DOI: 10.55735/hjprs. v3i5.94

THE HEALER
Journal of Physiotherapy & Rehabilitation Sciences

Original Article

Self-Reported Neck Pain and Associated Risk Factors Among Adolescent Madrassa Students in Karachi, Pakistan; A Cross-Sectional Study

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ABSTRACT

Background: Neck pain is the most common health issue, more prevalent in adolescents and they are susceptible to chronic neck pain in the future. This pain is caused by various modifiable and non-modifiable risk factors in young adults, including physical and functional factors, although head posture is the prime causative factor among them. **Objective:** To determine the frequency of neck pain and its associated risk factors among adolescent madrassa students of Karachi, Pakistan. **Methods:** An observational cross-sectional design had been conducted by using non-probability purposive sampling and the sample size of 378 was calculated by using Open-Epi version 3.0 with a confidence level of 95%. The written consent and questionnaire consisting of part A demographics and part B of questions regarding posture, study duration and pain frequency were filled by each student while considering the ethical considerations. Frequency and percentage were calculated for all qualitative variables. The chi-square test was applied to identify the association between different variables while p-value≤0.05 was considered as significant. **Results:** Neck pain frequently occurs in both gender and out of 378 individuals, 354 (93.6%) respondents had neck pain while only 24 (6.34%) reported no pain. According to this study, neck pain is more prevalent in females (96.7%) as compared to males (90.8%). The numerical pain rating scale showed that 112 (61.5%) of the 182 females suffered mild pain, 60 (32.9%) had moderate and 4 (2.19%) reported severe neck pain. Among 196 male respondents, 89 (45.4%) reported mild pain, 20 (10.2%) suffered severe pain, and 18 (9.1%) had no pain. Impaired head alignment while studying, prolonged study hours without a break and flexed neck posture despite sitting are the contributing risk factors for having neck pain.

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Keywords: cervicalgia; disability; ergonomics; lifestyle; neck pain; posture

Citations: Aziz H, Siddique F, Aziz S, Nawaz U, Alam M, Paracha H. Self-reported neck pain and associated risk factors among adolescent madrassa students in Karachi, Pakistan; A cross-sectional study. The Healer Journal of Physiotherapy and Rehabilitation Sciences. 2023;3(5):524-531.

DOI: 10.55735/hjprs. v3i5.94

Conclusion: Bad posture, poor sitting ergonomics,and prlong study duration are the key factors for causing neck pain. It also concluded that the majority of the population (93.65%) was having neck pain whereas only 6.35% of adolescent students had no cervicalgia.

INTRODUCTION

Neck pain or cervicalgia is one of the most common and major public health issue.[1,2,3] It may develop due to muscular stiffness or nerve compression in both the cervical muscles and upper back as the head movement and posture are maintained by the lower neck and upper back muscles.[4] This pain can radiate from vertebrae in the cervical region due to the constriction of the nerves and is also generated by the disruption of the joints in the neck.[5] It causes a significant proportion of disability all over the world.[1] Globally, it is ranked as the 4th highest contributor to disability measured in years lived with disability (YLDs).[6]

In addition, neck pain among adolescents is ranked 8th cause of YLDs according to the data estimated by the World Health Organization as global burden of disease study.[7] Emerging evidence demonstrates that neck pain is highly prevalent and frequent in adolescents.[8] The worldwide impact of 1-year prevalence among juveniles ranged from 34.5% to 71.5% [1]. However, a systematic review of studies illustrated substantial evidence of neck pain in adolescents aged 12 to 18 years.[9,10] Hogg Johnston asserted in his research that gender, age, and genetics are non-modifiable risk factors.

However, modifiable factors included mental health problems such as depression/anxiety, tobacco exposure and smoking. These modifiable and non-modifiable factors have shown a significant prevalence of neck pain.[9] Furthermore, the literature review reveals that neck pain is associated with some other risk factors as well among that poor posture control, long study hours, postural deviations and head postures are more common functional and physical risk factors.[11-16] Inappropriate postures and neck flexion during sitting can lead to distress of the neck muscles.[17-19]

Cervicalgia can occur at any stage of life but in adolescents, the tenacious pain may increase the risk of chronic pain in the future and in adults with a considerable proportion of 19 to 37%.[20,21] There were various studies done to determine the frequency and associated risk factors of neck pain for further clinical research and gathering data relevant to young people, thus acquiring more susceptibility to neck pain, risk factors and variables.[20,22,23] The purpose of the current study was to determine the frequency of neck pain and its associated risk factors among adolescent madrassa students of Karachi, Pakistan.

METHODS

An observational cross-sectional study has been conducted from July to Oct 2020 to determine the frequency of neck pain associated with risk factors among adolescent madrassa students. A non-probability sampling technique has been used and a sample size of 378 was calculated by using an Open Source Epidemiologic Statistics for Public Health (OpenEpi) calculator version 3.0 with a 95 % level of confidence.

The data has been collected from the Madrasa of Banori town, Darul UloomKorangi, Ashraf-ul-madrasa Karachi by the students aged between 12 to 18 years excluding the students with previous neck or shoulder injury, trauma, surgery and any other pathological condition. Informed consent was given to participants

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before the study noting the ethical considerations. After taking consent a self-generated, closed-ended questionnaire was distributed among them. A questionnaire includes section A which consists of demographics and section B which includes questions regarding posture, study hours, postural changes while studying, neck movement, stiffness felt while studying and pain frequency. The questionnaire was completed in less than 20 minutes. Data were analyzed by using the statistical project of social science (SPSS) software version 26.0. Frequencies and percentage was calculated for

Figure I: Age Distribution of Madrassa Students

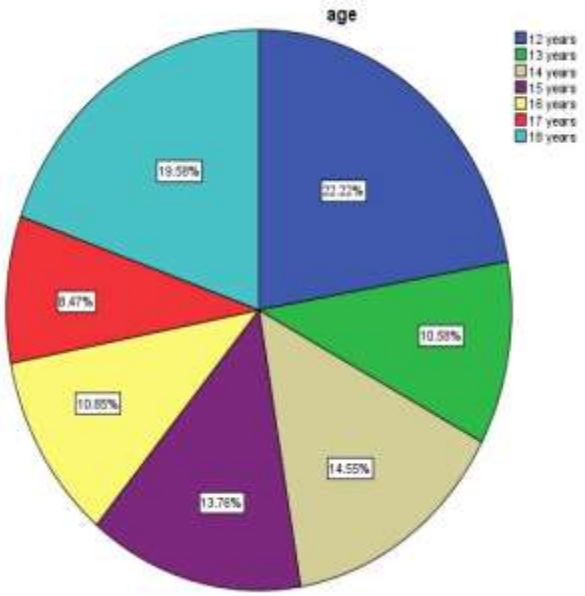

Table I: Total Study Hours Per Day and Hours of Continuous Study of Madrassa Students

		Frequency	Percentage (%)
Duration of study	2 - 4 years 5 - 6 years 7 - 8 years 9 - 10 years	236 59 36 47	62.4 15.6 9.5 12.4
Hours/day	5 - 6 hours 7 - 8 hours 9 - 10 hours 11 - 12 hours	157 80 82 59	41.5 21.2 21.7 15.6
Continuous study hours daily without any break	2 hours 3 hours 4 hours 5 hours	94 171 69 44	24.9 45.2 18.3 11

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all qualitative variables. The Fisher exact test was applied to identify the association between qualitative variables, where the p-value≤0.05 was considered as significant.

RESULTS

Out of 378 subjects who participated in this study, 196 (51.85%) were males whereas 182 (48.15%) were females. The participants' age ranges from 12 to 18 years, however 22.22% were of 12 years of age (Figure I). Duration of studies at madrassa for most of the participants (62.4%) included in our study was for 2-4 years. However, amongst all the participants, 41.5% studied at the madrassa for 5-6 hours whereas 21.2% were studying for 7-8hours and 21.7% were studying for 9-10 hours, respectively. Furthermore, daily continuous study hours at madrassa were 3 hours for 171 students (45.2%), while just 44 (11.6%) studied constantly for 5 hours (Table I). There was change of posture during study among 279 (73.8%) participants. However, only 13 (3.4%) never changed their posture during studying.

Figure II: Postural and Neck Change

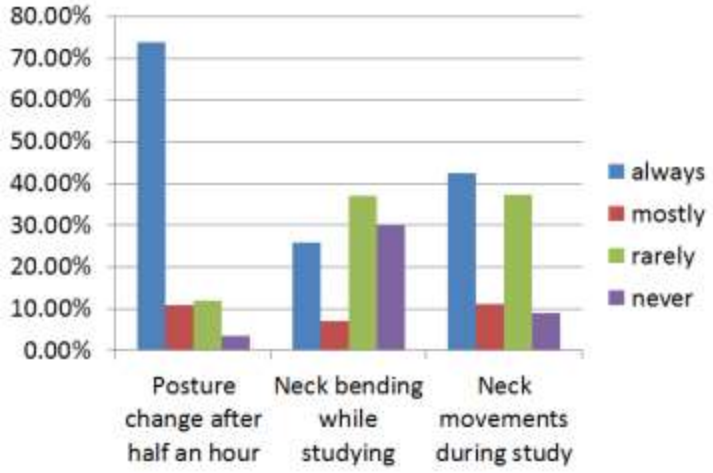

Figure III: Association Between Gender and Severity of Pain on NPRS

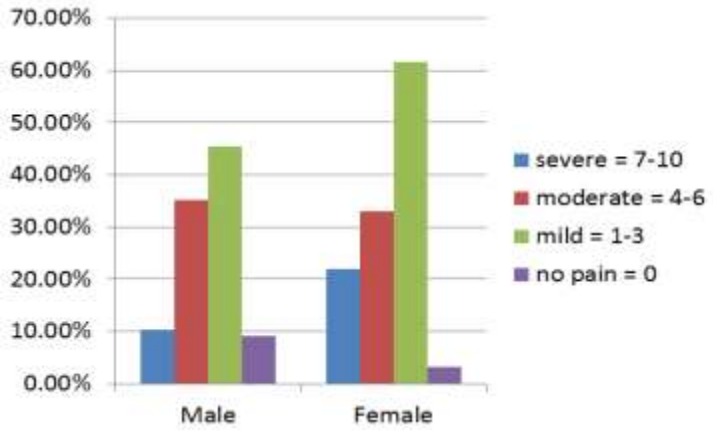

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Figure IV: Association Between Age and Severity of Pain on NPRS

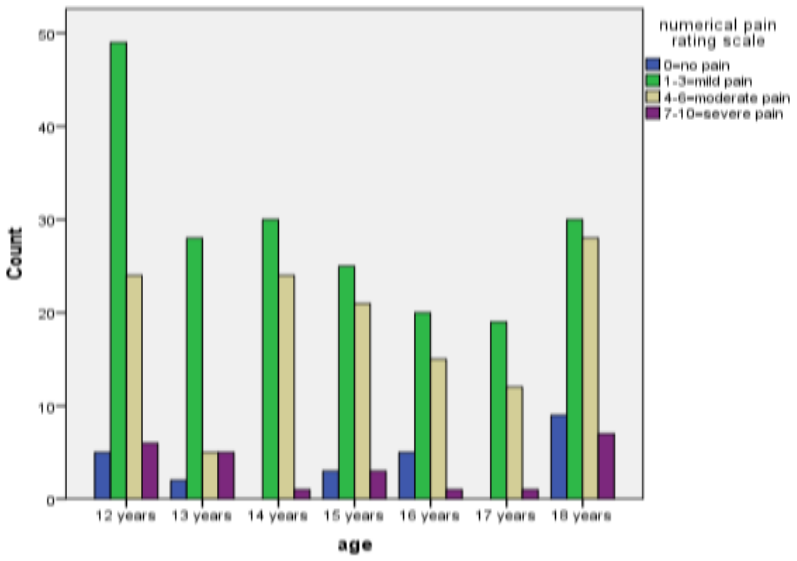

Table II: Association of Gender, Age and Study Duration with NPRS

Variables	p-value
Association of gender with NPRS	0.05
Association of age with NPRS	0.05
Study duration hours association with NPRS	0.02

While the other 140 students (37%) rarely bent their necks and 98 (25.9%) study without bending their necks. Furthermore, 161 participants (42.6%) did neck movements in forward and backward position and 141 participants (37.3%) rarely moved their necks (Figure II).

The results revealed that neck pain is more prevalent in females (96.7%) as compared to males (90.8%). The NPRS indicated that out of 182 female participants 112 (61.5%) had 4 (2.19%) individuals had severe neck pain. Of 196 male responders, i.e. 89 (45.4%) were suffering from mild pain, 20 (10.2%) experienced severe pain and 18 (9.1%) had no pain (Figure III).

This study showed that mild neck pain is most prevalent in adolescents aged 12 years i.e. 49% and students of age 18 years complained the most for severe pain among all age groups (Figure IV). Fisher exact test was used to assess the association between gender, age, study duration hours at the madrasa and the severity of pain on the NPRS which showed that there was significant association between gender and age therefore, p-value=0.05 for

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both demographics respectively. While in the association between the NPRS and study duration hours at the madrassa, the p=0.22 i-e insignificant and no association is found, therefore null hypothesis was rejected.

DISCUSSION

Neck pain is a perturbing condition for all age groups people. However, poor postures lead to a degenerative phenomenon that causes nerve compression in young and adolescents. A study conducted among the school children of Southern Finland findings illustrated that neck pain is the most prevalent non-traumatic site of pain. It also unveiled that neck pain is prevalent in 93.65% of the population whereas only 6.35% of adolescent students reported no cervicalgia.[13] So it is noteworthy that neck pain can never be ignored in any age group or any gender. Furthermore, a study was conducted on Lebanese age below 18 years with nonspecific neck pain.

The results revealed that females reported more neck pain i-e 57% as compared to males 43%, while adolescents marked 60% than children 40%. The neck pain is more common among females, which shows a noticeable relationship between neck pain and gender but no evident association exists between neck pain and age.[2] A study was intended on undergraduates of Lahore to determine the prevalence of neck.

Study results showed that no direct relationship exists between neck pain and sex difference but a weak association exists between age difference and neck pain.[24] The study comprised 250 student participants aged 12 to 18 years old, with around 48.1% girls and 51.9% boys. They all reported neck pain and 72.3% exhibited inappropriate neck muscle flexion and a hunched head while studying.[25] Adolescents with pain in the neck have less forward head posture; therefore, it concludes that postural changes and endurance of neck muscles are the common characteristics of patients having a complaint of neck pain.[5] Another study's findings suggest that neck disability rate is directly proportional to forward head posture and they explained that forward head posture occurred due to a decrease in craniovertebral angle.[26]

Another study conducted in Iranian concludes that there is no correlation exists between neck pain and head posture while thoracic curve (kyphosis) abnormalities are accompanied by neck pain. So there is a need for further studies to know the real phenomenon behind neck pain and posture.[27] As far as the relationship between posture and pain is obscured, it is found that a significant correlation is possessed between neck pain and postural changes. Those who suffered from neck pain are more concerned regarding their posture and the literature review also proved that those who have neck pain are more aware of posture and follow the possible strategies to overcome this symptom. A study was conducted to do a comparison between habitual sitting posture, perception of good posture and postural repositioning of the upper and mid-back. Results reveal that the participants with neck pain have a different perception of good posture.[9]

Perhaps a study that examined neck pain and studying posture of students in madrasa classrooms found that classroom posture is a major cause of pain but a study conducted among school students to examine neck pain and their findings suggested that there is no relationship exists between the posture of students in the classroom to the development of musculoskeletal disorders like neck or back pain. Student posture, anthropometrics, furniture, computer usage, pain reporting and vision were the variables that were considered but they did not find any evidence that the relationship between poor sitting posture in

school which is the cause of neck and low back pain in adolescent's work hours.[14]

Other most implicated predisposing factors include prolong reading hours i.e. 31.4% and poor self-perpetuating factors 16.6%. The most common activities that limit the daily activities of students include reading 49% and 27.9% concentration on schoolwork. Since the study is conducted on the particular madrassas of Karachi, the results can not be generalized to all madrassa students who studied more than three hours without doing head movements and changing their posture. Therefore, there is still a need to conduct more studies to obscure the exact cause and to establish the proper coping strategies to avoid neck pain and spread awareness regarding good posture among students.

CONCLUSION

Bad posture, poor sitting ergonomics and prolong study duration are the key factors for causing neck pain. The results also concluded that the majority of the population that is 93.65% was having neck pain whereas only 6.35% of adolescent students had no cervicalgia.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.
Availability of data and materials: Data will be available on request. The corresponding author will submit all dataset files.
Competing interests: None
Funding: No funding source is involved.
Authors' contributions: All authors read and approved the final manuscript.

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