Intensity and level of disability of neck pain among undergraduate physical therapy students: A Cross Sectional Study

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ABSTRACT

Background: Neck pain is characterized by pain in the posterior-inferior part of the occiput and neck pain is become increasingly common in individuals.

Objective: To find out the intensity and level of disability of neck pain among undergraduate physical therapy students of Agile Institute of Rehabilitation Sciences, because medical students are at high-risk group of developing neck pain.

Methods: It was a cross-sectional study. We included 145 students with neck pain, from 1st year to final year, both male and female in age 18-30 years. The data was collected by using convenience sampling technique. The pain was measured using Numeric Pain Rating Scale (NPRS), and Neck Disability Index (NDI) to classify the severity of disability of their neck. The data was entered in SPSS version 25 for analysis. The frequency tables and graphs were used to represent the results.

Results: In this study 145 participants were included, out of all 108(74.5%) were females and 37(25.5%) were males, with mean age 24.75 ± 5.25 years. This study shows that 74(51.0%) participants had mild pain, 61(42.1%) had moderate pain and 10(6.9%) participants had worse pain. The categories of NDI were mild among 85.5%, 8.3 % were in moderate and 6.2% were in sever disability category.

Conclusion: Undergraduate physical therapy students have mild pain and disability according to NPRS and NDI respectively.

Keywords: Neck pain, Neck Disability Index, Numeric Pain Rating scale, Undergraduate, Physical Therapy students

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Introduction:

Neck pain is pain that occurs below the head and above the shoulder area (bounded anteriorly by the lower edge of the mandible, posteriorly by nuchal lines, and inferiorly by imaginary lines flowing through the first thoracic vertebrae).(1) Neck discomfort affects the posterior-inferior section of the occiput, the dorsal region of the neck, the shoulders, and the upper brachium. It's linked to a limitation of neck movement as well as trigger points in the cervical muscles. It is associated with the restriction of neck movement and also with trigger point formation in cervical muscles.(2)

Neck pain has become increasingly common in families and individuals (ranges between 0.4% to 86.8%).(3) In high-income nations and in metropolitan areas, prevalence is high among women, with 16.7 to 75.1% of the population as a whole having the condition.(4) The connecting part between the head and the trunk is the neck which provides a degree of freedom for neck movement.(5) In anatomical terminology, neck is also known as "column "and "cervical Region".(6) The above regions consist of the following components such as muscles, cervical vertebrae, trachea, esophagus, thyroid, parathyroid gland, neural structures, and vascular structure.(7) Atlas and axis of the cervical spine show atypical behavior due to their configuration. Flexion, extension, side flexion, and turning motions are the next spinal movements that occur at the cervical spine. The C1 and C2 vertebrae are where the turning movement primarily occurs. Long-term cervical spine bending compromises the following structures: the shoulder, scapula, and thoracic spine, which results in lower cervical spine extension deformity and upper segment flexion deformity. The overuse of the muscles causes muscular imbalances.(8)

When the posture of the shoulder becomes rounded then it changes the rotational axis of the shoulder joint and this changes the mechanical stability of the brachium from the muscles of the neck, shoulder, and pectoral region. The over-worked upper quadrant muscles generate tear in the deltoid muscle which causes shoulder impaction, inflammation of tendons, bursa, muscle weakness, and stretch weakness of upper quadrant muscles.(9) Students often adopt this posture when they are reading, watching TV, biking, driving, and using a laptop, computer, or smartphone.(10) Sustained sitting posture can lead to a change in the angle of the head and can over-stress the posterior muscles with the change of angle of the head which can change whole biomechanics of the neck, chest, and shoulder. The normal angle of the head over the neck increases which is directly proportional to the curvature of the cervical spine. The normal angle of head available in literature when load 10-12 lb. is $0°$, 27 lb. $15°$, 40 lb. $30°$, 49 lb. $45°$, and 60 lb. causing $60°$ tilting of the head.(11) One of the studies showed that workers highly exposed to both physical and psychosocial workplace risk factors were more likely to report symptoms of upper extremity musculoskeletal disorders than workers highly exposed to one or the other workplace.(12)

Among the musculoskeletal disorders, the neck pain in elderly population is 38%, in young range from 6% to 22 % while lifetime prevalence is 14.2 to 71 %. The problems related to the musculoskeletal region related to the work consist of health problems in numerous developed countries because they report a high number of lost days and compensatory work of workers and cost of disability.(13) Literature shows that intensity of neck pain and level of disability was high among undergraduate students because students are at more risk due to prolonged sitting posture(14), resulting in greater angle of neck and trunk. There is a need to develop preventive strategies and decrease the burden of neck pain among medical students. As there is no local study available on neck pain among undergraduate physical therapy students upto our knowledge hence the aim of study was to find out the intensity and level of disability of neck pain among undergraduate physical therapy students. The results can be used to decrease the burden of disease among students and also to plan the cost effective treatment strategies.

Methods:

It was a cross-sectional study. The data was collected from the Agile Institute of Rehabilitation Sciences Bahawalpur. Undergraduate students from 1st year to final year both male and female of age 18-30 years were included. It was completed within 4 months (from 26 October 26 February 2021) after the approval from Institutional Review Board (IRB No. AIRS/IRC/S-05). The sample size was 145, calculated with a margin of error with respect to numerical listed below, the sample size "n" and error "E" chance is calculated as, N is population size (245 was our population size),and $Z(c/100)$ is the critical value for the confidence level c. N= 145 (sample size).(15)

X   =   Z(c/100)2r(100-r)

N   =   N x/((N-1)E2 + x)

E   =   Sqrt[(N - n)x/n(N-1)]

The data was collected by using a convenient sampling technique on undergraduate students with neck pain. Mechanical factors (such as poor sitting posture, sitting on stool and chair without arm rest and backrest and poor ergonomics of classroom) were included only. The exclusion criteria of the current study included students with a history of Trauma/ surgery of neck region within 1-month, cervical radiculopathy, whiplash injury, neck fracture, systemic diseases include osteomyelitis, osteoporosis, osteoarthritis, degenerative disk disease, and other non-mechanical factors. The demographic data was gathered from the students such as previous history of neck surgery, systemic diseases such as DJDs and trauma from last 3 months. Outcome measuring tools of our study were the Numeric Pain Rating Scale (NPRS) and the Neck Disability Index (NDI). Test and retest repeatability were $r = 0.96$ and 0.95 respectively on NPRS. Reliability: for Chronic pain, $r=0.94-0.99$ and for acute pain was $r=0.81-0.83$.(16) Participants score their pain on the numeric pain rating scale from 0 to 10, where 0 is no pain and 10 is the worst pain. Their neck disability index was then utilized to categorize the degree of their neck disability. Ten sections, five in each, make up the NDI. Then their NDI was determined using the criteria of mild, moderate, and severe. Mild, moderate, and severe were defined as being between 17 and 33. Neck Disability Index is a 10-item graded questionnaire (NDI), created from Oswestry low back index. It has test-retest reliability, with good predictive value (Pearson's $r = 0.89$, p. 05).(17)

For analysis, the data was entered into SPSS version 25. The data were represented using frequency charts, tables, and graphs for the descriptive representation of the mean age, BMI, and pain. The rights of research

participants were protected, and the norms and regulations were observed when performing the study. Only scientific aims were pursued using the collected data. Everyone who took part provided written, informed consent. Data gathering and all information were kept private.

Results:

According to the findings, the current study included 37 males and 108 females between the ages of 18 and 30 years. Almost 141 students belonged to middle class and 4 belonged to lower class. The frequencies of BMI were: Underweight (12 Males, 30 Females), normal (16 Males, 60 Females), overweight (7 Males, 12 Females), and obese (7 Males, 12 Females). Around 68 out of 145 people had a history of illness. (Table No: 1)

Table No: 1 Demographic Details of Participants

Demographic Data	Categories	Frequency (N=145)	Percentage
Gender	Male	37	25.5
	Female	108	74.5
Age Groups	17-20	53	36.5
	21-24	84	57.9
	25-28	8	5.6
Socioeconomic Status	Middle Class	141	97.2
	Lower Class	4	2.8
Body Mass Index (BMI)	Under Weight (16-18.5)	12M,* 30F*	28.96
	Normal (18.5-24.5)	16M, 60F	52.41
	Over Weight (25-30)	7M, 12F	13.10
	Obese (> 30)	2M, 6F	5.51
Previous History	Yes	68	46.9
	No	77	53.1

*M = Males, F= Females

According to NPRS findings, neck pain was more prevalent among female students as compared to male students. The sleeping pattern disturbance was higher in females 50.92%, as compared to males 37.83% as per self-structured questionnaire.

Table No: 2 Numeric Pain Rating Scale

Numeric Pain Rating Scale	Frequency	Percentage
Mild	81	55.9
Moderate	57	39.3
Severe	7	4.8
Male	10	40
Female	65	60

The results of the current study showed that students with mild disability were 124(85.5%), with moderate disability were 12(8.3%), and with severe disability were 9(6.2 %). More females were having mild disability index as compared to males. (Table No: 3)

Table No: 3 Neck Disability Index And Gender

Neck Disability Index	Frequency	Male	Female
Mild	124	32	92
Moderate	12	1	11
Severe	9	4	5
Total	145	37	108

Discussion:

The result of present study concludes that 74(51.0%) participants were suffering from mild pain, 61(42.1%) were suffering from moderate pain and 10(6.9%) participants were suffering from worst pain on NPRS. And according to NDI findings 124(85.5%) participants were suffering from mild disability, 12(8.3%) participants were suffering from moderate pain and 9(6.2%) were suffering from severe disability due to neck pain. These findings are consistent with a studies conducted in multiple regions reporting higher prevalence of neck pain among Undergraduates students, i.e. 51.8% in Lahore, (15) 40.5% in China (18), 44.8% in Pakistan (19), 58.3% in India (20), 49.2% in Ethiopia (21) and 46% in the Thailand.(14)

This current study showed that neck pain is more prevalent in females as compared to males, similar to a study conducted in undergraduate students in University of Sargodha which stated that female students are more likely than male students to have neck pain, with 67% prevalence in females and 33% in men, confirming earlier evidence that gender is an important risk factor for neck pain.(22) It was also similar to a study conducted in Lahore where, mild to severe pain was found but it was due to electronic media usages such as cell phone, desktop computer, tablet, mechanical alignment of body, and other associated factors.(15) In contrast to our study, the study was conducted on students with age of 18-25 years in the department of medicine and health sciences in UTAR (Universiti Tanku Abdul Rehman Kampar Malaysia) in whom neck pain mostly occurred in 2nd-year students (35.9%).(23) In our study, pain was most commonly reported in the 2nd professional year students, compared to the survey of undergraduate medical students at UOS (the University of Sargodha), in whom neck pain was most common in 5th-year students (39.5%) because of their study hours. The possible reasons for these differences are mental and physical health, study hours, part time job and ergonomical factors related to their respective institute. According to their study, the students have more acute pain (64.5%) than chronic pain (35.5%).(24)

The disability rate of our study according to NDI is 85.5% (mild). In contrast with the study conducted by the physical therapy students of Peshawar in whom the frequency of neck pain was 84%. The major age group affected by neck pain was 20-30 years and 28% of students reported having neck pain belongs to final year. According to NDI, the results of neck pain on routine work such as sleeping pattern changes were reported in 23.3%, student's hindrances in using laptop reported in 16.5%, problem in computer work 14.5% and disturbance in driving was 17%. The disability rate according to NDI was 65.5% (mild).(25) In our study more females were having mild disability index as compared to males. The sleeping pattern disturbance was also higher in females than in males in contrast with the study of students of Riyadh. Persons having pain in the neck region had a greater disability rate than those having no pain. The cell phone usage was not significantly related to neck pain and disability rate but it significantly correlated with body alignment and head, neck, and body posture.(23, 26)

Some limitations of our study was that it was conducted in single setting only and didn't focus on associated factors including sleeping and study hours. It is recommended to conduct more advanced studies on this topic in Bahawalpur by using large sample size and a multi-centered approach by the involvement of students from across the district to check the intensity and level of disability of neck pain among students. There should be a proper assessment of neck pain and its prevention strategies among the students.

Conclusion:

According to the findings, undergraduate physical therapy students have mild pain and mild disability according to NPRS and NDI respectively.

Disclaimer: This study is a part of thesis project for the completion of graduation in doctor of physical therapy.

Conflict of Interest: None

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