

Prevalence of Back Pain among high school students: A cross-sectional study in Dubai, United Arab Emirates

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ABSTRACT

Introduction: Back pain among high school students all over the world is on the rise. It is one of the most underestimated public health problems in today's generation.

Objective: The research was performed to determine the prevalence of back pain among high school students in Dubai, UAE.

Materials and Methods: The study was done using convenience sampling, including a total of 184 students, both male and female from the grades 9 to 12. They were asked to fill out questionnaires which included a consent form to be signed by the parents. Descriptive statistics was performed to express the results.

Results: The results showed that more than half of the total population suffered from back pain. Furthermore, the results obtained established a link between various other variables such as the affected region and muscles of the back, age, grade (9-12) and gender. Considering the anatomical aspects of the back pain experienced, the region most affected as self-reported by the students, was the neck. Adolescents who belonged to 17 and above age group were reported to be more susceptible to back pain.

Conclusion: Back pain was more prevalent in females than in males. Prevalence of back pain is a major issue in today's generation and awareness among the students is highly essential for early prevention.

Keywords: Back pain, students, prevalence

INTRODUCTION

Low back pain is defined as 'neither a disease nor a diagnostic entity of any sort'. The term referred to pain of variable duration in an area of the anatomy afflicted so often that it had become a paradigm of responses to external and internal stimuli¹. The classification of back pain is based on either duration of persistence of symptoms; acute lower back pain (lasted less than 6 weeks), sub-acute lower back pain (lasted between 6 and 12 weeks) and chronic lower back pain (lasted more than 12 weeks) or on etiology; mechanical or non-specific lower back pain (no underlying pathology) and secondary lower back pain (associated with underlying pathology)². Various superficial muscles present in the back which contribute to back pain include the trapezius muscle, latissimus dorsi, the rhomboid major and minor muscles and the muscle gluteus maximus³.

A study in Al Ain reported 59% prevalence of low back pain⁴, which is a rather large percentage. A prevalence of 68% was found in medical students in UAE University, Al Ain⁵. This further reflected that younger age groups are getting affected with back pain and the pain is getting aggravated as students got older and advanced further.

Studies exhibit great variability in prevalence rates, with estimates ranging from 1.1% -66%^{6,7}. This variability may be due to differences among the studies in such factors as the age of the sample, sample size, definition of back pain, recall period, strategy for extracting data, methodology used⁷.

Among adolescents, back pain was a pressing issue since it seemed to be constantly on the rise. School age children are at a high risk for major back problems if they started with back problems early on. The basis of this research was to hopefully increase awareness of this important issue, and attempt to rectify it before it caused major problems for children in the future, one of them being chronic back pain. Furthermore, in order to avoid the harmful consequences of back pain, early prevention is essential. The main objective of the study was to determine the prevalence of back pain among students of grades 9 to 12. Secondly, the association of back pain with regard to the affected region and muscles of the back, age, grade (9-12) and gender was assessed.

MATERIALS AND METHODS

The study was a cross-sectional study involved surveying high school students in Dubai, UAE. The high school students were selected from grades 9 to 12. The age group of these students ranged from ages 12 to 18 years. According to a study done in Al Ain, UAE, the prevalence of back pain was 59%⁴, and using this value in the sample size formula, a total of 260 was obtained. A total of 3 schools were included in the study and 184 students participated in the research.

Sample population was selected using convenience sampling. Both genders were included in the study; also various nationalities of participants were included. The research proposal was approved by the Research and Ethics Committees. Confidentiality and anonymity of the students was maintained. Consent had been given by the respective schools to carry out the study among their students, and parents of the students in order to give permission to their children to take part in the study. Gender and age were considered the independent variables while the affected region and muscles was considered the dependent variable. The instrument

chosen was a self-administered questionnaire, as it is the least time consuming and most feasible method for children. The data was entered in Microsoft excel and was then imported to statistical program for social sciences (SPSS version 20) for analysis. The data was analyzed to determine the prevalence of back pain. Bivariate analysis was performed to observe strength of association between the independent and dependent factors and was analyzed by using the Chi Square test ($P < 0.05$ would be considered statistically significant).

RESULTS

This study was conducted to determine the prevalence of back pain among high school students. A total of 184 students participated and included both males and females from grades 9 to 12 from three different schools.

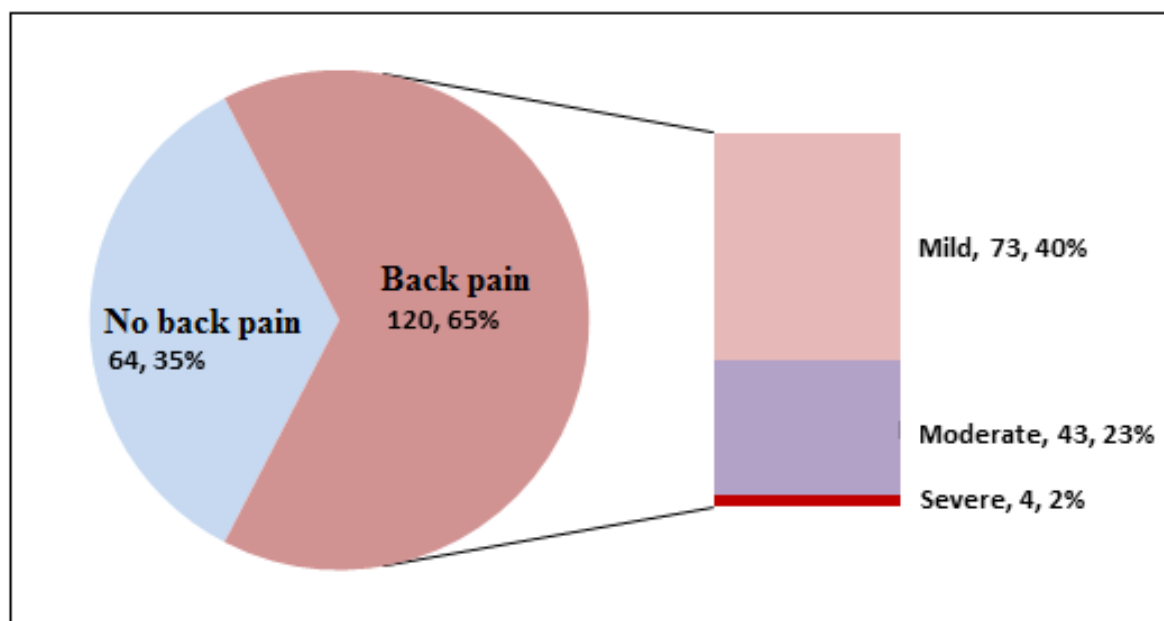


Figure 1: Prevalence of self-reported Back pain among the participants. (N=184)

In the student population studied, 65% reported back pain and the majority (40%) had a self-reported mild form of back pain. This was followed by 23% students who had moderate pain and a small percentage, 2%, who had severe back pain. Details are given in figure 1.

Table.1: Distribution of onset and peak of back pain among the participants. (N=120)

| Variables | Groups | No. | % | Non response |
|-----------|---------------|-----|------|--------------|
| Onset | <1 year ago | 17 | 21.8 | 27 |
| | 1-3 years ago | 52 | 66.7 | |

| | | | | |
|--------------|--------------|-----|------|---|
| | >3 years ago | 9 | 11.5 | |
| Peak | | | | |
| Morning | Yes | 23 | 19.7 | 3 |
| | No | 94 | 80.3 | |
| School hours | Yes | 40 | 34.2 | 3 |
| | No | 77 | 65.8 | |
| Evening | Yes | 71 | 60.7 | 3 |
| | No | 46 | 39.3 | |
| Bed time | Yes | 16 | 13.7 | 3 |
| | No | 101 | 86.3 | |

Table 1 describes the distribution of onset and peak of back pain among the participants. Onset of back pain which was 1-3 years ago was found to be the complaint of 66.7% of the participants. About 21.8% had it less than a year ago and only 9 students (11.5%) reported that they had an onset of pain more than 3 years ago. This observation does not show any specific trend.

Peak time of pain was mostly during the evening (60.7%), which was followed by 34.2% students who experienced pain during school hours, 19.7% felt pain in the mornings and the least was bed time (13.7%) respectively.

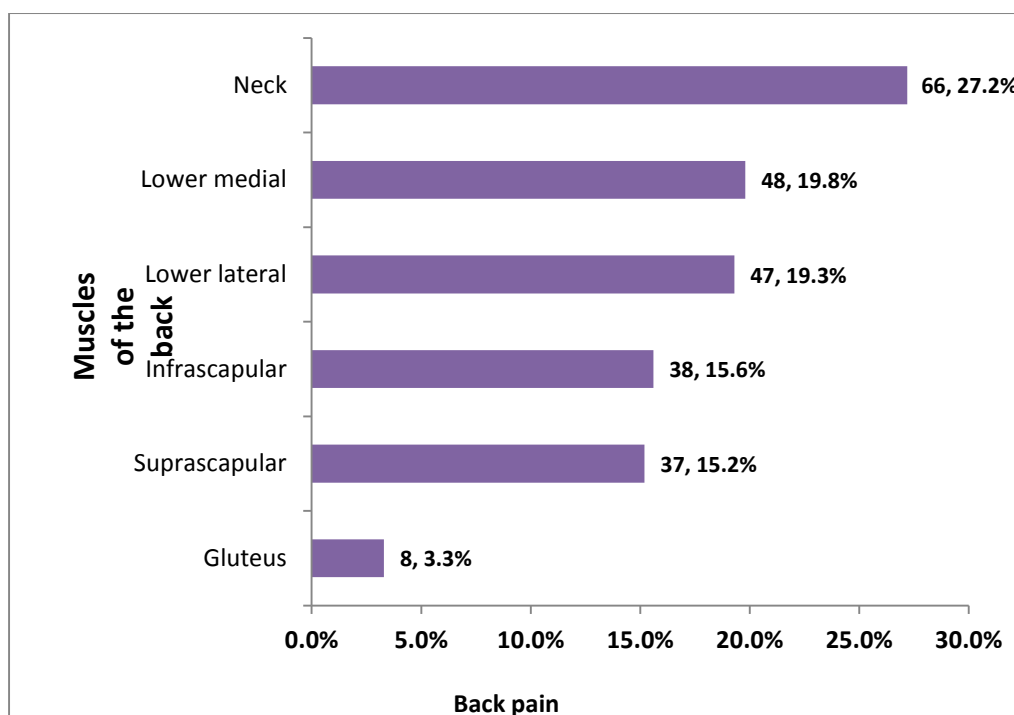


Figure.2: Distribution of pain according to affected regions of the back. (N=120)

In order to determine in which region and muscle the pain was felt most accurately, the students were given a picture of the back and asked to tick the most appropriate or closest region. 27.2% students reported pain in the neck region, which was the majority, followed by lower medial (19.8%) and lower lateral (19.3%) respectively. Infrascapular and suprascapular regions were reported by 15.6% and 15.2% students respectively. Very few students, 7.1% reported that they had pain in the gluteal region. The details are given in figure 2.

Table.2: Comparison between socio-demographic characteristics and back pain. (N=120)

| Socio-demographic characteristics | Groups | Back Pain | | No back pain | | P value |
|-----------------------------------|------------------|-----------|------|--------------|------|---------|
| | | No. | % | No. | % | |
| Age group (in years) | ≤14 | 32 | 56.1 | 25 | 43.9 | NS |
| | 15-16 | 64 | 64.6 | 35 | 35.4 | |
| | ≥17 | 24 | 85.7 | 4 | 14.3 | |
| Gender | Male | 40 | 51.3 | 38 | 48.7 | <0.01 |
| | Female | 80 | 75.5 | 26 | 24.5 | |
| Grades | 9 th | 24 | 54.5 | 20 | 45.5 | NS |
| | 10 th | 34 | 64.2 | 19 | 35.8 | |

| | | | | |
|------------------|----|------|----|------|
| 11 th | 33 | 63.5 | 19 | 36.5 |
| 12 th | 29 | 82.9 | 6 | 17.1 |

Table 2 describes the comparison between socio-demographic characteristics and back pain. Age of students ranged between 12 and 18 years. There was a trend observed in the percentage of self-reported back pain and their respective age. As the age increased, back pain increased. It was observed that 85.7% in the age 17 and above category reported back pain, which was followed by 64.6% students in the 15-16 age range and 56.1% below 14 years of age. A statistically significant association was observed between age of the participants and back pain.

Females (75.5%) experienced back pain as compared to males (51.3%). Also, in each grade, females were still found to be experiencing back pain more than males. However, a trend is not seen with increasing grade.

DISCUSSION

Back pain is an underestimated problem among adolescents. This study assessed the prevalence of back pain and associated variables. These variables include age, gender, and affected muscles of the back, besides these, frequencies of onset and peak of the back pain were also studied.

There was a high prevalence of back pain found within the high school students. A study in Al Ain, UAE reported 59% prevalence of low back pain⁵, and 68% of the population was found to be experiencing back pain in a study conducted by UAE University, Al Ain. Other studies exhibit great variability in prevalence rates, with estimates ranging from 1.1% -66%^{6,7}. This variability may be due to differences among the studies in such factors as the age of the sample, sample size, definition of back pain, recall period, strategy for extracting data and methodology used⁷.

Back pain among school age children, particularly adolescents has been rising alarmingly⁸. So much that it was almost on equal footing with the prevalence of the back pain in the adult population. Lifetime of prevalence of back pain can reach up to 70-80%⁹. Another study observed that, where over a couple of years out of all the children who participated 20% have shown an increase in incidence of back pain.¹⁰ All this research further solidifies the increasing issue of back pain in children and adolescents, and that it deserves to be investigated and controlled.

Evidently, it should not start so early, as it usually only gets worse with age. Therefore, the earlier the onset of back pain, the worse it would be in the future. Furthermore, a study stated that acute back pain was more common and did not lead to 'disabling consequences' when compared to pain of a chronic nature.¹¹ However, the results obtained showed a higher number of cases of chronic back pain, i.e. onset 1-3 years ago. The peak time at which the back pain was felt showed a trend which indicated that as the day progresses students tend to feel the pain. This, however, could not be backed up with other studies as no study establishes the frequency of back pain among high school students.

The students were given a choice of six regions of the back to choose from in order to specify where they felt the pain. The most popular response was the neck region, followed by lower medial back. Neck strain can cause 'hyperextension of the lumbar spine' which could result in lower back pain¹². For this reason, neck and lower medial regions of the back were the two most common areas of pain. Furthermore, 'the muscles involved in the neck that are at risk of getting injured are the anterior, medius and posterior scalenus muscles. These muscles elevate the 1st and 2nd ribs and also laterally flex and rotate the cervical part of the vertebral column³.

A five year study on adolescents of age 12-16 was performed and the result showed an increase of annual incidence of back pain of 12% at the age of 12 and 21.5% at the age of 15¹³. The results obtained in this study showed that students above the age of 17 reported the most which is similar to another study¹⁴. A study states that newer generation children suffer from back pain much earlier in their life than past generations¹⁵. According to another study, the adolescents experience more pain just before and after onset of puberty¹⁶. On the contrary, the occurrence of back pain among students aged 17 could be due to other factors like carrying heavy bags rather than weak muscles.

Among the genders, it was found that only 38.5% of the males suffered from back pain compared to 70.8% of the females. Studies show more prevalence of back pain among females than among males^{17,18}. Similar results were also seen in another study¹⁹. According to a study, during puberty due to high amounts of testosterone and IGF-1 in males, development of muscles is much more than compared to females. High levels of oestrogen in females increase development of bone mass than muscle mass, hence, making women more susceptible to back pain²⁰. Grade 12 students reported to have more back pain in comparison to grades 9-11. It was also noted that in all grades females affected more than males.

In order to avoid the harmful consequences of back pain, early prevention is essential. Although various control methods have been suggested and applied, a study showed that only a few were effective²¹. Based on the results, preventative methods can be followed in order to reduce the prevalence of back pain in the future. Educating children and parents about the consequences of back pain by running awareness campaigns is one of them. There are also benefits of exercise in controlling back pain in children. A recent study was performed where the chosen children were made to follow a routine exercise pattern so they could test at the end of it if the intensity of back pain has reduced. The conclusion was that there was a decrease in the pain in a percentage of the children²². This can be co-related to this study on back pain prevalent in high school students and steps that can be used in order to control or prevent it all together by promoting a healthier lifestyle which includes everyday exercise children can make them more aware of distress caused by back pain. Also, since not many adolescents live in the vicinity of their schools, taking the metro would be a better alternative as this includes walking to the metro station. These methods were advised by an orthopedic doctor, and a few of our personal recommendations on how back pain can be reduced.

There were a few limitations encountered in the study. Out of the sample size, only 184 could be achieved. There was also recall bias. Since the students were asked events of their past, there was a chance of them not being completely certain of what they have answered. Also, cause-effect relationship could not be assessed since it was a cross sectional study.

CONCLUSION

The conclusive result of this study performed on high school students was that 57% of the participants reported back pain, most often in the neck region. The number of females who reported that they had back pain was greater than males. There was an increase observed in the female students who reported back pain with an increase in their grade.

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