

Prevalence of neck, shoulder and back pain and its associated risk factors in secondary school female students in Hayatabad, Peshawar

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ABSTRACT

Introduction: It is common to find school children experiencing musculoskeletal pains. Serious health conditions may occur if these pains are ignored. Neck, shoulder and back pain have been found to be linked with heavy school bags, prolonged use of mobiles or computers and school furniture. This research was conducted to find out the prevalence of neck, shoulder, back pain and associated risk factors in females of secondary schools in Hayatabad, Peshawar, Pakistan.

Materials & Methods: Schools were selected by simple random sampling in Hayatabad region. Female students who were willing to participate between age 14-16 years were included in the study. Screening was done on students and those who met both the inclusion and exclusion criteria were included in the study. Exclusion criteria included students with the systemic disease, fractures, RTA, inflammatory joint conditions and menstrual pain. A modified version of Nordic and Dutch questionnaire was handed over to 323 female students. Risk factors included school bag, gadget use, school furniture, sleeping surface and mode of transport to school were measured. Results were analyzed using SPSS version 20.

Results: Most of the pains were prevalent among those females who belonged to Peshawar (22%). Neck pain was found among 7.1% of the students, shoulder pain in 10.2% and back pain in 23.2% of the included population. Association was found between neck-shoulder-back pain and school bags, school furniture and prolonged gadget use. Sitting, standing and being in an uncomfortable posture for a long time proved to be the risk factors for these musculoskeletal conditions.

Conclusion: Neck, shoulder and back pain were more among the female secondary school students who belonged from Peshawar. These conditions were associated with heavy school bags, prolonged gadget use, school furniture but not with body mass index.

Keywords: back pain, female students, heavy school bags, secondary school, school furniture.

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INTRODUCTION

The number of children who present with musculoskeletal (MSK) problems is increasing day by day as these children grow older, being particularly frequent among the adolescents.¹ The factors that can add to MSK symptoms include genetics, health status, prior injury, poor diet, and lifestyle.² Children between the ages of 12-14 need special concerns because spine is yet at the stage of development.³ In children back pain can be due to an underlying disease which requires careful attention.⁴ In a study conducted in Iran showed that the prevalence of shoulder and LBP was 70% among school-children.⁵ Studies have shown that school children across the world suffer from MSK problems especially in the shoulder and back.⁶ Neck pain is defined as pain between the occiput and the 3rd thoracic vertebra.⁷ The long term, lower intensity strains and stresses and improper body positioning are believed to be the most important causative factors for neck pain. Keeping the neck in proper alignment is very important in preventing neck pain.⁸ The shoulder complex comprises of the sterno-clavicular, acromio-clavicular, gleno-humeral and scapulo-thoracic joints. Pain located in or around these structures (any of

these) is referred as shoulder pain.⁹ Disability expenses of 18%, made for MSK disorders, were spent on neck and shoulder problems as shown by Swedish Insurance data. Thus, shoulder-pain is a big problem and inflicts a significant load on the suffering person and society.¹⁰ Lower back pain is a frequently occurring MSK problem. LBP refers to the pain located between the costal-margins(lower) and gluteal-folds(inferior) which typically occurs with restriction in movement.¹¹ Currently, numerous researches are being carried out in most parts of the world to find out these MSK conditions. In a study conducted on office workers and students in Lahore, Pakistan concluded that neck pain was experienced by 72% of the computer users. Strong association was found between neck pain and prolonged computer usage.¹² Results of a study conducted on school children in Bangalore, India concludes that pain in upper back-neck-shoulder (40%,27%,20% respectively) were the most prevalent body regions and all the participants shoulder had a pressure mark.⁶ Four to five hours of daily computer use is reported cause of pain in neck in young children.¹³ A study conducted by Andres Vikat et al, neck, shoulder pain was perceived by 15% of 12-18 years old and low back pain by 8% and the symptoms were more prevalent among girls.¹⁴ School furniture design is also attributable to back pain.¹⁵ In a

longitudinal study, less sleep or insufficient sleep quality and tiredness was linked to Lower back pain among girls.¹⁶ Use of PCs daily for >2 hrs looks like the threshold for neck & shoulder pain and more than five hours for lower-back pain.⁸ School-bags can injure joints and muscles and could be the cause of back ache if they are too heavy or are used incorrectly.¹⁸ According to a study in Finland pain of the neck-shoulder-lower back was frequent among girls and older-adults.²⁰ In another study in Finland it was found that those who had low or high screen position, suffered from neck pain, however shoulder pain was associated with the high position of screen and elevation of shoulder in computer-mouse users.⁸ A study conducted in Surrey, UK found that, neck and back pain were highly linked to furniture of school, psychological problems, history of LBP (family history) and prior treatment for MSK disorders. However, upper-back ache was also linked to school-bag weight.²² In New Zealand, a study on 140 school students concluded that most of children had MSK pain and school bags were one of the major contributing factors.²³ In a follow up study of preadolescence to early adolescence, MSK pain recurrence was associated with depressive feelings among girls.¹⁶ No such studies were identified regarding the wide spread presence of neck, shoulder and back pain in Peshawar, KPK. Therefore, our research was aimed to find out how frequently neck, shoulder and back pain occur and to find out the burden of these pains in female secondary school students of Hayatabad Peshawar.

MATERIALS & METHODS

This cross sectional, school centered study was carried out in secondary schools of Hayatabad Peshawar during the final semester from September 5 to December 30, 2016. Study approval from ethical review board of KMU and written consent was obtained from the principal of schools before procedure of collecting data. Consent form included an explanation of our research work was handed over to students. Information sheet was given to the participants giving a brief review about the study. There were total 22 female secondary schools in Hayatabad and the total population of students in these schools, age 14-16, was 2000. From these twenty-two schools 10 were selected by simple random sampling method. Sample size was calculated from sample size calculator. <https://www.surveysystem.com/sscalc.htm>. A self-administered questionnaire was handed over to the students in schools to fill in the required information. Modified Nordic musculoskeletal questionnaire (NMQ) and modified Dutch musculoskeletal questionnaire were used.²⁶ It has been reported

that the questionnaire was acceptable in a 'screening tool'.²⁷ It's a repeatable and sensitive plus a useful screening and surveillance instrument.²⁸ The reliability of the NMQ found variable answers ranged from zero to twenty three %.²⁶

The questionnaire included questions regarding school name, age, class, current and permanent address, body mass index and neck, shoulder and back pain. Questions were asked about risk factors causing these pains. The current study was carried out on a 'random sampling' manner, ten arbitrary chosen schools (government and private) in Hayatabad, Peshawar. Exclusion criteria included students not willing to participate, systemic disease, fractures, RTA, inflammatory joint conditions and menstrual pain. The questionnaire was thoroughly explained by the researchers along with the information sheet. Descriptive statistical approaches were used to find out frequency variables, cross tabulation and Chi-square test. Results were analyzed using 'SPSS' (version 20).

RESULTS

Response rate was 100%. Prevalence of neck-shoulder and back pain in this research was 7.1%, 10.2% and 23.2% respectively. It was higher among the girls of 16 years (n=123, 38%). The prevalence of these pains was higher among those who belonged to Peshawar (22%). From the selected 10 schools back pain was highest among the students of Government Girls Higher Secondary School Phase 1 (37.3%), neck pain was highest among Beacon House School System (26.1%), neck and back pain was prevalent in 25.7% students of Qurtaba School. Standing for longer periods resulted in neck and back in 42.9%, shoulder and back pain in 43.6% and back pain alone in 48% of the female students. Sitting for longer periods caused neck and shoulder pain in 36.8%, shoulder and back pain 61.5% and back pain in 53% of students. Sitting or standing in an uncomfortable posture caused neck and back pain in 57.1%, shoulder and back pain in 46.2% and neck, shoulder, back pain in 64.4% in the total population. All of the schools used hard wooden chairs which was the risk factor for back pain in 27.6% and neck-shoulder-back pain in 17.6% of the students. Neck, shoulder and back pains were reported by 76.7% of the students who carried more than 10 books and copies in their school bag. Neck pain was reported by 26.1% within 2 hours of gadget use, while 37.5% and 33.3% had shoulder and back pain respectively within 1 hour of gadget use. For details see table 1.

Table 1: Duration of use of gadgets and pain reported in the selected population

Area	<1 hour	1-2 hours	2-3 hours	3-4 hours	>4 hours	N/A
Neck	21.70%	26.10%	13.00%	0.00%	8.70%	30.40%
Shoulder	37.50%	12.50%	9.40%	3.10%	15.60%	21.90%
Back	33.30%	17.30%	6.70%	2.70%	9.30%	30.70%
Neck and Shoulder	21.10%	10.50%	21.10%	21.10%	15.80%	10.50%
Neck and Back	25.70%	22.90%	11.40%	8.60%	11.40%	20.00%
Shoulder and Back	35.90%	30.80%	12.80%	2.60%	2.60%	15.40%
Neck and Shoulder and Back	21.30%	14.90%	8.50%	14.90%	14.90%	25.50%
None	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%

DISCUSSION

There is limited literature available on neck, shoulder, back pain and their risk factors in female students in Peshawar, KPK, Pakistan, therefore this study was conducted. Findings of this survey showed that 23.2% (n=75) of the secondary school female students had back pain, 14.9% (n=48) had neck pain. Findings of our study showed 21.25% (n=18) of the study population of 14 years of age suffered from back pain. Among those who were 15 years old 20.9% (n=24) experienced back pain only and 14.6% (n=33) of the girls aged 16 years experienced shoulder and back pain.

In the current study, 14.9% of the female students suffered from back pain sometime during the past 12 months. A study conducted by Hakala et al concluded that these MSK conditions were more common in children (older children and girls) and that back pain was quite common in young children, with higher occurrence in older children. Another study by Noll et al showed higher prevalence of back pain among girls and it was reported that these results were because of females having unique characteristics in comparison to males. According to our study 21.1% of the study population (n=68) had to reduce their activities due to pain in their back. A study by Noll et al concludes that back pain was experienced by majority of the students once per month that resulted in impaired performance of daily activities in 17.4% of the students.

Significant association was found between neck-shoulder-back pain and carrying school bag (p value = <0.05%) In our study neck, shoulder and back pain was reported by 76.7% of the students who carried more than 10 books and copies in their school bag. In a study conducted by Singh et al, heavy book bags were reported a major contributing factor to strains and neck pain. We found that, because of higher educational standards, students are getting more assignments at younger age, causing them strain in shoulder and neck.

In our study 64.7% suffered from back pain while carrying their school bag. In a study conducted in Iraq, heavy bag and physical activity like participating in sports were associated with muscle strain and sprain which are common causes of back pain in children. The studies that have been done relating to safe backpack load were not only related to postural changes but also to direct effects of the load in the backpack on children such as oxygen consumption, energy consumption and blood pressure.

Association was found between neck-shoulder-back pain and trouble faced by the students while sitting in an uncomfortable posture for a long time. According to our study 38.7% of the total population suffered from back pain due to sitting in an uncomfortable posture for a long duration. A study conducted by Noll et al, believed that back pain in students can be because of the improper postures adopted in daily life activities.

There was association between the bulk of time students lost using gadgets and neck, shoulder & back pain. According to our study 21.2% of the girls suffered from Neck and shoulder pain when using gadgets for 2-3 hours a day. A study conducted by Hakala et al concluded that using computer for more than two to three hours daily might be a cause for neck and shoulder discomfort. Baker concluded that MSK pain was significantly linked to number of hours of computer use. Association was found between number of books and copies carried by students in their school bag and neck, shoulder and back pain. In our study 76.2% complained of neck and shoulder pain while carrying more than 10 books and copies in their school bag. School children reported that their bags were heavy in which the girls carried more weight in their school bags than boys. Risk factors that resulted in neck and shoulder pain were female gender, students weight and heavy bag weight.

Association was found between neck-shoulder-back pain and the

kind of chair used by students. Around ¼ of students reported having neck-shoulder-back pain when sitting on a hard wooden chair in school. According to Murphy et al, neck pain was found to be linked with type of furniture in schools, emotional and behavioral problems, past history of musculoskeletal disorders. In our study 27.6% of the girls had experienced back pain due to sitting on hard wooden chair in school. Back pain was associated with weight of school bags, school furniture and family history. The results of another study by Saarni et al indicate that there is mismatch between school furniture and the anthropometrics of school children.

CONCLUSION

In secondary school female students, prevalence of neck, shoulder and back pain is higher in those living in Peshawar. Neck, shoulder, back pain was associated with school furniture, gadget use, heavy school bags but not with body mass index.

RECOMMENDATIONS

Adjustable school furniture, mini breaks during prolonged gadget use, symmetric backpack carrying, regular cleanout of the backpack, setting up of lockers at schools, regular checkup when needed could be helpful in preventing these pains and better overall academic performance. In future studies, a proper physical exam of students should be carried out in addition to filling questionnaire.

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