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Prevalence of Upper Cross Syndrome In Medical Students of Women Medical College, Abbottabad, Khyber Pakhtunkhwa, Pakistan

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Abstract

Upper Cross Syndrome is a common muscular imbalance involving head, neck and shoulder region. It exhibits a common postural disruption linked with tonal abnormalities of the pectoral girdle musculature and cervicothoracic part of the body. This syndrome is characterized by neck pain and its restricted range of motion, forward head posture and rounded shoulders. It is usually seen in persons who work for longer period of time in misaligned body position. This study was intended to check the prevalence of Upper crossed syndrome in medical students of Women Medical College, Abbottabad. For this purpose, a descriptive cross-sectional survey was conducted. A total of 305 students of age group 18-25 years were recruited. Data was sought in two phases. In the first phase, participants were asked to fill a self-designed questionnaire containing demographics and other symptomology of Upper Cross Syndrome which included pain in neck region, duration of study hours, frequently used electronic gadget for study, total study hours, stiffness around neck and chest, area and type of pain while studying and presence of headache. In the second phase, restricted neck range of motion was assessed using a goniometer, forward head posture was checked using the wall and ruler and posture analysis was done to check for rounded shoulders by a physiotherapist. The study employed convenient sampling technique for data collection. The data was first entered and then analyzed by SPSS version 22 software which fetched percentages for each variable. In order to find whether any correlation between the two variables exist or not, a chi-square test was conducted using SPSS version 22 and values were interpreted (p -value < 0.05). As a result, among the 305 subjects, 72.13% felt tightness around the neck while 36.07% students reported pain in neck after prolong usage of either mobile phone or laptop. Subsequent restriction in range of motion of the neck was reported by 32.13% participants. About 47.86% subjects who filled the questionnaire were diagnosed with rounded shoulders after a detailed posture analysis by a physiotherapist. Among those 47.86% subjects, moderate pectoral muscle stiffness was reported by 67.45% students while 19.6% had severe pectoral stiffness. Forward head posture was observed by the physiotherapist utilizing wall and ruler method in 84.5% of all the participating subjects. Among the recruits who experienced any sort of neck or shoulder girdle pain, 20% reported using pain killers for relief, 7.21% have had physiotherapy treatment protocol while 72.79% took no treatment at all. Thus it was concluded that a significant number of medical students in Women Medical College, Abbottabad were suffering with Upper cross syndrome either due to excessive smart phone usage or poor study posture.

Keywords Upper cross syndrome (UCS), cervical, shoulder, musculoskeletal (MSK), forward head posture (FHP).

1. Introduction

“Upper Cross Syndrome” (UCS) commonly interchangeably used as “Cervical Crossed Syndrome” or “proximal/shoulder girdle cross syndrome” is a

common muscular imbalance involving head, neck and shoulder region. It exhibits a common postural disruption usually seen in persons who work at table, use laptop computers, desktops, tablets and similar

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gadgets and in those who use mobile phone, sit for longer period of time in misaligned body position e.g. reading, driving and watching TV (1-4).

It commonly refers to an imaginary “X” drawn through the shoulder and cervicothoracic area of a person’s body. One line of the cross denotes muscles which are short/overly facilitated (tight sub occipitals, levator scapulae and upper trapezius posteriorly with taut pectorals in front) and other line denotes lengthened/overly inhibited muscles (weak neck flexors in front along with weak rhomboids, middle and lower trapezius at the back). This disproportionality leads to joint impairment specifically at Atlanto-occipital region (OA), C4/C5 region, C7/T1 region, Glenohumeral joint area and T4/T5 region. The conditions such as rounded/protracted shoulders, neck pain, forward head posture and restricted range of motion of neck primarily are the risk factors for this misalignment (2,3).

Chronic postural stresses in the upper part of the body that necessitates us to perform daily activities in a position requiring flexion of upper spine, protracting head, protracting the shoulders and internally rotating the arms is considered a major cause. Thus, adapting such posture for prolonged time makes it mandatory for certain muscles to contract and ultimately shorten while others to lengthen and hence, weaken (3).

Patients of UCS mostly report to the therapist when the condition has already progressed to chronic stage but if proper regimen and care given, the syndrome does respond well to treatment. In order to prevent UCS, avoidance of activities that cause a forward head and roundness of shoulders is the key (3,4).

A study conducted in 2016 among medical students of University of Lahore found a relationship between upper cross syndrome and associated impairments and poor posture. They observed that 48.7% participants reported pain in neck and 66.8 were involved to adapt a poor study posture. It was also observed that the subjects having UCS were in one way or other related to poor posture. They were involved in actions which made them to take up a posture of high energy value subsequently directing towards UCS and thus the prevalence of the respective disease in the participants was concluded as 37.1% (5).

Another survey was designed in 2015 in order to find the prevalence and risk factors for the development of Upper-Crossed Syndrome (UCS) among DPT students of University of Lahore. Among the 244 subjects, the

study concluded that 30-40 participants were experiencing cervical region pain, stooped posture and protracted shoulders along with significant thoracic area pain and were at an increased risk of developing Upper Cross Syndrome (6).

2. Methodology

2.1. Operational Definition

Upper Cross Syndrome: It is a condition characterized by pain and stiffness in neck, forward head posture and rounded shoulders. These postural disturbances create muscle imbalance due to faulty body mechanics and further leads to symptoms such as headache, stiffness around chest and neck instability if not treated properly.

2.2. Study Design

This was a descriptive and cross-sectional study. It was carried out at Women Institute of Rehabilitation Sciences, Abbottabad. Convenient sampling technique was used to draw the sample size. Inclusion criteria for participants were (a) all the students of Women Medical College, Abbottabad who freely accept to take part in the study, (b) 18-25 years of age, and (c) female participants. The exclusion criteria for samples were (a) History of upper body trauma, (b) history of any structural or congenital postural deformity, (c) students other than Women Medical College, Abbottabad, and (d) male participants.

2.3. Sample Size

A sample size of 305 participants was deemed appropriate which was calculated using Raosoft online sample size calculator.

2.4. Study Population

The study population was the medical students of Women Medical College, Abbottabad who fulfilled the inclusion criteria of the research.

2.5. Ethical Considerations

The study was approved by ethical review board of Women Institute of Rehabilitation Sciences, Abbottabad. Before data collection, permission was taken from respective departments. An informed consent was obtained from all those participants who were willing to participate.

2.6. Data Collection

Data was collected in two phases. In the first phase, a self- designed questionnaire was asked to fill by the students containing demographics and other symptomology of Upper Cross Syndrome which included pain in neck region, duration of study hours, frequently used electronic gadget for study, total study hours, stiffness around neck and chest, area and type of pain while studying, presence of headache, need to support the head or neck while studying. In the second phase, restricted neck range of motion was assessed using a goniometer, forward head posture was checked using the wall and ruler method (this method involves the patient standing with his or her back against the wall, then the practitioner uses a ruler to measure how far the back of the head is from the wall. If the head touches the wall while naturally standing up straight, there is no forward head posture but if the back of the head does not touch the wall, forward head posture is present and then the distance between the back of the head and wall is measured via ruler) and posture analysis was done to check for rounded shoulders (deviation in relation to the anatomical landmarks) by a physiotherapist.

2.7. Data Analysis

The data was entered and analyzed through SPSS version 22. Percentages of different variables were computed by using descriptive analysis techniques. The bar charts and tables were categorized for each variable. Association was found out by using chi-square test in which the P-value of <0.05 depicted a significant correlation between the two variables while P-value >0.05 depicted an insignificant correlation.

3. Study Findings

Table 1 shows distribution of participants with respect to their ages. Total 47.54% subjects were in the age group of 18-21 years while 52.46% were in the age group of 22-25 years. Table 2 shows distribution of type of gadget frequently used. It reveals that 2.3% subjects used desktop computers, 83.9% used mobile phones and the rest 13.8% students were engaged in using laptops. Fig 1 shows the distribution of activities students do more than 3 hours/day. It reveals that 12.79% students watched TV, 67.87% used mobile phones, 11.15% used to engage with computer/laptop, 7.87% loved to read books and novels etc. while 0.33% subjects used to drive for more than 3 hours/day. Fig 2 shows the

distribution of daily study hours of students per day. It demonstrate that 33.44% students studied 1 hour daily, 47.54% studied for 2-3 hours, 16.07% studied for 4-6 hours while remaining 2.95% dedicated more than 6 hours of their daily routine for study. Fig 3 shows distribution of students experiencing tightness around neck. Approximately 72.13% felt tightness around the neck and 27.87% didn't.

Fig 4 shows distribution of students who felt pectoral muscle stiffness. A total of 12.79% students felt mild stiffness, 67.54% felt moderate stiffness while 19.67% felt severe stiffness in the pectoral muscles. Table 3 shows distribution of students experiencing pain in any area while using gadget for prolong time or studying in awkward body position. It represents that 80.3% students experienced pain while 19.7% didn't felt pain while using gadget for prolonged period of time. Table 4 shows distribution of type of Pain while studying. It shows that 6.9% subjects had continuous pain while gadget use, 73.4% had intermittent pain while 19.7% didn't have pain. Fig 5 shows distribution of area of pain. The figure reveals that 36.07% students reported pain in neck, 12.13% have had pain in upper back, 10.82% had pain in shoulders and 21.31% experienced pain in all the areas mentioned while 19.67% reported no pain at all. Fig 6 shows the distribution of students having round shoulders. Around 47.86% students had the condition while 52.13% had no such problem.

Table 5 shows the distribution of students feeling headache. The table shows that 83.3% students had headache after using laptop/mobile/watching TV/reading while 16.7% didn't. Fig 7 shows the distribution of students having restriction in ROM of neck. It shows that 32.13% students did feel limited movement in neck (any of flexion/extension/side bending/rotation) while 67.86% didn't have such complaint. Fig 8 shows the distribution of students who felt the need to support their head/upper back while using gadget/studying. The bar chart shows that approximately 76.39% students felt the need to support their head and upper back while using gadget or studying. On the other hand, 23.60% students didn't feel the need to support their head and upper back.

Fig 9 shows the distribution of students taking treatment for neck/shoulder/upper back pain. It shows that 20% students took pain killers, 7.21% took physiotherapy while 72.79% were among those who had pain but took no measures at all. Fig 10 shows the distribution of

students diagnosed with forward head posture. It was revealed that 15.41% students had correct head alignment in relation to body while 84.59% students had forward head posture. Pearson Chi-Square test.1 applied between hours of study and area of pain revealed significant correlation with each other with P-value= 0.000. Another association was found between mobile phone usage and area of pain employing Pearson Chi-Square test no.2. It also fetched a significant correlation with P-value=0.014.

Table 1: Age of subjects.

Age of the subject	Frequency	Percent
18-21 years	145	47.5
22-25 years	160	52.5
Total	305	100.0

Table 2: Type of gadget frequently used.

Type of gadget	Frequency	Percent
desktop computer	7	2.3
mobile	256	83.9
laptop	42	13.8
Total	305	100.0

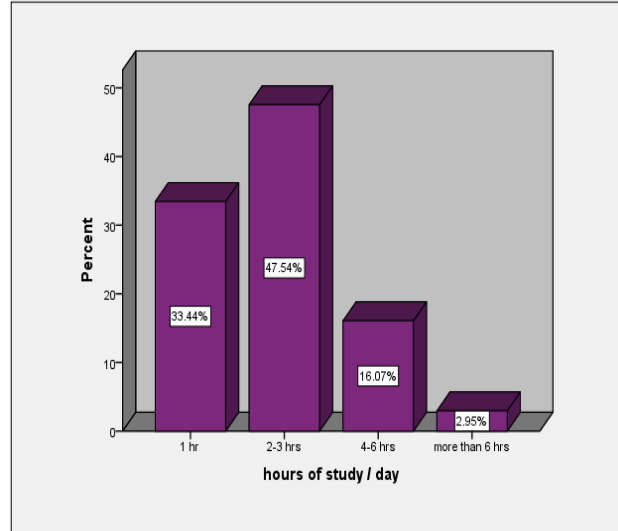


Fig 2: Hours of study/ day.

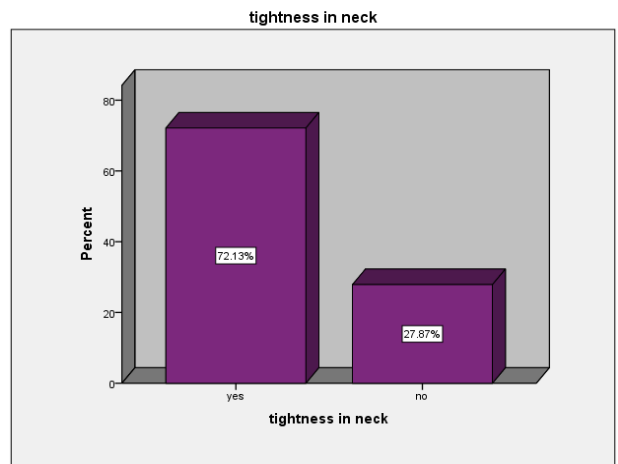


Fig 3: Tightness in neck.

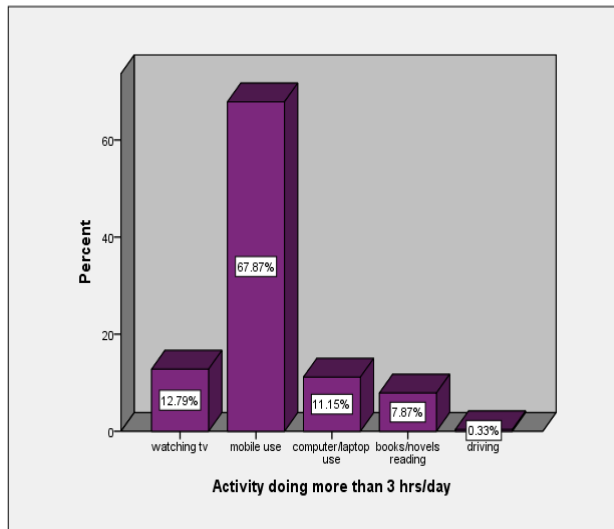


Fig 1: Activity doing more than 3 hours/day

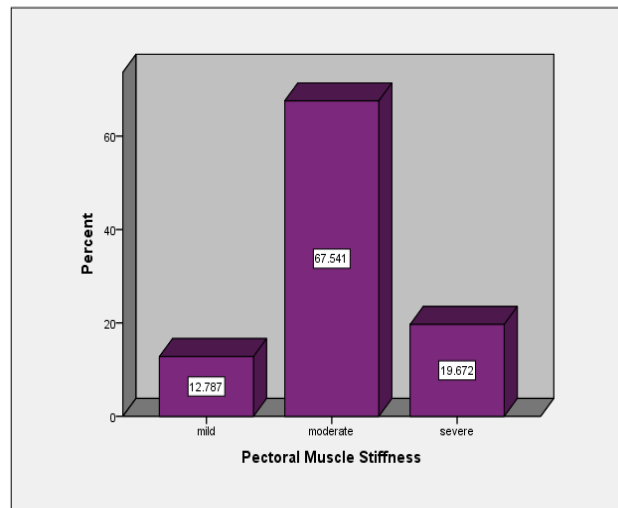


Fig 4: Pectoral muscle stiffness (subjective)

Table 3: Experience pain while studying/using gadget in awkward posture.

Experience Pain while studying/using gadget in awkward posture	Frequency	Percent
yes	245	80.3
no	60	19.7
Total	305	100.0

Table 4: Type of pain while studying/using gadget.

Type of Pain	Frequency	Percent
Continuous	21	6.9
Intermittent	224	73.4
No pain	60	19.7
Total	305	100.0

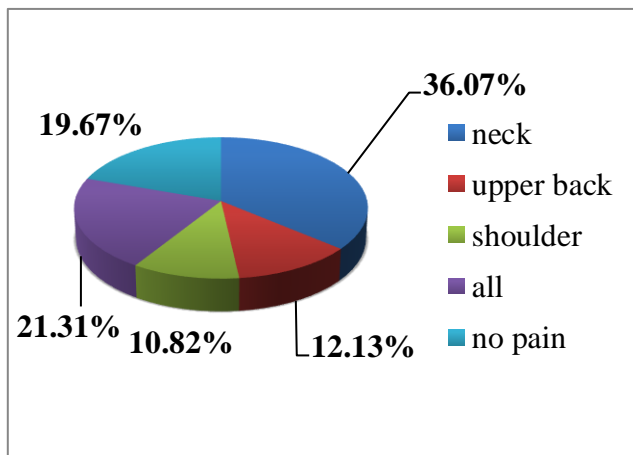


Fig 5 : Area of pain felt while studying or using gadget.

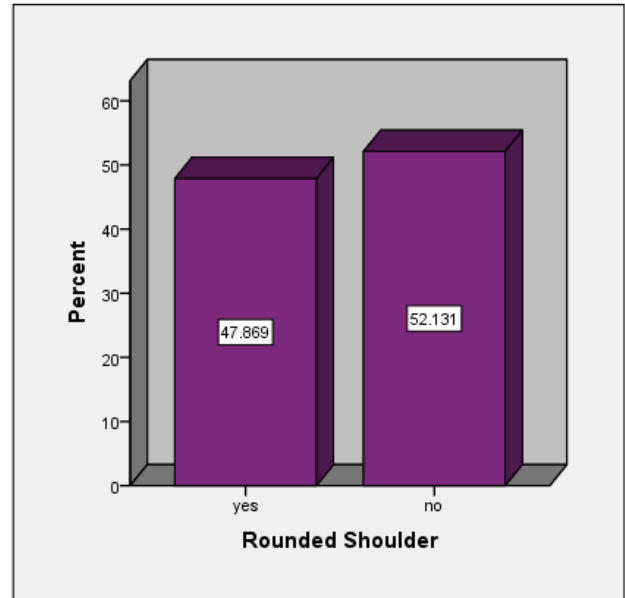


Fig 6: Students having rounded shoulders.

Table 5: Headache after using gadget, watching TV or reading/studying.

Headache after using laptop / mobile / watching TV / reading	Frequency	Percent
yes	254	83.3
no	51	16.7
Total	305	100.0

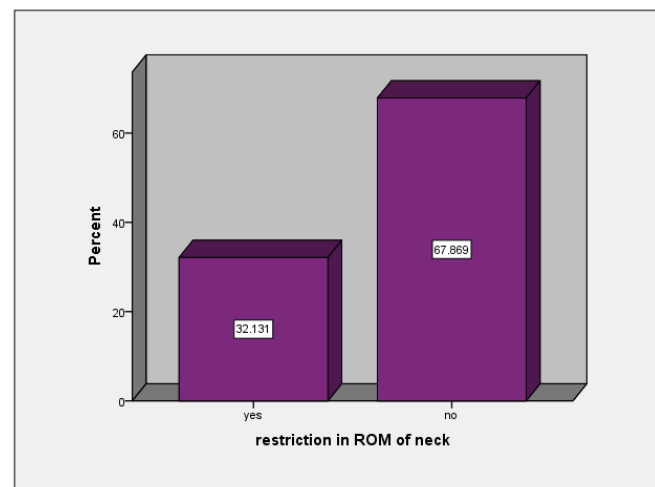


Fig 7: Restriction in ROM of neck.

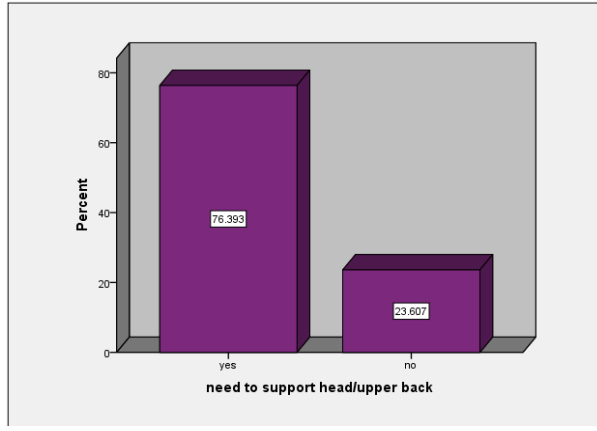


Fig 8: Need to support head or upper back.

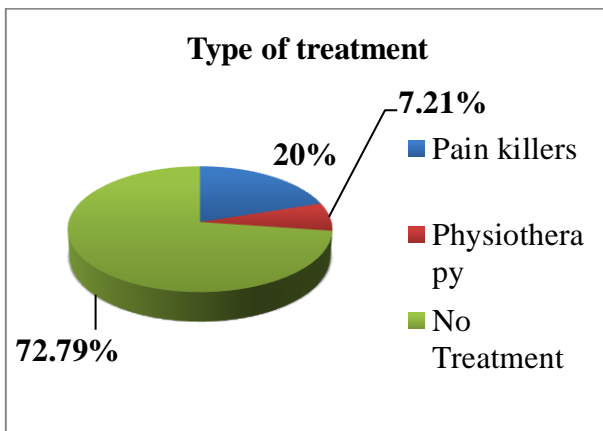


Fig 9: Treatment for neck/shoulder/upper back pain.

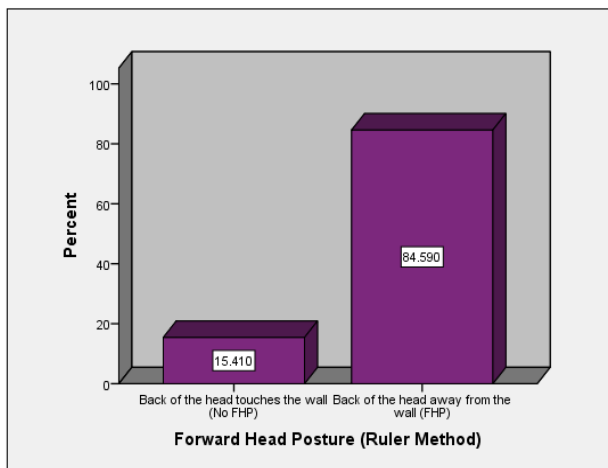


Fig 10: Students having Forward Head Posture (FHP)

Table 6: Pearson Chi-Square Test 1- HOURS OF STUDY* AREA OF PAIN.

Hours of study* Area of Pain	Value
Pearson Chi-Square	44.639 ^a 12 .000

Table 7: Pearson Chi-Square Test 2- ACTIVITY DOING MORE THAN 3 HOURS PER DAY (MOBILE PHONE USAGE)* AREA OF PAIN

Activity doing more than 3 hrs/day (mobile phone usage)* Area of pain	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.818 ^a	16	.014

4. Discussion

This present study was intended to explore the main signs of upper cross syndrome which are neck stiffness and pain, forward head posture and rounded shoulders. Study findings revealed that 36.07% students had neck pain while using any electronic device or when studying. Also, it was found that 76.39% students felt the need to support their head and upper back while using gadget or studying. On the other hand, 23.60% students didn't feel as such. Mubeen I, et.al. (2016) found somewhat similar results in their study which was conducted among the medical students of university of Lahore to find the prevalence of upper cross syndrome. Their findings revealed that 48.7% population of the students had neck pain and 52.1% of students found it difficult to stabilize their neck whenever they were to sit for prolong time, whereas 47.9% population didn't find difficulty stabilizing their neck (5).

This study also found that in the 36.07% subjects who had neck pain, 32.13% students were those who felt limited movement in neck range of motion (flexion/extension/side bending/rotation). Another study conducted previously by Shahid S., et.al. (2015) to find the prevalence of upper crossed syndrome among DPT students of university of Lahore reported that there were 23.4% respondents who were having neck pain during flexion movement (6). This shows that the percentage obtained in our study for the respective parameters was more than that reported by the previous study. This

increase may be due to increased trend of gadget usage in now a days for different purposes as compared to the habits of students in 2015.

Furthermore in current study, when we compared the association between variable No. 1: (hours of study) with variable No. 3 (pain in neck, shoulder and upper back) and variable No. 2 (frequent mobile phone usage) again with variable No. 3 (pain in neck, shoulder and upper back), a significant correlation was observed ($P=0.000$ and $P=0.141$ respectively). A study by Thomée S., *et al.* (2011) also showed that the total time spent using a smart phone was significantly associated with any pain in the neck and shoulder (7). Thus, our study demonstrates a good consistency with the referred study.

5. Conclusion and Recommendations

Based on study findings, it has been concluded that a significant number of medical students in Women Medical College, Abbottabad are suffering with Upper cross syndrome either due to excessive smart phone usage or poor study posture. Moreover, it has also been observed that a very less number of medical students opted for its proper physiotherapy treatment which is a matter of concern. Therefore, in order to prevent and treat this increasingly growing condition, it is important to promote proper body mechanics and good postural habits which can be achieved through posture awareness campaigns, seminars and posture education. Frequent posture analysis should be done to correct any faulty body derangement at an early stage. Students should be encouraged to exercise and seek physiotherapy treatment if the sign of this condition is observed in order to stay healthy.

Conflict of interest The authors report no conflict of interest.

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