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RESEARCH ARTICLE

PREVALENCE AND AWARENESS OF CUMULATIVE TRAUMA DISORDERS IN ARCHITECTURE STUDENTS

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ABSTRACT

Cumulative trauma disorders are a group of disorders affecting the upper limb joints, back and neck. These disorders mainly take place due to activities done repeatedly and forcefully for a longer duration of time, with increasing amount of stress that gets built up in the tissues and other muscular structures. Students studying architecture are exposed to conditions which involve doing these activities. This study was done focussing on finding out the prevalence and awareness of cumulative trauma disorders in architecture students. A sample size of 200 was taken. Bachelor and master students of architecture were selected. Students with previous upper limb injuries or pathology, were not included in the study. A self-structured questionnaire was distributed amongst the population and results were calculated using descriptive analysis. There were up to 80.50% of prevalence of these disorders amongst the architecture students, and 59.62% of the population were aware of them.

Practitioner summary: Cumulative trauma disorders are potentially preventable and treatable. This study grossly emphasized on the prevalence of these disorders and awareness in architecture students so as to undertake definitive preventive strategies. There was a high prevalence as well as moderate amount of awareness of cumulative trauma disorders amongst these students.

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INTRODUCTION

Architecture students along their course duration are trained for planning, designing, drawing, preparing models for construction of buildings. They are expected to draw and use their drawing boards and maintain a static posture for a long duration of time (Datar, 2009). Bending from the back, sustaining the posture periodically, drawing, minute detailed work, pressing of the arm or the forearm against the drawing board, all of this leads to improper posture over time, in them and other upper extremity musculoskeletal disorders due to repetitive movements of forearm, wrists, fingers during drawing. CTD's i.e cumulative trauma disorders is an umbrella term for disorders affecting the upper extremity primarily along with back and neck due to repetitive activity, forceful exertions, mechanical compression over time which causes the underlying tissues to get strained. They include conditions like carpal tunnel syndrome, tendinitis, tenosynovitis, epicondylitis, low back disorders and cervical radiculopathy which develop gradually over periods of weeks, months or years (Rempel, 1992). These disorders are most commonly seen in office workers.

The architecture students, due to their work and study demands are very easily predisposed to these conditions (Datar, 2009). Incorrect seating and postural habits, unhealthy workplace environment, which does not cater to every student's stature and needs, compels them to compromise with their comfort. Proper ergonomics related to posture, modifications according to their job and study demands, exercises to train their muscles and strengthen them can go on a long way to eradicate or subside these musculoskeletal problems.

MATERIALS AND METHODS

To determine the prevalence and awareness of cumulative trauma disorders in architecture students-A cross-sectional observational study was performed by selection of a sample size of 200 architecture students purposively. Bachelor and master students of architecture were included in the study. Students having undergone any injuries to the upper limb or back, having any history of an underlying or an ongoing pathology were excluded from the study. After the approval from the ethical committee and after taking an informed written consent from the subjects, the title and need of the study and the procedure of data collection was explained. A self structured, validated questionnaire was distributed amongst the population. They were asked to fill up the

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required. Confidentiality was assured to all the subjects, to get their cooperation. After the data collection, data was analyzed using descriptive analysis and the results were concluded.

RESULTS

The results were analysed using descriptive analysis. 80% of the population experience pain while working, while the rest of the 20% of population do not experience any pain while working. Figure 1 shows Prevalence of cumulative trauma disorders in architecture students is present.

Prevalence of Pain

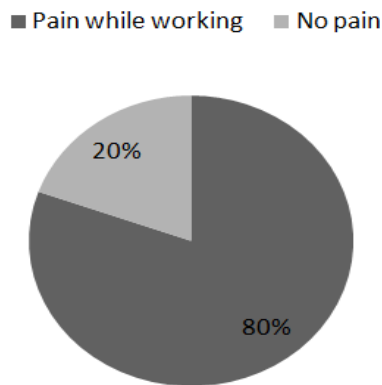


Figure 1. Prevalence of Pain

The region maximally affected is the back, which is 71.42%, followed by the neck, 60.24%, shoulders, 55.27%, and elbow, wrist and the fingers shown minimal affection. 5.59% of the population experienced pain between 1-3 on the visual analogue scale, 74.53% of the maximum population experienced pain, between 4-7 and lastly 19.87% experienced pain ranging from 8-10.

Table 1. of working hours

No. of working hours	No. of subjects	Percentage
2-4 hours	10	6.21%
4-6 hours	49	30.43%
6-8 hours	59	36.64%
More than 8 hours	43	26.70%

Table 1 shows working hours of these students were also influential on their condition. Maximum of the population is working for 6-8 hours, 30.43% of them from 4-6 hours whereas 26.70% of them for more than 8 hours and the rest of them from 2-4 hours.

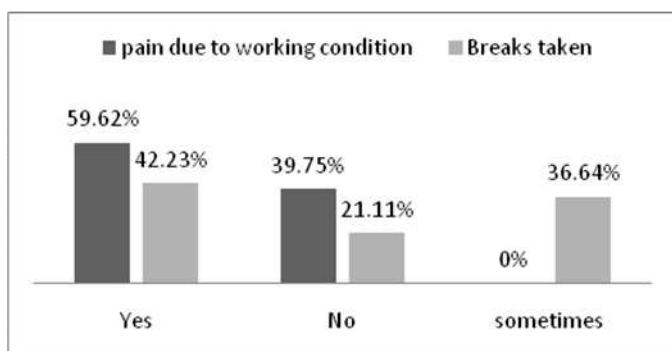


Figure 2. Awareness of pain due to working condition & Breaks taken

59.62% of population are aware of pain due to working conditions, while 39.75% of them are not aware of it. 42.23% of population take breaks in between their work, while 21.11% do not take any breaks in the middle of their work. Figure 2 shows majority of population were aware about pain due to working as well as breaks taken.

Table 2. Posture while working

Posture while working	No. of subjects	Percentage
Bending from lower back	98	60.86%
Bending from neck	30	18.63%
Low back straight	10	6.21%
Upper back/neck straight	23	14.28%

60.86% of the maximum population bend from their lower back, 18.63% from their neck, 14.28% work keeping their upper back/neck straight, 6.21% work keeping their low back straight, along with other factors like the posture attained while working (Table no. 2). 54.03% have an adjustable draft table whereas 45.96% have a non-adjustable draft table. 42.23% of the population keep the draft table inclined, 48.44% of them keep it horizontal, while the remaining of the 9% keep it vertical.

Table 3. Awareness about pain

How are you aware about the pain?	No. of subjects	Percentage
Doctors/Physiotherapists	57	35.40%
Friends/Family	104	64.59%

64.59% of the subjects are aware of it because of their friends/family, while the others by their doctors /physiotherapists. Awareness by doctors/physiotherapists or friends/family mentioned in Table no 3.

Table 4. Pain Relief

Pain relief	No. of subjects	Percentage
Rest	97	60.24%
Hot water fermentation	26	16.14%
Physiotherapy	34	21.11%
Ice packs	4	2.48%

Maximum of 60.24% of the population are relieved by rest, 21.11% by physiotherapy, 16.14% by hot water fermentation and the remaining by ice packs. Table 4 shows majority of them have Pain relief by taking res.

DISCUSSION

This study indicates a higher incidence of cumulative trauma disorders amongst architecture students with higher affection of the back, followed by the neck, shoulders, wrist, fingers and elbow. This is due to their maximum working hours, with most of the population working for 6-8hrs. Bending from the lower back & neck constitute for the pain as well. Higher prevalence of these disorders is thought to be a result of several factors; accuracy of reporting, heightened awareness and the ever accelerating pace of work (Rempel, 1992). A study of creep and fatigue development in the low back in static flexion causes fatigue of back extensor muscles in constant flexion which stresses the lower back and causes pain (Shin, 2009). Poor work station ergonomics, exposure to computer related and organizational risk factors for a longer duration of time causes these disorders. This was concluded by a study done on

musculoskeletal disorders among university computer user students (Lorusso, 2009). Soft tissue micro-tears and trauma due to the cumulative forces acting on the musculature causes pain and inflammation. Prolonged static ergonomically incorrect posture can cause spasm and fatigue in the muscles. Dull aching and continuous pain can be its long term effects. Besides this, external environmental factors such as height of their working table, its placement, adjustability of that table contribute and give rise to these disorders. CTDS are preventable and treatable disorders. Rest forms the mainstay of the treatment for these disorders. It reverses the effect of fatigue and reduces pain. Icing or hot water fermentation on the affected part provides acute relief. Physiotherapeutic exercises, stretching, relaxation manoeuvres and other training strategies like work hardening and work conditioning can be undertaken (Rempel, 1992). Job place or study place modifications simultaneously can meet the required demands. The above interventions can go on a long way to curb the possibility of these disorders. Authors found moderate awareness of these upper limb disorders in this study. Due to increasing number of reported cases, easy detection and screening, undertaking ergonomic drives, awareness of the disorders amongst the population is seen to be increasing.

Conclusion

This study concludes prevalence of cumulative trauma disorders in 80% architecture students, and moderate amount of awareness of these disorders amongst them.

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