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To Find out the Prevalence of Neck Pain Among Students of Computer Science Department

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ABSTRACT

A thorough analysis of the research on the association amongst the commonness of musculoskeletal illnesses and keyboard usage revealed that among computer users, the incidence of musculoskeletal disorders associated with keyboard use is comparatively high. Students make extensive use of the computers. Professionals reported using computers for less hours per day than students, according to a poll. Furthermore, college students file more complaints about computer use than do professionals. The training's goalmouth was to determine how common neck pain was among computer science department students. All students gave written informed consent after being informed about the study. A survey named the "Neck Disability Index" was applied to gauge how uncomfortable the students were. Students received information about the questionnaire's statement and were encouraged to express any questions they had about any questions that were confusing. Participants were asked to read their answers to each question on the questionnaire. Participants guaranteed that the evidence they submitted would be reserved isolated and used solely for study. Individuals who expressed a willingness to participate in the study were included, while those who did not were eliminated. To collect data, the Neck Disability Index examine was used. The neck infirmity index was used in this investigation. Near remained 209 contributors in the existing study, of which 49% were females and 51% were male. The computer science department's student body had a higher frequency of neck pain. Additionally, it was discovered that using computer during working hours was linked to neck pain.

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INTRODUCTION

A thorough analysis of the research on the relationship between the prevalence of musculoskeletal illnesses and keyboard usage revealed that among computer users, the incidence of musculoskeletal disorders associated with keyboard use is comparatively high. Students make extensive use of the computers. Professionals reported using computers for less hours per day than students, according to a poll. Furthermore, college students file more complaints about computer use than do professionals. The study's goal was to determine how common neck pain was among computer science department students. All students gave written informed consent after being informed about the study. A questionnaire called the "Neck Disability Index" was utilized to gauge how uncomfortable the students were. Students received information about the questionnaire's statement and were encouraged to express any questions they had about any questions thatwere confusing. Participants were asked to read their answers to each question on the questionnaire. Participants guaranteed that the information they submitted would be kept private and used solely for study. Individuals who expressed a willingness to participate in the study were included, while those who did not were eliminated. To collect data, the Neck Disability Index examine was used. The neck disability index wasused in this investigation. There were 209 participants in the current study, of which 49% were females and 51% were male. The computer science department's student body had a higher frequency of neck pain. Additionally, it was discovered that using a computer during working hours was linked to neck pain.

According to the study, students who use computers should take brief breaks and get instruction and training in an atmosphere that promotes ergonomics. The computer has been considered a useful device to improve the quality of the health care system as well as helpful in studying the efficiency of health workers in the world. Even though information, communication, and technology are being used to improve healthcare systems there may be associated health hazards with the use of these devices [(1)]. Musculoskeletal disorders are the most common type of work-related health problems in the world. Computer- related musculoskeletal disorders continue to be a substantial public health problem. These disorders affect millions of computer users in the world [(2)]. The term musculoskeletal disorders enclose a group of inflammatory and degenerative conditions that affectsthe muscles, tendons, ligaments, joints, peripheral nerves and supporting blood vessels with consequent aches, pain and discomfort [(3)]. An extensive review of the literature on the association between keyboard usage and the prevalence of musculoskeletal disorders showed that the prevalence of keyboard-related musculoskeletal disorder among computer users is relatively high [(4)] Students use computers and smartphones on a daily basis these days. According to a survey, professionals reported working less hours each day on computers than students did. Additionally, complaints about computer use are more common among college students than among professionals [(5)]. The common musculoskeletal symptoms reported were pain (55%) and stiffness (14.8%) and the common sites affected with musculoskeletal problems were neck (44%), low back (30.5%), wrist/hand (19%), and shoulder (12.5%) [(6)].

Neck pain is a common health problem in the general population and especially among computer workers. Most people experience some degree of neck pain in their lifetime [(7)]. Symptoms of neck pain can include general aches and pains that can be postural fatigue in the neck, shoulders, and arms, or persistent pain or discomfort in soft tissues surrounding the neck and shoulders. An ideally aligned neck has a slight lordotic curvature that looks. Prolonged computer uses and sitting with rounded shoulders and faulty neck posture

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disturb the normal lordotic curve of the neck leading to muscular imbalance and consequently neck pain [8].

The long-term, lower-intensity stresses and strains and improper postures are believed to be the most important causative factors for neck pain [9]. Duration of computer use, frequency of breaks, method of keyboard operation, and position of computer monitors, type, and use of input devices are also associated with neck pain at work. Reaching for the mouse, too low a monitor, and leaning forward to operate the computer are some of the faults in workstations that can lead to the development of neck pain [10].

OBJECTIVES

Primary objective:

- To find out the prevalence of neck pain among students of computer science department

Secondary objective:

- To find out the rate of neck pain between boys and girls
- To find out the relationship between working hours and NDI

REVIEW ARTICLES

1. Dr. S A Shah [6] did study on prevalence of neck pain in computer operators in year 2015 and they concluded that among office employees working with video display units, prevalence of self-reported non-specific neck pain was found to be 47%. It was also found that neck pain was associated with work related and individual variables.
2. Aysha siddiqua kalim Khan et al [11] studied on neck pain in computer users in year 2016 and the results of this study shows that the prevalence of neck pain in computer users was 28%. 40% computer users have associated complaint like upper limb pain and paresthesia which are related to neck posture. The prevalence is more in females (60%) and concluded that neck pain has direct relationship with duration of computer job in years, hours of daily work, age of the person, more the age, duration of computer job, daily hours of work more will be the chance of developing neck pain.
3. Faiza Sabeen et al [8] did study on prevalence of neck pain in computer users in year 2013 and results of this study shows that out of 50 persons 72% of computer users had neck pain strong association was found between neck pain and prolonged computer users. Those who took break during their work had less neck pain. No significant association was found between type of chair in use and neck pain. Neck pain and type of system in use also had no significant association. And concluded that duration of computer use and frequency of breaks are associated with neck pain at work. Severe neck pain was found in people who use computer for more than 5 hours a day.
4. Dr. Mohammed Younus Mustafa [12] studied on work related neck pain and its associated factors among registered female nurses who are computer users and the result of this study shows that socio-demographic, lifestyle, ergonomic factors and some of psychological variables were associated with neck pain and concluded that these association patterns suggest. Also, opportunities for intervention strategies in order to stimulate an ergonomic work place setting to improve physical exercise awareness and to increase a positive psychological work environment.
5. Ankita Bansal et al [13] studied on a cross sectional study to determine the prevalence of computer related health problems among students of information technology in various college of Surat city. And the results show that the study revealed the prevalence of the symptoms like watering in eyes, eye strain, back pain, shoulder pain, neck pain and may other problems which were common among students and become more persistent with the increase in hours of work. The study also explained gender variations and concluded that the computer students must be aware about health-related hazards and should be educated and trained for ergonomically conductive environment.

6. R Adedoyin et al [1] studied on musculoskeletal pain associated with the use of computer systems in year 2003 and result of this study shows low back pain and neck pain were found to be in the highest pain complaint with 74% and 73% respectively and 67% of the responders complained of wrist pain followed by finger pain (65%), shoulder pain (63%) and general body pain (61%).The knee and foot pains were least complaints reported with 26% and 25% respectively and concluded that the most complained problems are low back pain, neck pain and wrist pain and the pains are more severe in people with more than four years working experience on the computer system. This study can help in preventing occupational injury associated with use of computer with emphasis on good posture, work station design and making of computer hardware.
7. Ayoub Ghanbary Sartang et al [14] did study on evaluation of musculoskeletal disorders among computer users in year 2015 and results shows that the prevalence of musculoskeletal disorders among computer users in Isfahen universities is pretty high and ergonomics interventions such as computer workstation redesign, users educate about ergonomic principles computer with work, reduced working hours computers with work, cycle of rest work development, use holders paper to minimize the pressure on the neck and back and reduced muscular and visual fatigue, posture hands, wrists and forearms should be straight, in line and parallel to ground and elbows should be kept close to the body with the angle between 90 and 120 degree.
8. S Arun Vijay et al [6] studied on work related musculoskeletal health disorders among the IT professionals in year 2013 and results shows that the 59% of the IT professionals reported that they had experienced some form of work-related musculoskeletal disorders in the past 12 months and neck pain problems were the most frequently reported where 30% also low back pain, wrist and hand pain and shoulder pain were the next frequently reported symptoms where the annual prevalence was reported as 25%, 14%, and 13% respectively and they concluded that the work related musculoskeletal disorders are widely reported among IT professionals working in IT industries in India and an appropriate prevention strategy needs to be carried out in order to enable then work comfortably.
9. Varun Singh et al [12] did study on upper limb musculoskeletal disorder associated with computer usage in health care professionals in year 2015 and result of this study shows that prevalence of upper limb disorders was 45% in the study population about 35.69% of the total problems were related to neck 17.44% to shoulder 19.62% to arm and forearm 16.08% to wrist and 11.17% to hands and concluded that upper limb musculoskeletal disorders following heavy computer usage have a large prevalence among health care professionals and adequate steps for awareness and treatment of these disorder should be taken to provide better patient care and improve the health care system.
10. Mohsen Soroush MD et al [16] studied on the musculoskeletal complaints associated with computer use and its ergonomic risks for office workers in year 2015 and the results of this study shows that the most frequently reported musculoskeletal complaints were related to neck (58.53%) and lower back (58.53%) for men and knee (66.66%), lower back (64.61%) and neck (61.53%) for women. The prevalence of musculoskeletal complaints was significantly more among office workers who worked in a high-risk environment. The pains were considerable in the neck (74.54%) and lower back (80%) and concluded that prevalence of musculoskeletal complaints among office workers of AJA University of medical science is high. Ergonomic interventions such as computer work station redesign and office ergonomics training should be considered to prevent the

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related health problems, especially for high-risk work station.

11. M. J. H. McCarthy [17] did study on the reliability of the Vernon and Mior neck disability index, and its validity compared with the short form-36health survey questionnaire in 2007 and the results shows that the test-retest reliability of the NDI was high and comparable with the best values found with SF36.and concluded that NDI has good reliability and validity and that is compares well with the SF36. The NDI is shorter, quicker to answer and easier to score.

METHODOLOGY:

Ethical clearance was taken from the ethical committee before starting the procedure. The purpose of the study was explained and written informed consent was obtained from all the students. The "Neck Disability Index" was used as a questionnaire to measure the student's discomfort level. Information about the statement of the questionnaire was given to the students and they were encouraged to ask any question regarding the unclearness of the question of the questionnaire. Students were briefed about the purpose of the study. The questionnaire was given and asked to read their responses against each question. Assurance was given that the provided information will be kept confidential and will be used for research purposes only. Participants who were willing to be part of the study were taken into consideration and those who were unwilling were excluded. Neck Disability Index questionnaire was used for data collection.

Neck Disability Index (NDI) score: This questionnaire is designed to provide information as to how neck pain affects a person's ability to manage in everyday life. The questionnaire has 10 components and each component has a scoring from 0 to 5. Thus, total score achievable is 50. A greater score indicates greater disability.

Score (out of 50):

0 – 4 (0-8%) no disability

5-14 (10-28%) mild disability

15-24 (30-48%) moderate disability

25-34 (50-64%) severe disability

>35 (70-100%) complete disability

Test-retest reliability for NDI is found to be good; r = 0.89, Interclass correlation (ICC) = 0.68, 95%, CI = 0.54 – 0.90, Cronbach's alpha is 0.80; specificity and sensitivity are 59% and 52% respectively. Using a sample of 209 people, the study sought to determine the incidence of neck discomfort among computer science department students.

RESULTS:

A thorough analysis of the data was conducted using Microsoft Excel 2016. A thorough examination of the data was conducted, with a particular focus on its analysis using appropriate statistical tools. We examined descriptive statistics such as mean, standard deviation, frequency, and percentage.

Characteristics	Value
Age (mean ± SD)	20.92823 ± 1.032928

Table 1: Participant´s Demographic Data – shows mean value of Age

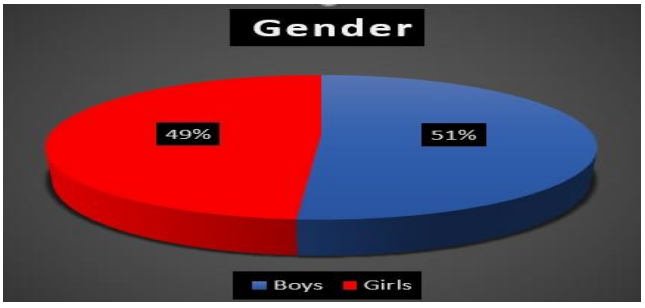

Figure 1: Percentage of Gender

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Neck Disability Index		Number of Participants		
Disability	Percentage	Total	Male	Female
No disability	0 – 8%	37	19	18
Mild disability	10 – 28%	103	57	46
Moderate disability	30 – 48%	57	25	32
Severe disability	50 – 64%	11	6	5
Complete disability	70 – 100%	1	0	1
Total		209	107	102

Table 2: Total Percentage of Participants with Neck Disability

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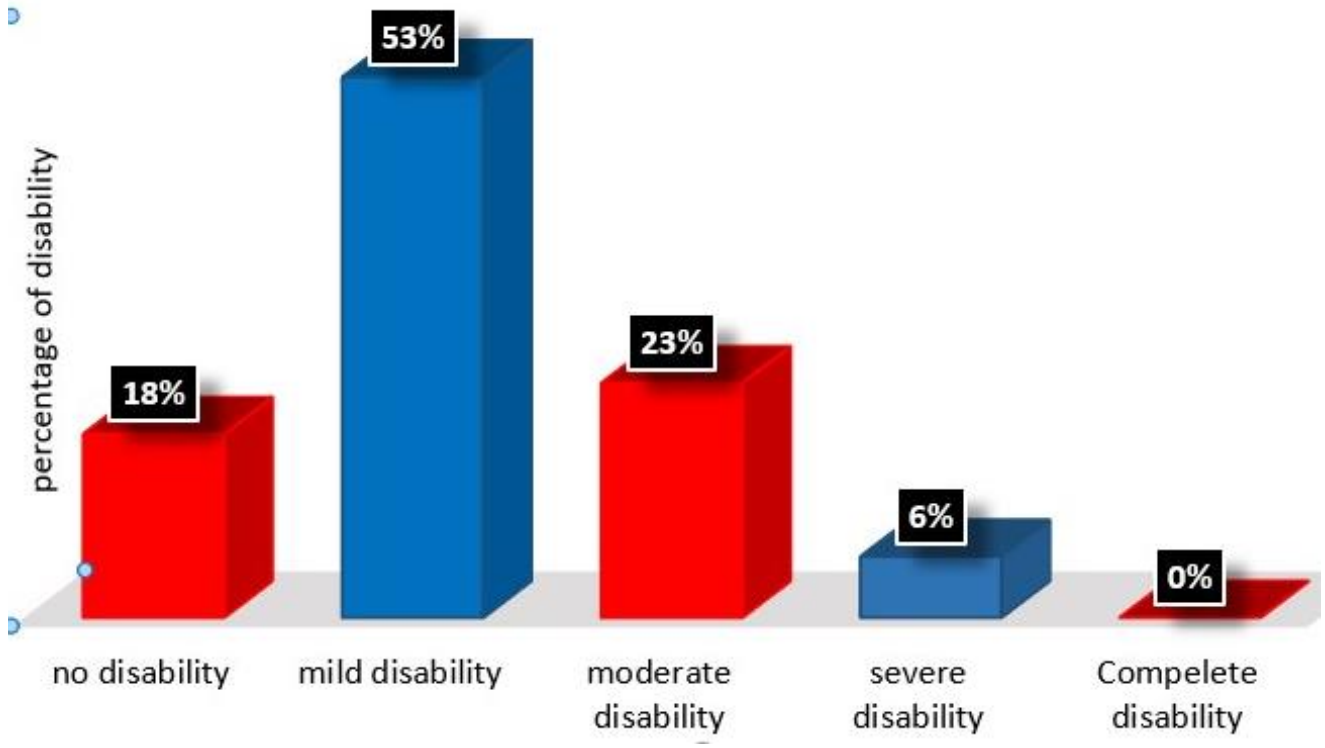

Figure 2: Percentage of Disability for Boys

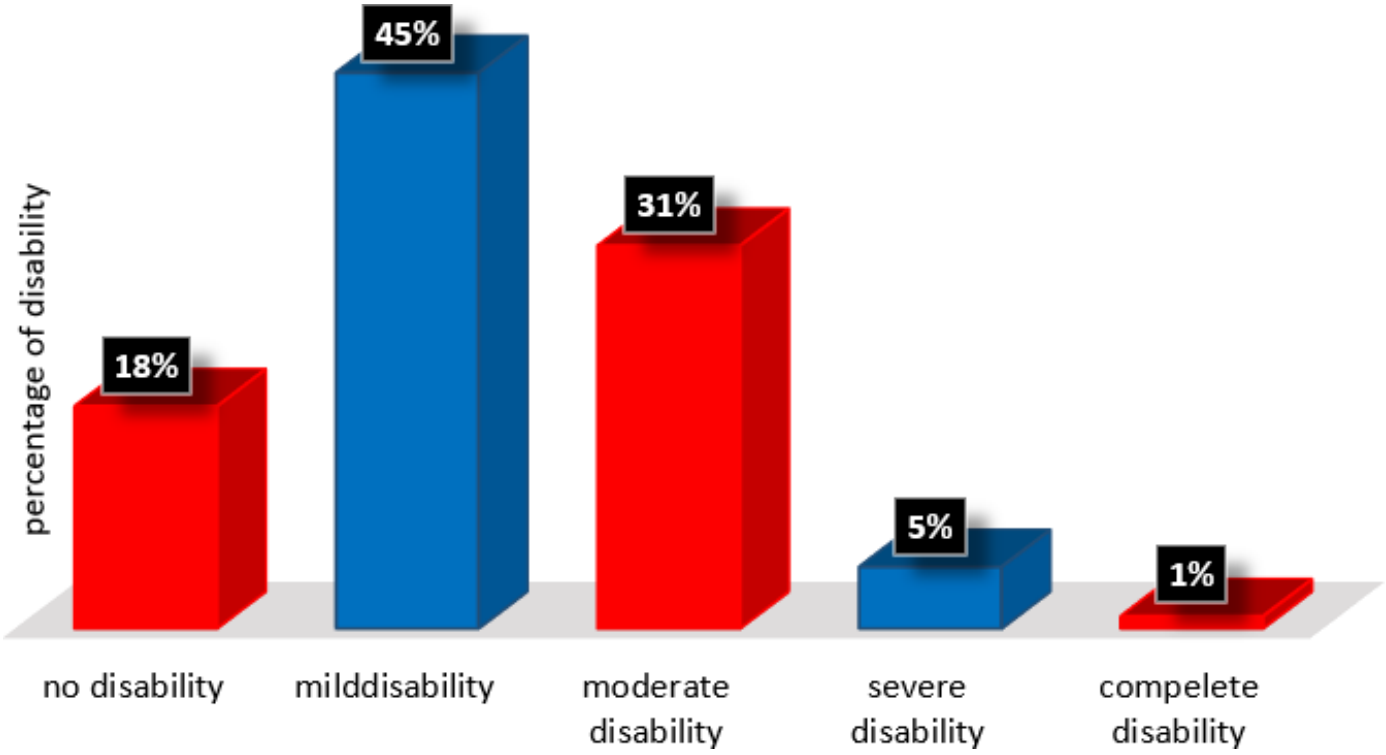

Figure 3: Percentage of Neck Disability in Girls

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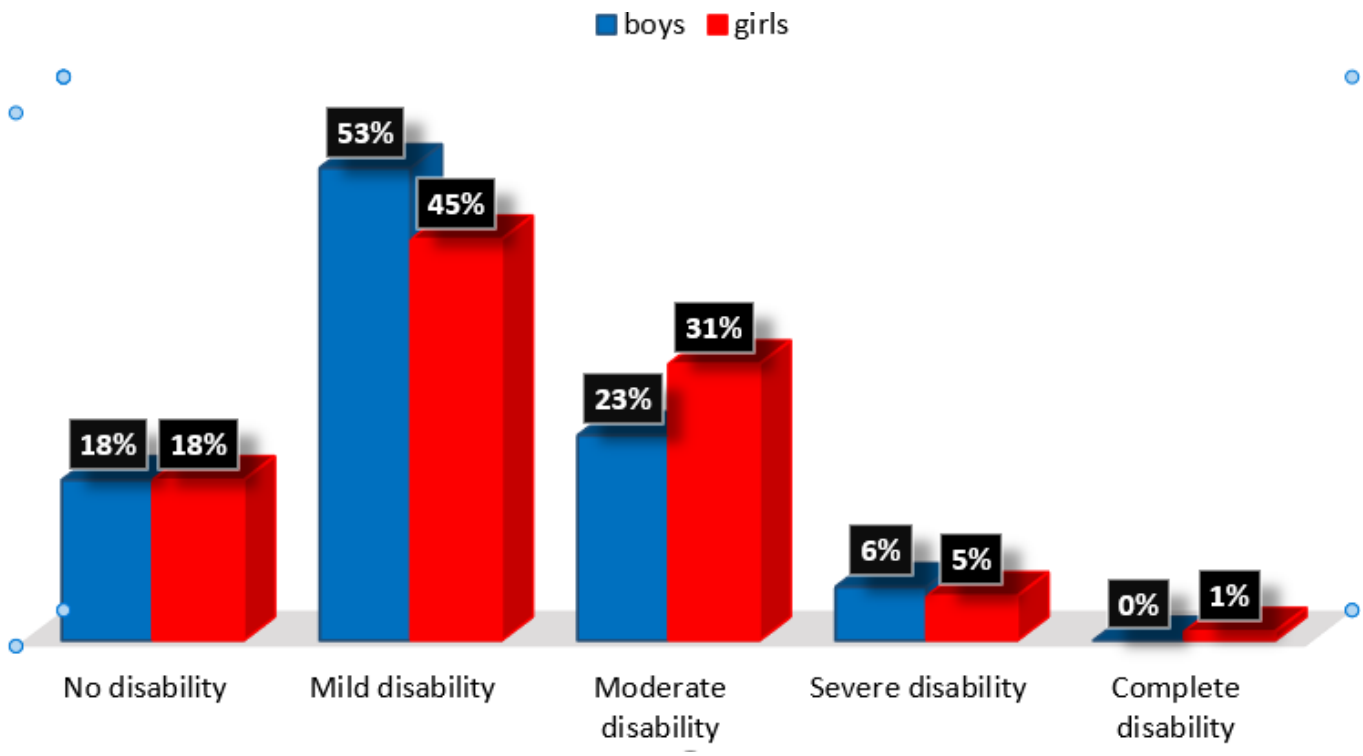

Figure 4: Relationship between Gender and Disability

	Mean	**SD**	**95% Confidence Interval**		**r value**	**P value**
			Minimum value	**Minimum value**		
NDI Score	11	7.33	0.7240	0.8303	0.7828	0.0001
Working hours	3.78	0.86				

Table 3: Correlation between Working hours and NDI Score

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	Mean	SD	95% Confidence Interval		r value	P value
			Minimum value	Minimum value		
NDI Score	11	7.33	-0.02873	0.2397	0.1074	0.1215
Gender	1.48	0.50				

Table 4: Correlation between Gender and NDI Score

The present study includes 209 students of the computer science department of Uka Tarsiidae University. Out of which 107 were boys and 102 were girls. The age of the participants ranged between 19-25 years and the mean age remained 20.92 ± 1.03 years. (Table 4.1)

Out of 209 participants 103 were suffering with mild disability, 57 with moderate disability, 37 with no disability, 11 with severe disability and 1 with complete disability. (Table 4.2)

Out of 209 participants 49% were suffering with mild disability, 27% with moderate disability, 18% with no disability, 5% with severe disability and 1% with complete disability. (Figure 4.2)

The percentage of mild disability was higher in boys (53%) than the girls (45%). The percentage of severe disability was higher in boys (6%) as compared to girls (5%), but the percentage of moderate disability was higher in girls (31%) than the boys (23%). There was only one Percentage of complete disability in the girls. (Figure 4.3, 4.4, 4.5).

Table 4.4 represents the correlation between working hours and neck disability score. Correlation coefficient (r)= 0.7824, P value is <0.0001, shows extremely significant correlation.

Table 4.5 represents the correlation between gender and neck disability score. Correlation coefficient (r)= 0.1074, P value is 0.1215, shows non-significant correlation

DISCUSSION

This is a cross-sectional study with a primary aim to find out the prevalence of neck pain among students of the computer science department. Neck pain is mainly a self-reported condition. The neck disability index was used in this study. In epidemiological studies for neck pain prevalence, different definitions have been used. There is no "gold standard" measurement tool for estimating the prevalence of neck pain among populations. So, the questionnaire is considered to be an important tool in research. In the present study, there were a total of 209 participants out of them 51% were boys and 49% were girls.

Aysha Siddiqui Kalim Khan et al[11] studied neck pain in computer users and the results of this study show that the prevalence of neck pain in computer users was 28% and the prevalence is more in females (60%) than in males. Dr. S A Shah et al [7]did a study on the prevalence of neck pain in computer operators and the result shows that among office employees working with video display units, the prevalence of self-reported non- specific neck pain was found to be 47% Koyyalamudi prudhvi et al[19] did study on self-reported musculoskeletal pain among dentists and the result shows that the prevalence is more in male than females.

In our study, no difference was found in the prevalence rate of neck pain between boys and girls (82%), which is contrary to the previous studies this could be due to the disproportionate sample size between boys and girls (51% vs. 49%). The correlation was done between gender and NDI, which shows a negative

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correlation. A correlation between working hours and NDI was also done which shows a positive correlation. It indicates that as working hours will increase, the NDI score will also increase. In this study, the mild disability was higher among students. it can progress from mild to severe disability and may produce further disabilities of cervical spine. So ergonomic interventions such as computer workstation redesign and ergonomic training should be advised to students. In our study, the prevalence of neck pain was 82% which is higher than the previous studies. The reason could be that the computers are widely used by students. In a study done by Noack-Cooper et al [18] students reported more hours of work per day on computers than professionals. Musculoskeletal Complaints are also more prevalent among college students using computers than computer-using professionals.

CONCLUSION

The prevalence of neck pain was found higher among students of the computer science department of Uka Tarsiidae University. It was also found that neck pain was associated with working hours of computer use. The study proposed that computer user students should take breaks of a few seconds in between and should be educated and trained for ergonomically conducive environments.

CONFLICT OF INTEREST:

There is no conflict of interest

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