

## PREVALENCE OF LOW BACK PAIN AMONG PRIVATE MIDDLE SCHOOL CHILDREN IN HAYATABAD

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### Abstract

**AIM:** The objective of this study was to determine prevalence of low back pain among private middle school children in Hayatabad.

**METHODS:** A total of 613 students with age group between 11 to 15 years participated in the study. They were evaluated with Pre Shaded Minikin, Low Back Pain Symptom Characteristics and Modified Hanover Low Back Pain Disability Questionnaires.

**RESULTS:** Chi square test was used for the statistical analysis of the data. The period prevalence of low back pain was found 41.1%. Among those with LBP, 94.0% of the participants reported that Low back pain lasts for <12h, 48.8% of the participants reported score 4 on faces scale, 8.3% of the participants reported radiating pain down the leg whereas medical consultation was reported by only 7.9% of the participants. There was no significant difference between boys and girls. On Modified Hanover Low Back Pain Disability Questionnaires, less number of children reported severe limitations in activities. About 63.1% of the participants reported activity limitations by sitting on a school chair for a 45 minute lesson, whereas 62.3% of the participants reported pain in carrying school bag activity.

**CONCLUSION:** Time prevalence of low back pain is high in school children and medical constancy remained ignored in majority of the cases.

**KEY WORDS:** Low Back Pain, mechanical LBP, school children, Adolescents, Pre Shaded Minikin Questionnaire, Hanover Low Back Pain Disability Questionnaire, Prevalence.

### INTRODUCTION

The human back forms the posterior part of the trunk from the neck to the pelvis.<sup>1</sup> It is composed of bones, muscles and other soft tissues.<sup>1,2</sup> The centerpiece is the spine or vertebral column which supports and provides base of support for the weight of upper body and head and ultimately transfer the weight to lower limbs.<sup>3</sup> It is made up of more than thirty bones or vertebrae.<sup>1,3</sup> The vertebrae are separated from one another through intervertebral discs that are round, spongy pads of cartilages.<sup>2</sup> They act as a shock absorber and give

the back flexibility.<sup>4</sup> Ligaments and muscles support the whole spine and maintain correct alignment.<sup>1</sup> The spine comprises of three major curves when viewed laterally i.e. cervical and lumbar lordosis and thoracic kyphosis.<sup>1,2,3</sup> The spinal structure of adolescents is different from that of adults.<sup>1,4</sup> They undergo distinct growth periods during their course of development especially during school going age i.e. between 4 to 16 years of age.<sup>1,5</sup>

Most of the people experience back pain at some point in their lifetime.<sup>3</sup> The most common type of back pain is low

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back pain which occurs in about 60% to 80% of people.<sup>6,8</sup> It is a common musculoskeletal disorder which has been reported as one of the leading causes of disability in adolescents worldwide.<sup>5,8</sup> Low back pain is mostly confined to the region between the lower margins of the 12<sup>th</sup> rib and the gluteal folds.<sup>6</sup>

It has been reported that the prevalence of LBP had a direct relation with increasing age age.<sup>7,11,19</sup> It has higher prevalence rates in girls than boys.<sup>7</sup> Prevalence of LBP in adolescent is similar to that of adults.<sup>10</sup> According to studies, 10% to 30% of children feel back pain, especially LBP by their teenage years.<sup>2</sup> The point prevalence of LBP shows that one child out of every twentieth is suffering from LBP.<sup>17</sup> The prevalence of back pain in adolescent is between 30% to 70%, depending on the following factors: 'type of pain, age, gender of the study population and type of study design'.<sup>8,9</sup> According to studies, one year prevalence of LBP in adolescents is about 50% and life time prevalence about 70-80%.<sup>1</sup> The lifetime prevalence of LBP in adolescents is up to 84%.<sup>3</sup> The one month period prevalence of LBP in 11 to 14 years old adolescent is 24%.<sup>13</sup> In Australia, about 20% of children aged 12 to 18 years have LBP related to heavy

backpack use.<sup>1</sup> The monthly prevalence of LBP in India has been placed between 35%–37%.<sup>3,8</sup> The severity of LBP causes 16% to 23% of children to miss their school based activities and sports and results in absenteeism.<sup>1,10</sup>

In children LBP with no apparent clinical cause is common.<sup>9</sup> But according to studies potential risk factors for the development of LBP in school going children and adolescents include; age (incidence of LBP increases at the age of 12 years and onward), gender (girls are more likely to experience LBP than boys), weight, height (LBP is more common in shorter children as compared to taller ones), heavy school back packs more than 15% of body weight, school bag carrying position, increased duration of backpack carriage, holding the bag by its straps in one hand, backpack which is fitted incorrectly, school furniture, prolong sitting (more than 30 min), previous back injury, sports (participants of the following sports are more likely to develop LBP; volleyball, basketball, handball, golf, climbing), hyper-lordosis (exaggerated lumbar curvature), hyper-kyphosis (exaggerated thoracic curvature) and scoliosis (abnormal lateral curvature).<sup>13,14,18</sup> Psychological factors like response to pain, depression, anxiety and stress are also involved in causing low back pain.<sup>14,15,22</sup> In addition general health, family history of LBP repetitive motions, increased growth rate, tightness or weakness of lower limbs, joints mobility range, trunk or pelvis musculature, increased or decreased physical activity level, increased BMI score, prolong sitting or watching television are also important factors in causing low back pain.<sup>13,16,19,20</sup>

School going children spend almost 30% of their time in school.<sup>16, 23</sup> The amount of time which they spend in class is of great importance.<sup>12</sup> Sitting position is often related in causing low back pain.<sup>12</sup> During lesson, students often sit awkwardly with their back flexed or rotated in one direction for long time.<sup>15,16</sup> So, the design of furniture and sitting positions are also considered very important contributing factors in causing LBP.<sup>12,23</sup> According to studies, low back pain limit activities of daily living in about 10%–40% of adolescents.<sup>10</sup> In addition to pain, spasms of paraspinal muscles are also common due to which restriction of

spinal movements occur.<sup>3,21</sup> The child experience problem in performing functional activities such as bending, lifting objects that ultimately results in severe back pain.<sup>10, 21, 22</sup>

Early onset of symptoms of LBP in adolescence is a strong predictor of LBP in adulthood and has serious future implications that can lead to chronicity.<sup>10,11,18</sup> In 90% cases of LBP, there is an underlying mechanical cause that resolves itself within two to eight weeks with mild treatment.<sup>8,11</sup> The best preventive approach in this regard is postural training and ergonomics awareness.<sup>2,12,23</sup>

Although data regarding the low back in school going adolescent may be found in the literature, still, data from the developing countries specially Pakistan is limited. Therefore, this survey was designed to find out prevalence of low back pain amongst school going children.

## METHODS

A cross sectional survey was carried out on school going adolescents who were between 11 to 15 years old (from sixth to eighth class) in private schools of Hayatabad, Peshawar. The study was conducted between September 2014 and February 2015. Convenient sampling was used as the sampling technique. Initially ten schools were approached for participation in the study but four schools refused to participate. A total of 628 children, both boys and girls participated in the study. However, data of 613 children were analyzed due to incomplete 15 questionnaires. The participants were categorized as having LBP if they answered positively to both of the questions present in Pre Shaded Minikin Questionnaire. By using symptom characteristics questionnaire of LBP, information was collected on intensity, duration, radiating pain and medical consultation. In addition, Hanover Low Back Pain Disability Questionnaire was used to assess limitations in nine daily activities. The items present in the questionnaire were categorized as mild limitation (0-1), moderate limitation (2-3) and severe limitations (4-9). Data was analyzed using SPSS version 20.0. Descriptive data was plotted on charts and Chi square test

was used to determine differences between both genders.

## RESULTS

A total of 613 students with 52% (n=319) girls and 48% (n=294) boys from private schools in Hayatabad participated in this survey. The mean age of participants was  $13.0 \pm 1.4$  years. The time prevalence of LBP in the selected population was 41.1% (n=252 population reported low back pain). There was no significant difference in prevalence rates between both genders. On 'Wong-Baker faces pain rating scale' the highest score reported by the children was 4 (**Figure 1**). Children reporting the score 4 were 48.8% of the sample, whereas those reporting the score 2 and 6 were 32.5% and 18.7% respectively. Of all the children with LBP, the intensity of pain increased with age. It was reported more by the children aged between 13 and 15 years. The chi square test value was found to be 0.005 which show significant association between pain intensity and gender of participants ( $P < 0.05$ ). The duration of LBP reported by children in "low back pain symptom characteristics questionnaire" was 94.0% and 6.0% for <12 hours and 12-24 hours respectively. On chi square test no significant difference was found between both genders ( $p > 0.05$ ). In 91.7% (n=231) of the subjects there was no radiating pain down the leg. Only 8.3% of the subjects (n=21) reported radiating pain down the leg (**Figure 2**). The chi square test yielded insignificant results for the association of radiating pain and gender ( $p > 0.05$ ). Among children with LBP, the consultation for any health care professional was minimal, only 7.9% of the children consulted doctor for LBP, 32.1% of the children consulted their family (other) for LBP whereas 59.9% of the children does not consulted any healthcare professional for their problem. No significant difference was found between both genders on chi square test ( $p > 0.05$ ).

The Modified Hanover Low Back Pain Disability Questionnaire (HLBPDQ) consisted of nine activities for which the disability score was given based on number of "yes" to each activity. The high activity limitation score for LBP was taken as  $\geq 4$ .

Asking about the activities included in HLBPdq, 63.1% answered “yes” to the “sitting on a school chair for a 45 minute lesson” activity followed by 62.3% for “carrying school bag” activity and 22.6% for “bending activities.” In addition to the above activities reported in Modified HLBPdq, high prevalence was also recorded for the following activities, “sitting up in bed from a lying position and sports activities at school,” the prevalence rates in both activities were 21.4% and 15.9% respectively. (Table 3).

In HLBPdq almost all the participants reported limitation in at least one or more activities. The activity

limitations were categorized as mild, moderate and severe, depending on the number of activity limitations (Figure 3). Mild limitation in activities was reported by 31.7% (n=80) of the participants. About 55.2% (n=139) of the participants reported moderate limitation in activities i.e limitation in 2 to 3 activities on HLBPdq whereas severe disability (limitation in 4 to 9 activities) was reported by 13.1% of the participants (n=33). (Table 4)

Among the participants with LBP, disability due to severe limitation in activities was reported more by 15 years old adolescents, this shows that limitation in activities due to LBP

increases with age. Regarding gender, moderate limitation in activities was reported more by girls than boys of the same age group (Table 4).

High pain intensity was reported in case of moderate to severe activity limitations which shows that with increase in activity limitation rise in pain perception also occurs. In addition medical consultation was seen more in participants (n=13) with high activity limitation score than in those with mild activity limitation score (n=0).

Figure 1. Intensity of pain

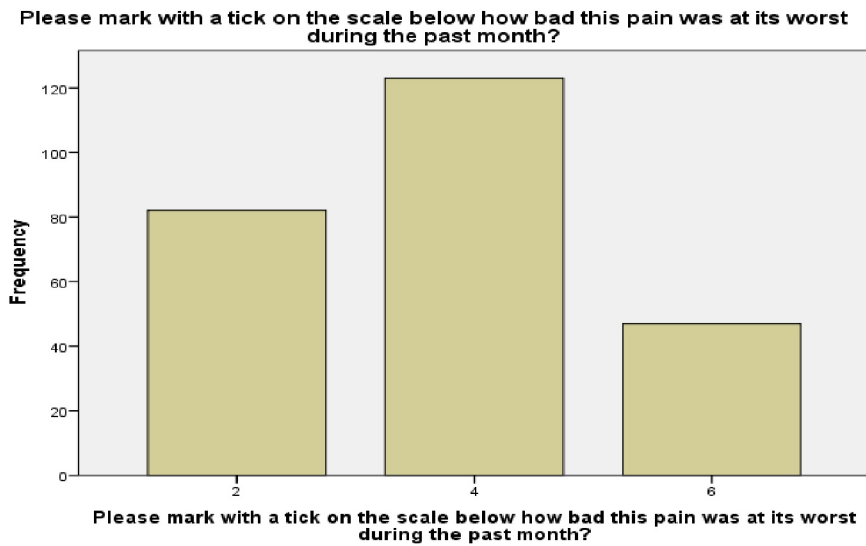


TABLE 3

Activities	Yes; N (%)	No; N (%)
Sitting on a school chair for a 45 min lesson	159 (63.1%)	93 (36.9%)
Carrying your school bag to school	157 (62.3%)	95 (37.7%)
Bending down to put your socks on	57 (22.6%)	195 (77.4%)
Sitting up in bed from a lying position	54 (21.4%)	198 (78.6%)
Sports activities at school	40 (15.9%)	212 (84.1%)

TABLE 4		
Variable		N (%)
HLBPDQ	Mild (0-1 limitations)	80 (31.7%)
	Moderate (2-3 limitations)	139 (55.2%)
	Severe (4-9 limitations)	33 (13.1%)
Gender Male	Mild	46 (18.3%)
	Moderate	59 (23.4%)
	Severe	16 (6.3%)
Female	Mild	34 (13.5%)
	Moderate	80 (31.7%)
	Severe	17 (6.7%)

Figure 2. Radiating pain down the leg

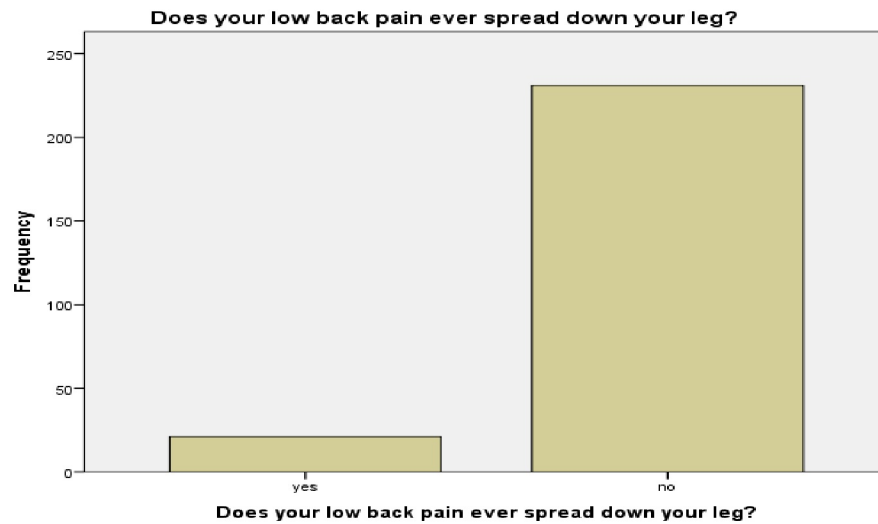
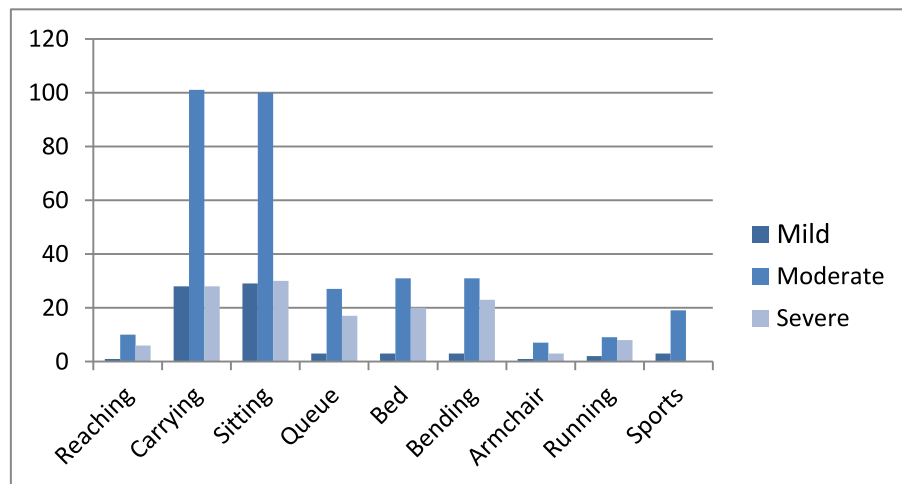


Figure 3. HLBPDQ



## DISCUSSION

This study has been focused on the prevalence of LBP in school children of age 11 to 15 years along with the symptom characteristics of LBP and associated disabilities. A total of 628 questionnaires were distributed among the school children with LBP. Because of systemic issues and incompletely questionnaire only 15 questionnaires were rejected which show that participation rate was high i.e about 97% to 98%. One month period prevalence was found to be 41.1% which is much higher In contrast to other studies.<sup>3,8,9,10,14,30</sup> There were no significant differences in prevalence rates between girls and boys while other studies reported high prevalence rates in girls as compared to boys.<sup>3,8,9,30</sup>

In this study there was a slight increase in prevalence rates as the age increased. At the age of 11, the prevalence of LBP was about 28.1% whereas at the age of 15 the prevalence was about 34.6%. LBP was found at its maximum at the age of 13 and the prevalence rate reported was about 53.8%. So, the findings of this study can also be co-related to other studies in which prevalence rate increased with age.<sup>3,8,14,30</sup>

In majority of the participants (94.0%) the duration of LBP lasted for < 12 hours. The results found were in contrast to other studies in which the duration of LBP was more.<sup>3, 8</sup> In comparison to other studies, less number of children (8.3%) reported radiating pain down the leg, but activity limitation was more in these children.<sup>3,8</sup>

In children with LBP, modified HLBPDQ was used to assess limitation in nine daily activities like reaching, carrying, sitting and bending etc. Among children with LBP high activity limitation score was noted in sitting on a chair for a 45 minute lesson (63.1%) and carrying school bag (62.3%). The results were almost similar to those noted in other studies.<sup>3,8,13,29,30</sup> In addition this study also reveals less association between sport activities and LBP.<sup>6</sup>

This study had a number of limitations that should be considered.

Primary limitation of this study is that few schools refused to participate in the study. Secondly, questionnaire does not contained questions about weight and height of children. Also, there were no questions about weight of backpacks and seating ergonomics used in classrooms. These factors can somewhat influence the data.

Steps should be taken to raise awareness among children, parents and community about LBP and its future consequences and the role they can play in reducing this problem Parents should regularly ask from their children about the activities causing back pain or fatigue. If the child complains of low back pain then the parents should make sure regular visits to doctor and physical therapist to prevent future chronic LBP. In addition further researches should be done in school children to investigate the influence of overweight backpacks and school furniture i.e seating ergonomics on children's spine and related disability and to develop additional scientific evidence.

## CONCLUSION

The present study involved a large cross sectional sample of children attending private schools of Hayatabad, Peshawar. The study shows that the prevalence of LBP in school children, especially adolescents is high, which is markedly affecting daily activities of children and is also leading to associated disability. Although medical consultation was low, but LBP should not be ignored in order to prevent its future consequences. Future research work on school children especially in primary and secondary classes is also required to further confirm these results.

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