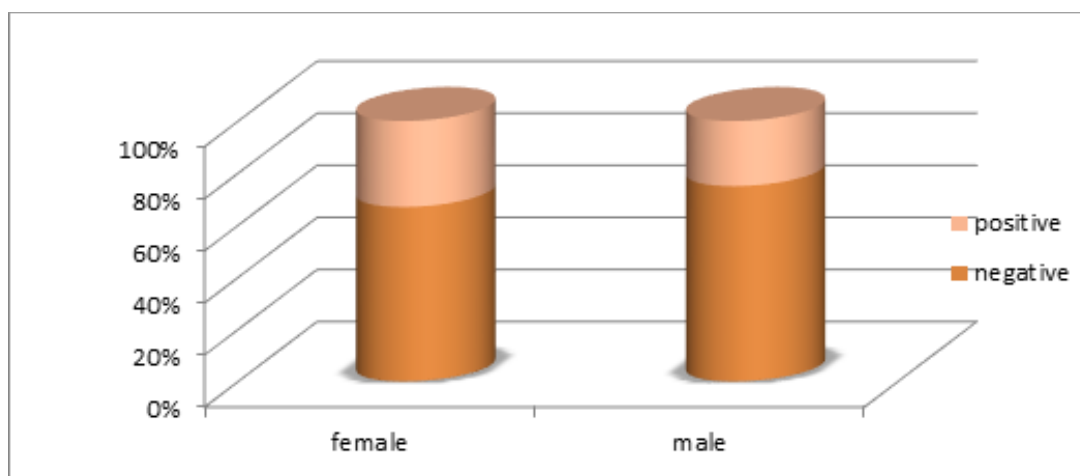


Figure (1) : Reported backache in primary school pupils

Figure (2) shows the bag weight/ pupil weight percentage which was 7 (5.3 %) female pupils have it below 10 % , 43 (33%) female pupils have the percentage between 10 -15% and 80 (61.7%) were more than 15% . While in male 14 (11.4%) pupils has it below 10 % , 46 (37.8%) between 10% - 15% and 62 (50.8%) above 15% .There is no significant association between gender and bag weight/ pupil weight percentage in primary school pupils at p-value less than 0.05.

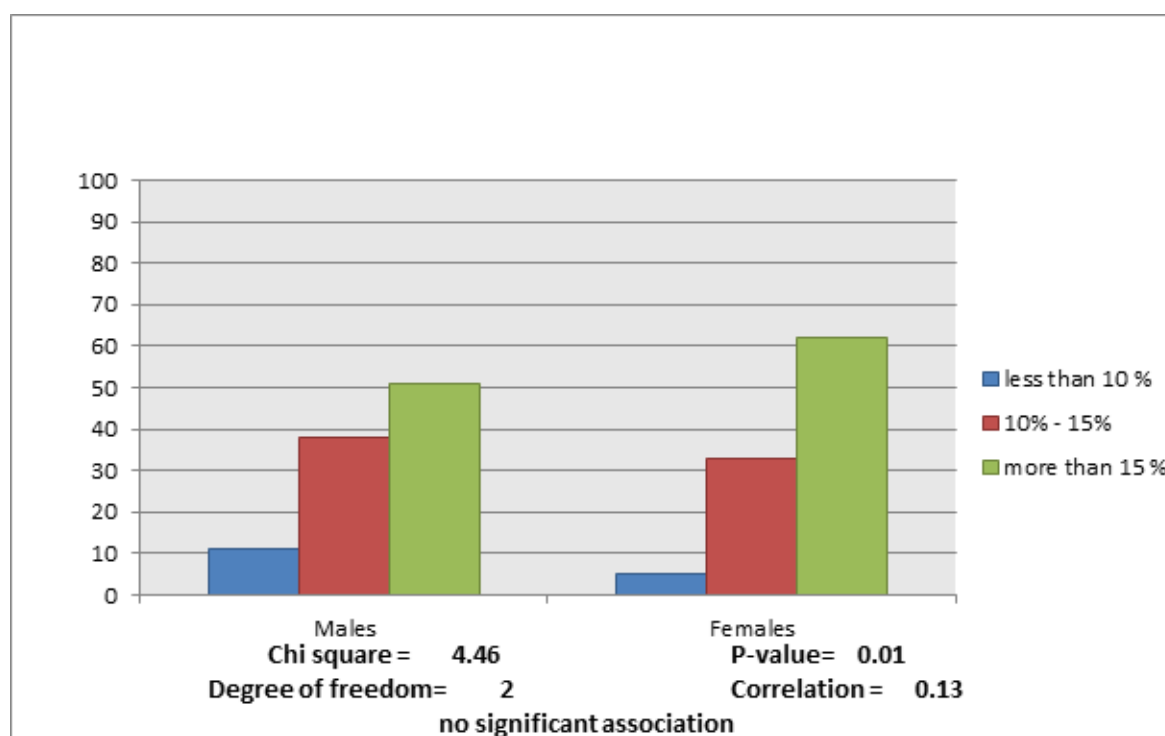


Figure (2) : percentage of bag weight / pupil weight in primary school pupils

Table (1) demonstrate the relation between the bag weight/pupil weight percentage and positive backache in primary school pupils from the total 74 pupils suffering from backache 41 (55.4%) has the percentage of bag weight / pupil weight more than 15% , 26 (35.1%) of pupils had it between 10%-15% and only 7 pupils (9.5%) had it below 10%

As we can notice in the table (1) that there is no pupil in first and second grades has the percentage below 10% that mainly due to their low body weight in relation to their heavy bags .There is no significant association between bag weight/ pupil weight percentage and positive backache in primary school pupils at p-value less than 0.05.

Table (1) The relation between the bag weight/ pupil weight percentage and positive backache in primary school pupils

Percentage Grade	Less than 10%	10% -15%	More than 15%	Total Number of pupils with +ve backache
First grade	0	5 (50%)	5 (50%)	10 (13.5%)
Second grade	0	3 (25%)	9 (75%)	12 (16.2%)
Third grade	2 (9.5%)	8 (38%)	11 (52.5%)	21 (28.4%)
Fourth grade	1 (10%)	2 (20%)	7 (70%)	10 (13.5%)
Fifth grade	1 (8.3%)	3 (25%)	8 (66.7%)	12 (16.2%)
Sixth grade	3 (33.3%)	5 (55.5%)	1 (11.2%)	9 (12.2%)
Total	7 (9.5%)	26 (35.1%)	41 (55.4%)	74 (100%)
Chi square = 15.39 P-value = 0.01 Degree of freedom= 10 Correlation = 0.41 Not significant association				

Table (2) show the relation between the bag weight/ pupil weight percentage and negative backache in primary school pupils from the total 178 pupils who has no backache 101 (56.7%) has percentage of bag weight / pupil weight more than 15% , 63 (35.3%) of pupils had it between 10% - 15% and only 14 pupils (8%) had it below 10 % .

As we can notice in table (2) in the first 4 classes the highest number of pupil has the percentage above 15% while in the last two classes the higher number were between 10% - 15% . There is very strong association between bag weight/ pupil weight percentage and negative backache in primary school pupilsat p-value less than 0.05.

Table (2) The relation between the bag weight/ pupil weight percentage and negative backache in primary school pupils

Percentage Grade	Less than 10%	10% -15%	More than 15%	Total number of pupils with -ve backache
First grade	0	6 (16.2%)	31 (83.8%)	37 (20.7%)
Second grade	1 (3.2%)	7 (21.8%)	24 (75%)	32 (18%)
Third grade	2 (13.3%)	4 (26.7%)	9 (60%)	15 (8.5%)
Fourth grade	4 (11.7%)	13 (38.3%)	17 (50%)	34 (19%)
Fifth grade	3 (10.3%)	17 (58.7%)	9 (31%)	29 (16.4%)
Sixth grade	4 (13%)	16 (51.6%)	11 (35.4%)	31 (17.4%)
Total	14 (8%)	63 (35.3%)	101 (56.7%)	178 (100%)
Chi square = 31.69 P-value = 0.001 Degree of freedom= 10 Correlation = 0.38, Very strong association				

Considering the way of transport regarding pupils with positive backache explain in figure (3) as the following : approximately the number of pupils going by vehicle is the same as for those who walk in the third and fourth grades while in the first and sixth grades the number of pupils who walk is less than those using vehicles and opposite to this is in the second and fifth grades. There is no significant association between stage and way of transport among pupils with positive backache p -value less than 0.05.

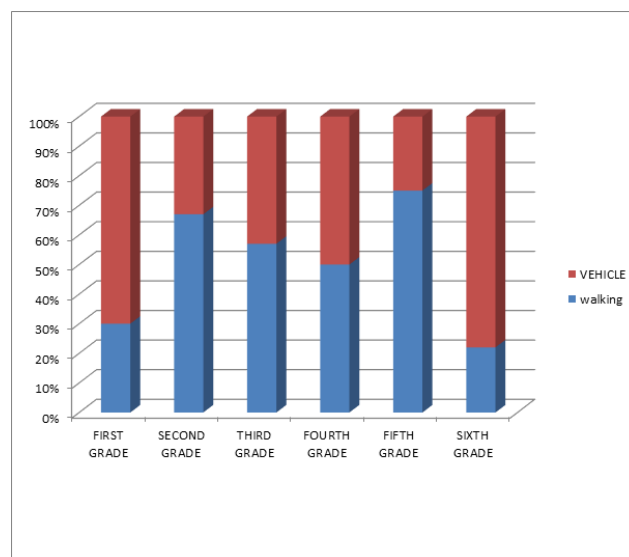


Figure (3) :Way of transport in primary school pupils with positive backache

In the current study , comparing positive with negative backache regarding examination results the study shows that most of the pupils who had an abnormal examination result had a backache .

Discussion

The weight of schoolbag in schools is an important issue within the educational and health sector. Chronic backache in adults may be caused by excessive schoolbag weight in childhood. This study is the first of its kind in Iraq to evaluate this situation and encourage the population to pay more attention for this problem.

A number of 74 (29.3%) of students suffer from the backache among the total of 252 students in comparison to a study in King Faisal University, Saudi Arabia in which it was 1170 (42%) student suffer from the backache among the total of 2567 students this study has a higher pupil number than our study ^[12] .

This study shows that third grade shows the highest percentage of backache 21 (58%) while in university Tenaga National (UNITEN) ,Malaysia fifth grade show

the highest percentage as 285 (87%) due to different daily schedule in each grade and each day of the week ^[13].

The majority of pupils are using the double strap bag whether they have positive(91.8%) or negative (94.3%) backache this corresponds with a study in Brazil which shows that the most popular style of schoolbag was found to be a backpack-style bag with two straps (95%) ^[14].

In this study pupils show abnormal examination result in the following percentages in positive backache (20.3%) , in negative backache (4%)while a study in university of Novi Pazar, Serbia show relatively high frequency of postural deformities ^[15] .

Conclusion

The study is concluded the followings:

1. The majority of pupils do not report any backache 178 (70.6%) and only 74 (29.4%) report backache.
2. Among pupils with positive backache (58%) were females and (42%) were males.
3. The location of backache in primary school mostly reported as upper back pain (83.7%) in females and as middle back pain (61.2%) in males
4. The percentage of bag weight/ pupil weight percentage in (61.7%) of females and (50.8%) males were above 15% .
5. The majority of pupils are using the double strap bag whether they have positive or negative backache.
6. Examination result in student with positive backache shows that (79.7 %) of pupils were normal and (20.3 %) of them were abnormal .

There are “**No Conflict of Interest**”.

Source of Funding: (them self).

Ethical Clearance: Committee members are approved to perform a study about:

After discussion of study plan with researchers:

- ☐ **Dr. Firas Tariq Ismaeel**
- ☐ **Dr.Wheab Faraj Dawood**

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