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PREVELANCE OF NECK PAIN AMONG STUDENTS USING HARD COPIES FOR STUDIES IN COMPARISON TO STUDENTS USING SOFT COPIES

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Abstract:
The objective of this study was to investigate the neck problems arising among students because of use of laptops and computers. A cross sectional survey was administrated in Gujranwala Institute of Rehabilitation sciences, Punjab University and Gift University. Undergraduate students from different institutes of Gujranwala participated in this survey. Opinion from Participants was taken regarding the neck problems arising because of using soft copies by comparing them with the students using hard copies. For this purpose, a well-structured questionnaire was used to investigate neck problems among students. SPSS software was used for Data analysis. We have found that most of the participants were females. The study aimed to examine the influence of neck pain arising due to use of computer, laptops and tablets. Female students reported high incidence of neck pain because of using soft copies as compare to male students.

Keywords: *Soft copies, Hard copies, Neck pain, undergraduate students.*

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INTRODUCTION:

Neck problems are more common in adults due to usage of handheld devices with less frequent pauses and bad posture for prolonged time. Neck symptoms have been associated with low or high screen position, shoulder symptoms with high screen position and shoulder elevation in computer mouse users,13 and the risk of NP with poor placement of keyboard.14 Use of keyboard for ≥4 h during a working day has been associated with shoulder, wrist, or hand pain but not with NP. (1)

Neck pain causes more discomfort and reduces working output especially in students. The observed associations indicate that time spent on screen-based activity is a contributing factor to physical complaints among young people, and that effects accumulate across different types of screen-based activities.(2)

Musculoskeletal problems related to neck are most commonly seen in the form of neuritis, bursitis, neuralgia, rheumatism, neck pain, neck sprain, tenderness, aches, stiffness, weakness, tingling sensation in neck region and throughout the upper extremities, weakness, numbness, camps and swelling.

Neck discomfort is resulting in increased number of student absentees from colleges and universities. This increased number of student absentees results in their decreased study performance. Reported consequences of laptop use included technical faults, service and location limitations, hardware and software limitations, user limitations and physical consequences to the user. Sixty percent of students reported discomfort with laptop use and 61% of participants reported discomfort with carrying their laptop. Associations between school attended and year level with time on task and discomfort reports were evident. (3)

Computer pointing devices such as the mouse are widely used. Despite this, the relationship between musculoskeletal symptoms and mouse use has not been established. The aim of this cross-sectional study was to determine whether a relationship existed between computer mouse use and musculoskeletal symptoms.

Computer keyboard use has been associated with musculoskeletal injuries. Most people now use a pointing device such as the mouse to supplement the computer keyboard. Additional risk factors related to mouse use have the potential to increase prevalence of computer-related injuries.

Study Gap: There has been very limited research previously on this topic and has never been conducted in the Gujranwala in the past.

RATIONALE:

The benefit of our study is to determine the prevalence of neck pain in the students who use laptops, computers and mobiles for their study purpose. It will be beneficial for the society in terms of postural awareness and use of ergonomically designed equipment.

Research Question: Is Neck pain more common among Students using Soft copies for studies as compared to the students using hard copies?

LITERATURE REVIEW:

Bart N Green and J Can Chiropr Assoc. et al (2008) conducted a review that identifies public health aspects of neck pain as associated with computer use. While some retrospective studies support the hypothesis that frequent computer operation is associated with neck pain, few prospective studies reveal causal relationships. Many risk factors are identified in the literature. Primary prevention strategies have largely been confined to addressing environmental exposure to ergonomic risk factors, since to date, no clear cause for this work-related neck pain has been acknowledged. Future research should include identifying causes of work related neck pain that appropriate primary prevention strategies may be developed and to make policy recommendations pertaining to prevention.(4)

Shan Z and coworker et al,(2013) conducted an Co-relational Analysis of neck/shoulder Pain and Low Back Pain with the Use of Digital Products, Physical Activity and Psychological Status among Adolescents in Shanghai Three thousand sixteen valid questionnaires were received including 1,460 (48.41%) from male respondents and 1,556 (51.59%) from female respondents. The high school students in this study showed NSP and LBP rates of 40.8% and 33.1%, respectively, and the prevalence of both influenced by the student's grade, use of digital products, and mental status; these factors affected the rates of NSP and LBP to varying degrees.(5)

L Smith et al, (2009) conducted a research on prevalence of neck pain and headaches as a influence of computer use and other associative factors. Headaches and neck pain are reported to be among the most prevalent musculoskeletal complaints in the general population. A significant body of research has reported a high prevalence of headaches and neck pain among adolescents. Sitting for lengthy periods in fixed postures such as at computer terminals may result in adolescent neck pain and headaches. The aim of this paper was to report the association between computer use (exposure) and headaches and neck pain (outcome) among adolescent school students in a developing country. A cross-sectional study was conducted and comprehensive description of the data collection instrument was used to collect the data from 1073 high-school students. Headaches were associated with high psychosocial scores and were more common among girls. We found a concerning association between neck pain and high hours of computing for school students, and have confirmed the need to educate new computer users (school students) about appropriate ergonomics and postural health. (6)

According to a study (Cook C et al) Computer pointing devices such as the mouse are widely used. Despite this, the relationship between musculoskeletal symptoms and mouse use has not been established. The aim of this cross-sectional study was to determine whether a relationship existed between computer mouse use and musculoskeletal symptoms in a sample of 270 computer mouse users. Factors demonstrating a significant association with symptoms were entered into a step-wise multiple logistic regression, adjusting for age and sex and controlling for potential interdependence between variables. No relationship was found between hours of mouse use per day and reported symptoms. A relationship was found between the variable of arm abduction which is specific to mouse use and symptoms in the neck. Relationships were found between non-mouse-specific risk factors such as stress, screen height and shoulder elevation The findings of this study support the hypothesis that mouse use may contribute to musculoskeletal injury of the neck and upper extremity.(7)

K. Jacobs et al conducted a research "University students' notebook computer use: lessons learned using e-diaries to report musculoskeletal discomfort. The objective of this pilot study was to identify if notebook accessories (ergonomic chair, desktop monitor and notebook riser) combined with a wireless keyboard, mouse and participatory ergonomics training would have the greatest impact on reducing self-reported upper extremity musculoskeletal discomfort in university students. In addition to pre-post computing and health surveys, the Ecological Momentary Assessment was used to capture change in discomfort over time using a personal digital assistant (PDA) as the e-diary. The PDA was programmed with a survey containing 45 questions. Four groups of university students were randomized to either intervention (three external computer accessories) or to control. Participants reported less discomfort with the ergonomic chair and notebook riser based on the pre and post survey data and the e-diary/PDA ANOVA analysis. However, the PDA data, adjusted for the effect of hours per day of computer use, showed no benefit of the chair and limited benefit from the riser. University students' use of notebook computers has increased. This study found evidence of a positive effect of an adjustable chair or notebook riser when combined with ergonomic training on reducing discomfort. Daily notebook computer uses of 4 h was confirmed as a risk factor. Without some form of ergonomic intervention, these students are likely to enter the workforce with poor computing habits, which places them on the road to future injuries as technology continues to play a dominant role in their lives.(8)

METHODOLOGY:

We had conducted a qualitative research by using a close-ended questionnaire (see Appendix A). A cross-sectional survey was administrated in the students from three different Universities of Gujranwala. Students were asked to rate their neck pain and some of its effects on their routine life. A verbal/written consent was taken from all the participants according to Helsinki Declaration (Appendix B).

Study design: comparative cross sectional study

Sample size: 355 students

Sampling technique: convenience sampling

Setting:

- Gujranwala Institute of Rehabilitation Sciences.
- Punjab University, Gujranwala Campus.
- Gift University, Gujranwala Campus.

Inclusion criteria: Students of Gujranwala Institute of Rehabilitation Sciences, Gift University Gujranwala Campus, Punjab University Gujranwala Campus.

Age Group: 18-25.
Both Genders Males and Females.

Exclusion criteria:
- Students suffering from congenital diseases.
- Structural Anomalies.
- Handicapped.
- Systemic Diseases.

MEASUREMENTS:
Data collection procedure: comparative cross-sectional survey
Data collection tool: questionnaire, Copenhagen Neck Functional Disability Scale (Appendix A)

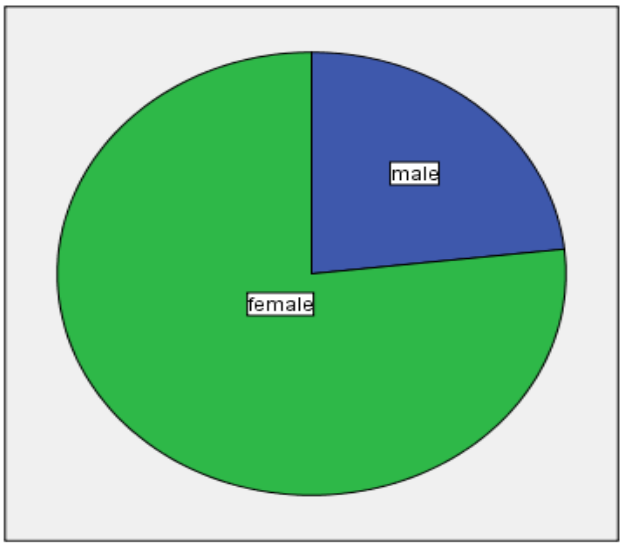
Time Line:

	Apr-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17
Preparation of project							
Data Collection							
Data Analysis & Report writing							
Submission							

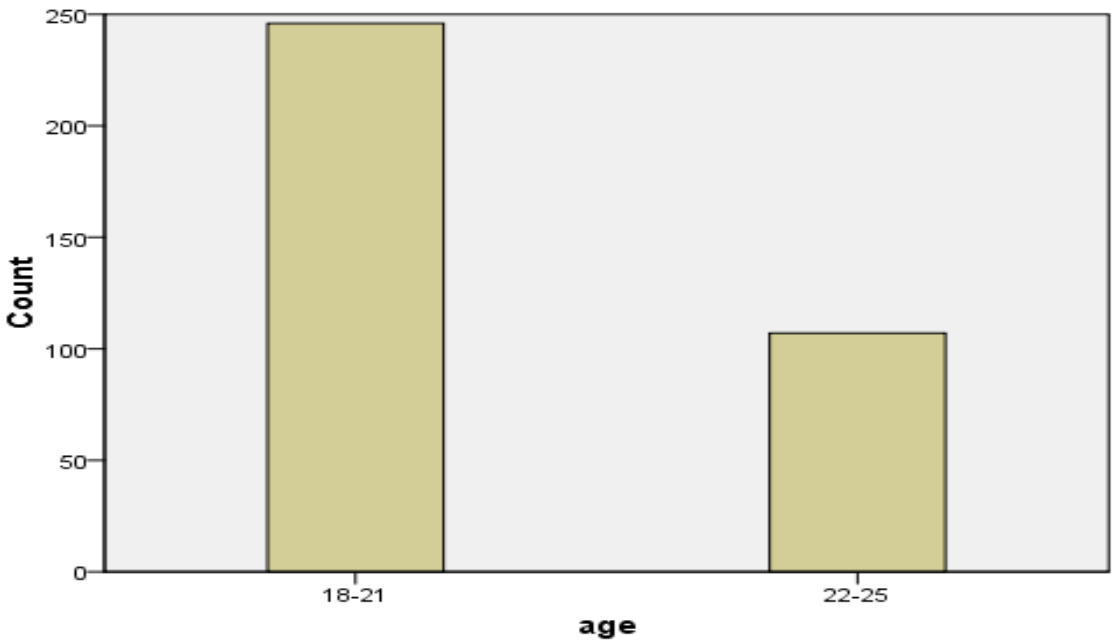
STATISTICAL ANALYSIS:
All the data was demonstrated as percentage or frequency. Data was analyzed using SPSS (Statistical package for social sciences) and expressed in form of charts.

RESULTS:
The research was completed and returned by 355 physical therapy students from Gujranwala Institute of Rehabilitation Sciences, Punjab University, Gujranwala campus and Gift University, Gujranwala campus.

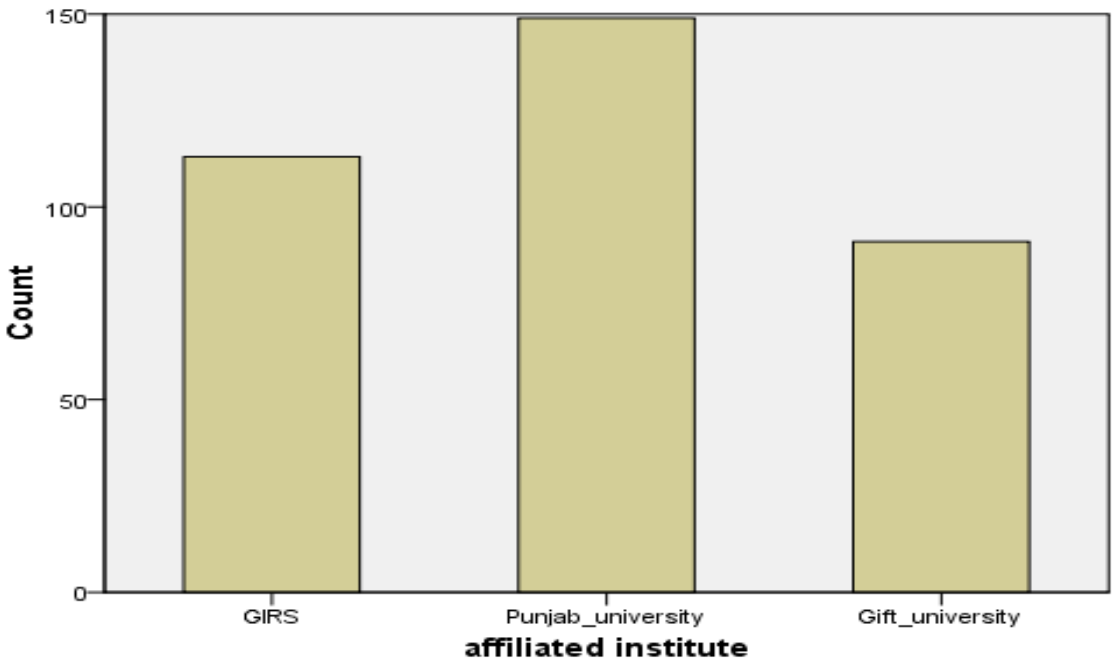
Participant's Characteristics: The majority of the students were Female (figure 1) and the age range were 18-21 years (figure 2). The greater ratio of the participants was from Punjab University, Gujranwala campus.



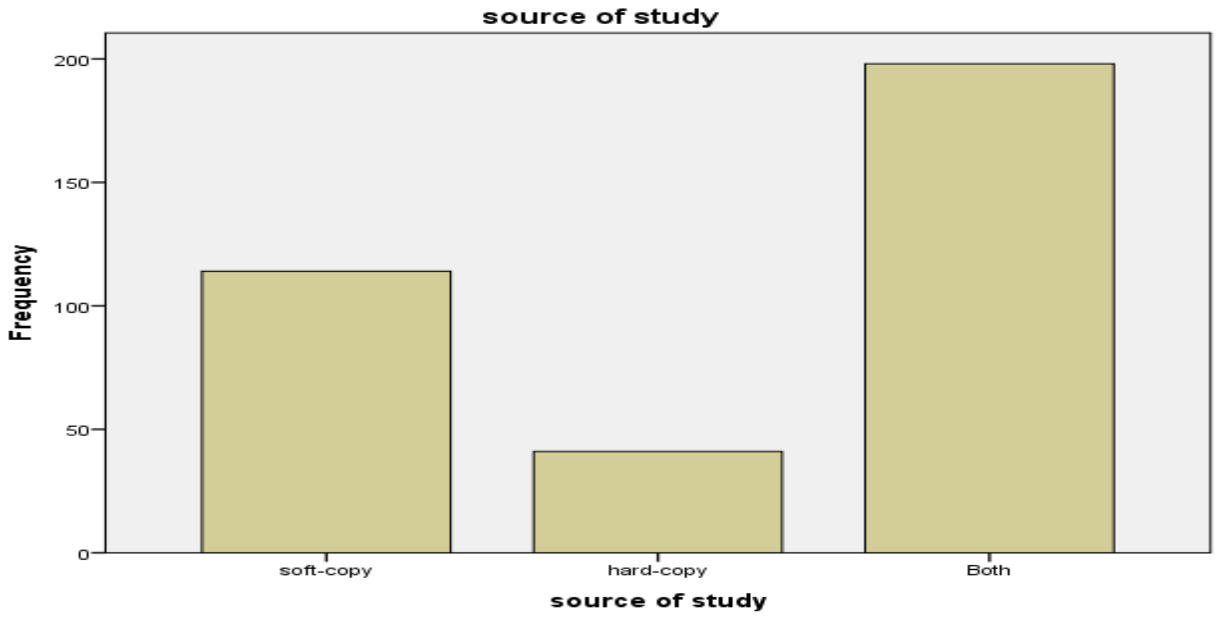
Female gender = 76.6%; Male gender = 23.4%
Figure 1: Participant's characteristics



Age 18-21 = 69.6%; Age 22-25 = 30.4%
Figure 2: Participants Age



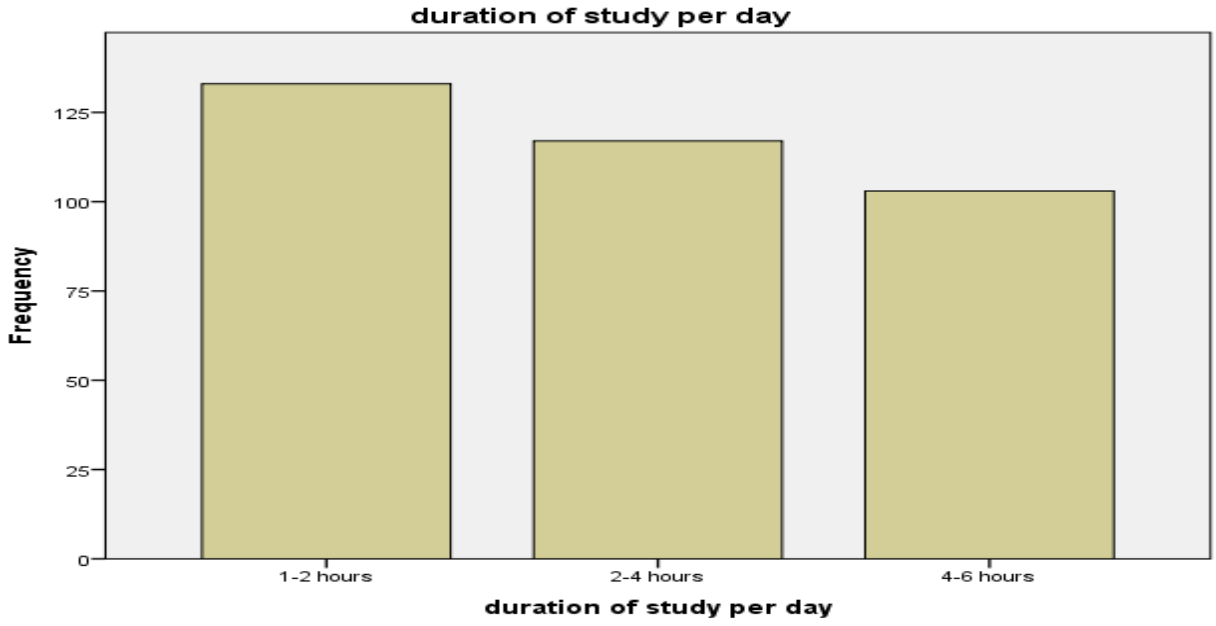
GIRS= 32.4%; Punjab university= 42.0%; Gift University= 25.6%; Most participants were from Punjab University.
Figure 3: Participant's affiliation



Soft copy/ Mobiles/ Laptop/ Computer Users= 32.1%; Hard copy/ book users= 11%; Both= 56.1%

Source of study of most of the participants was both soft copies and hard copies.

Figure 4: Source of study



1-2 hours per day= 37.5%; 2-4 hours per day= 33.0%; 4-6 hours per day= 29.6%

Most of the participants were studied 1 to 2 hours per day.

Figure 5: Studying Hours

Gender vs. Source of study: Female use soft copies more than male.

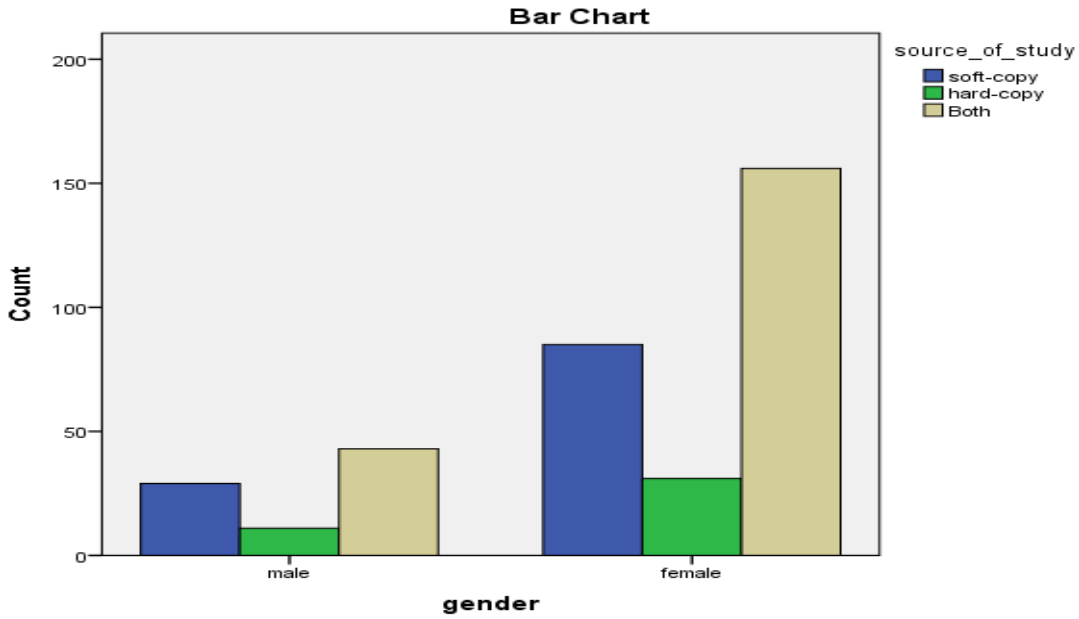
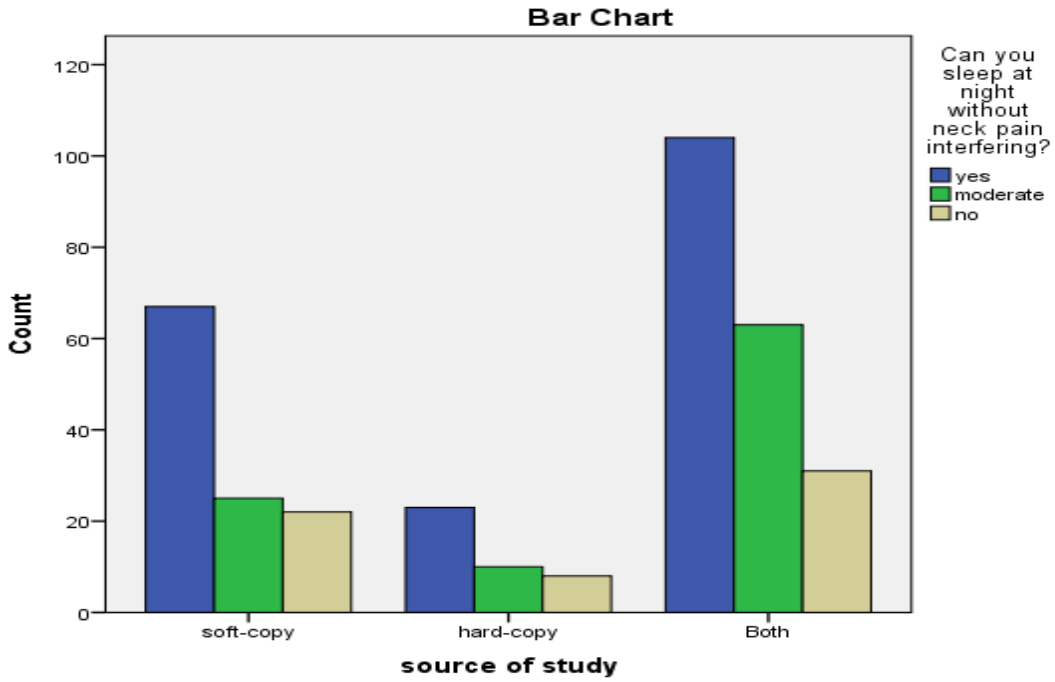


Figure 6: Gender Vs Source of study

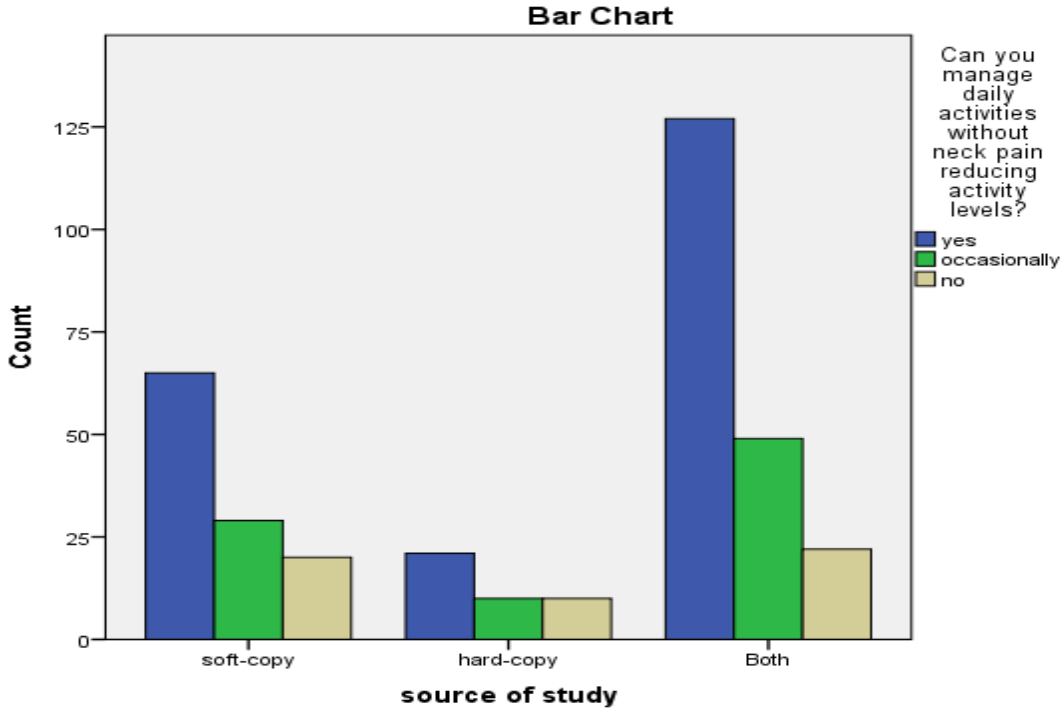
Sleep disturbances in soft copy vs. hard copy users: Most of the participants consider that they can sleep at night without Neck Pain Interfering.



Most of the participants consider that they can sleep at night without Neck Pain Interference.

Figure 7: Sleep disturbances in soft copy vs hard copy users

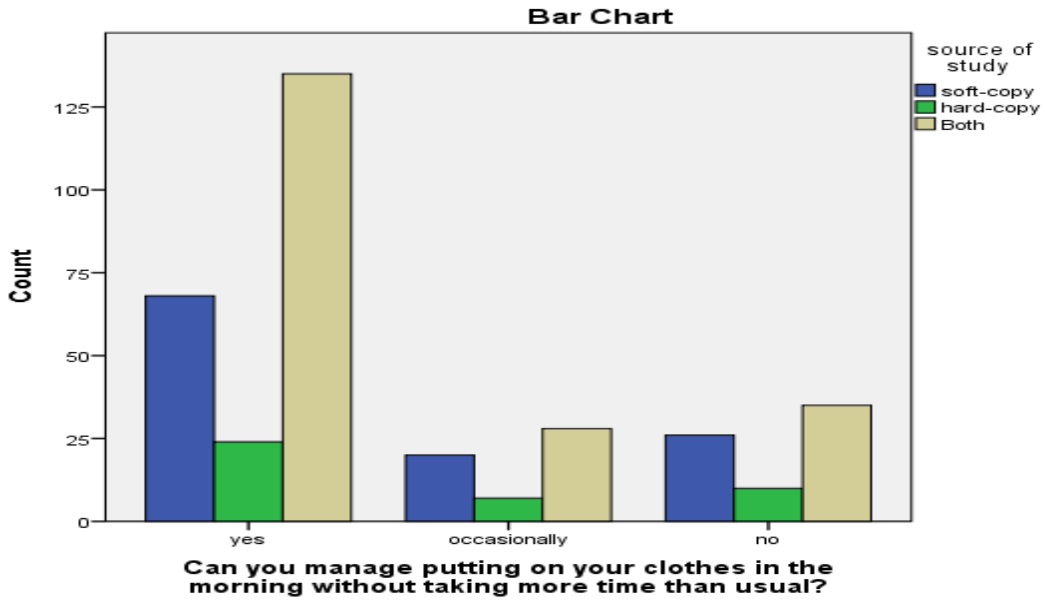
Management of daily Activities:



Most of the participants were able to manage their daily activities without Neck Pain reducing Activity levels.

Fig 8: Management of daily Activities

Self-grooming activities:



Most of the participants were able to manage putting on their clothes in the morning without taking more time than usual due to the Neck pain.

Fig 9: Self-grooming Activities

Bending activities: There is no strong association of affects in bending activities between soft and hard copy users but a slightly raised effects of neck pain while bending during brush the teeth has been observed in soft copy users in comparison with hard copy users.

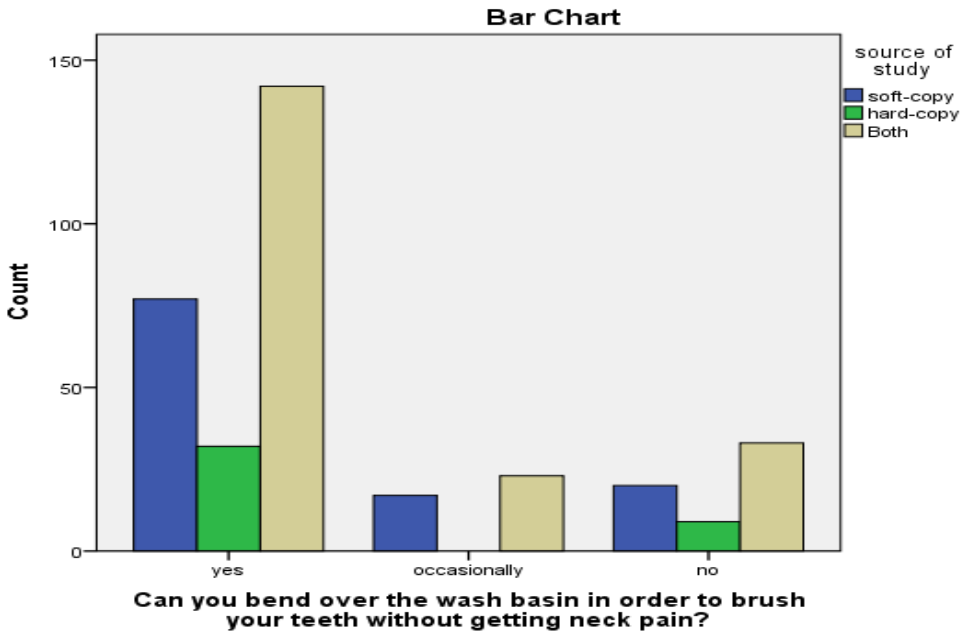


Fig 10: Bending Activities

Most of the participants could bend over the wash basin in order to brush their teeth without getting neck pain.

Stay at home Due to neck pain: Soft copy users spend more time than usual at home due to neck pain in comparison with hard copy users or book readers.

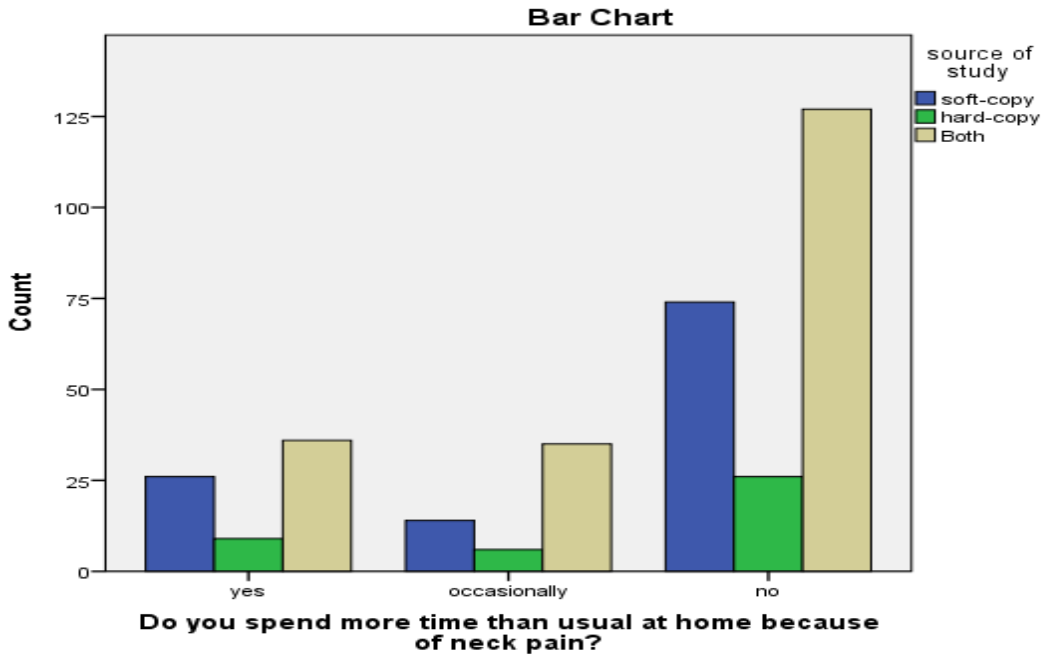


Fig 11: Stay at home due to neck pain

Prevention from lifting heavy objects due to neck pain: It has been observed that soft copy users are more prevented from lifting heavy objects weighing from 2-4kg due to neck pain than hard copy users.

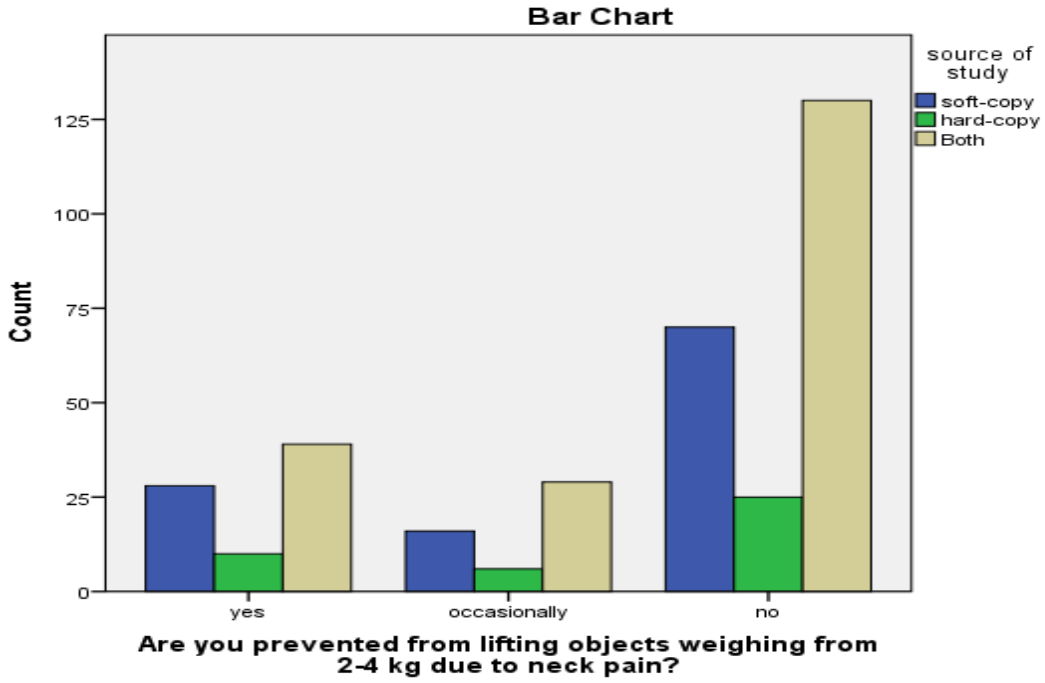


Fig.12: Lifting heavy objects

Most of the participants could lift the heavy objects weighting from 2-4kg due to the neck pain.

Reduced reading activity due to neck pain: It has been observed that Soft copy users reduce their reading activity due to neck pain more than hard copy users or book readers.

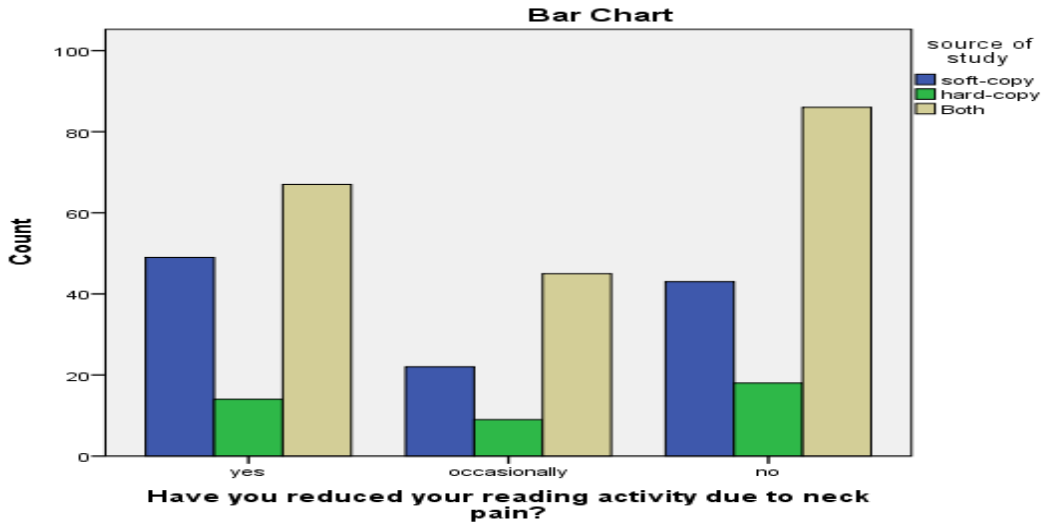


Fig13: Reduced reading activity

Most of the participants could not feel that their reading activity is reduced due to the neck pain.

Bothered by headaches: It is observed that soft copy users bothered by headache during the time they have had neck pain more than the hard copy users.

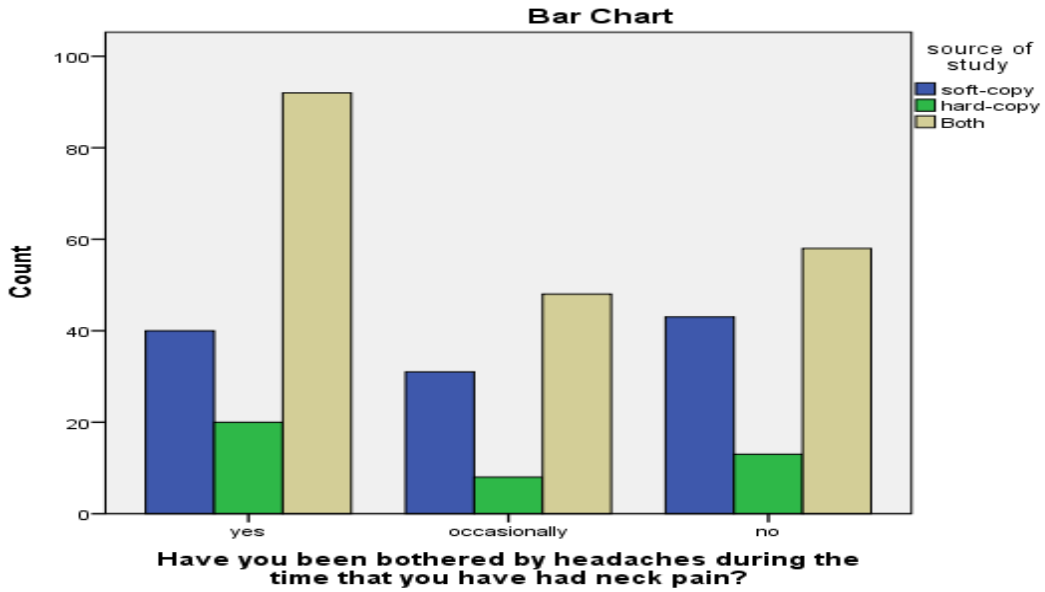


Fig. 14: bothered by headache

In general Most of the participants had been bothered by headaches during the time that they have had Neck pain.

Effect of neck pain on Ability to concentration: It has been observed that soft copy users feel reduced ability to concentrate due to the neck pain in comparison with book readers/ hard copy users.

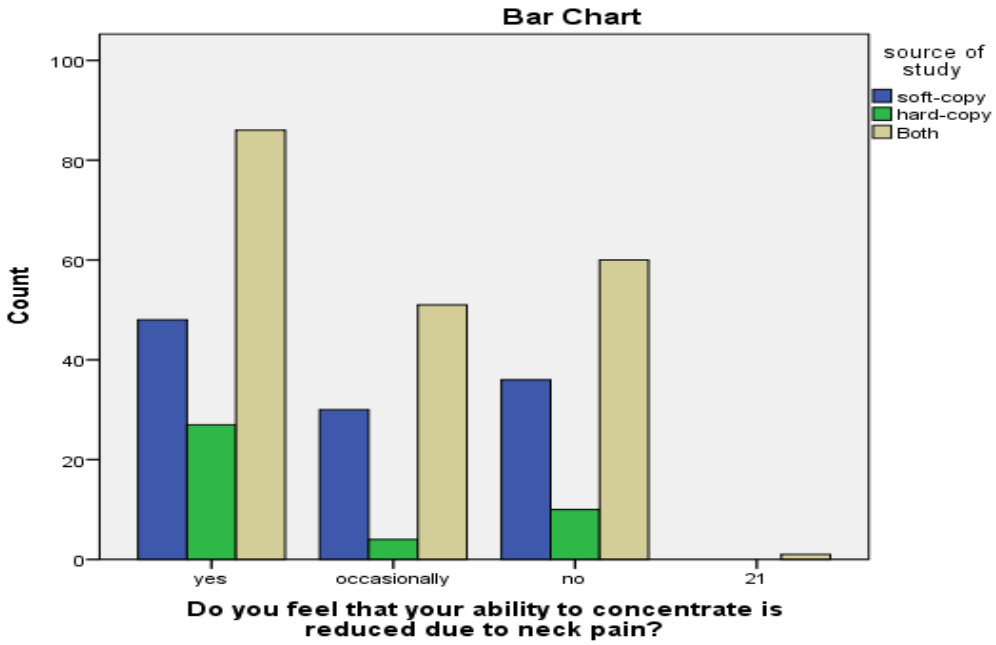


Fig. 15: Ability to concentrate

Most of the participants felt that their ability to concentrate is reduced due to the neck pain.

Prevention from participation in leisure activities due to neck pain: Soft copy users prevented from participation in leisure activities more than the hard copy users.

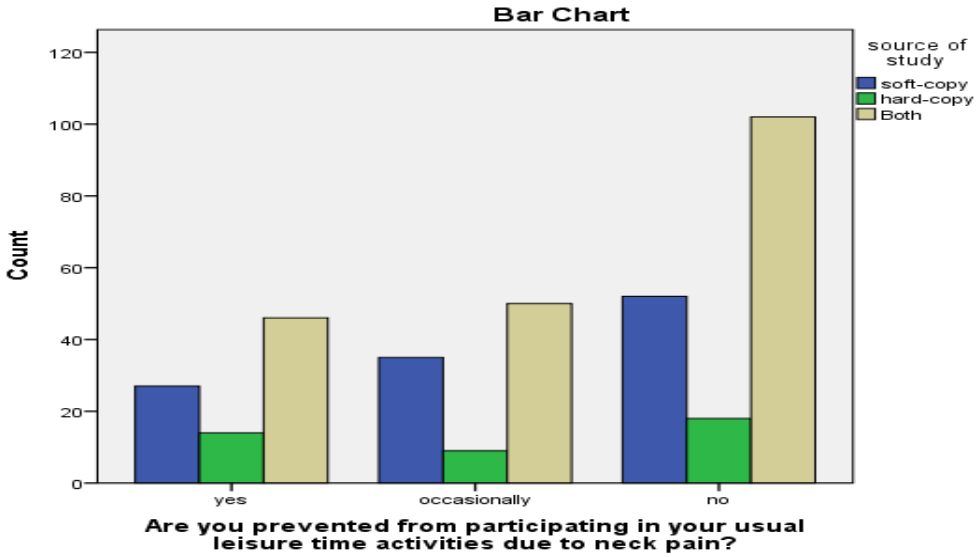


Fig. 16: Participation in leisure activities

Most of the participants couldn't feel that neck pain is preventing them from participating in their usual leisure time activities.

Remain in bed due to neck pain: Soft copy users remain in bed for longer time than usual due to the neck pain in comparison with hard copy users.

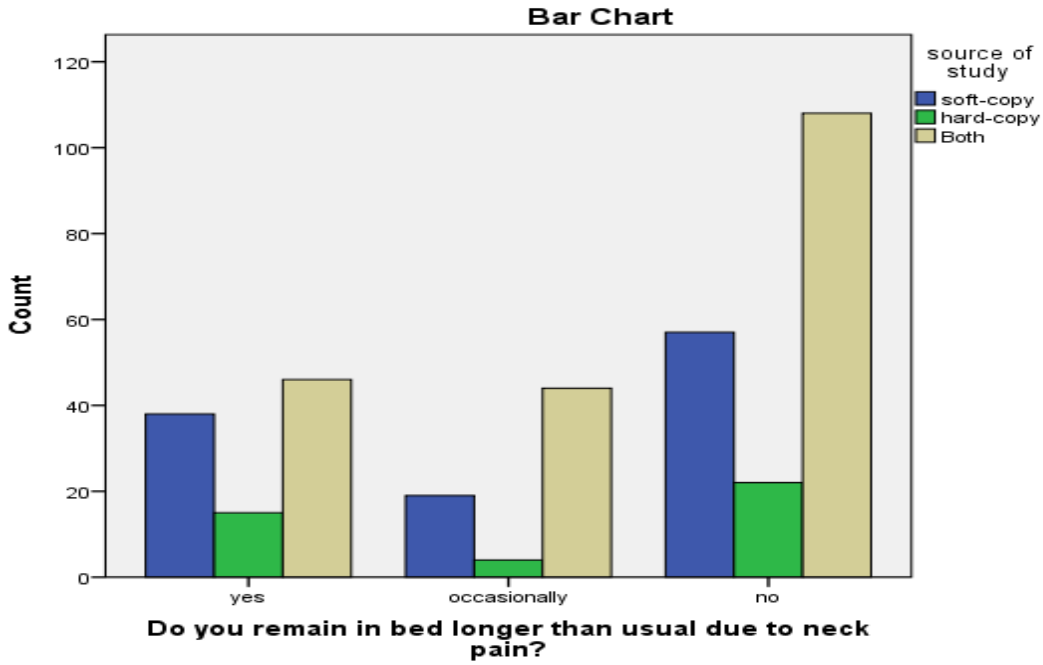


Fig. 17: Remain in bed

In general, most of the participants had not been bed bound due to the neck pain.

Effect of neck pain on Emotional relationships: Participants using soft copies felt more that neck pain influence their emotional relationships with their nearest family, in comparison with the participants using hard copies.

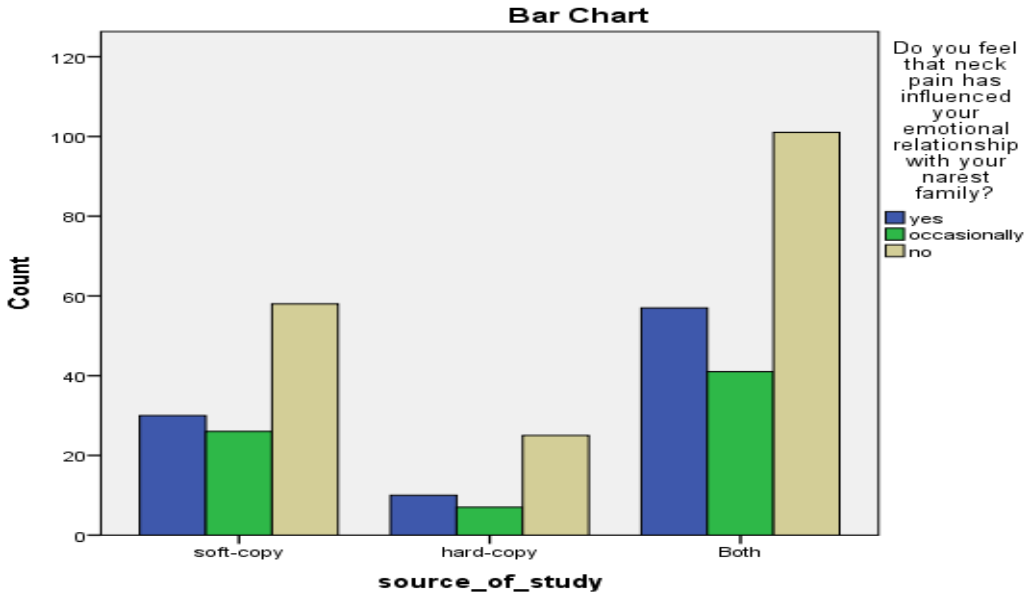


Fig. 18: Emotional Relationships

Most of the participants couldn't feel that neck pain is influencing their emotional relationships.

Effect of neck pain on Social contacts: Most of the soft copy users in comparison with hard copy users gave up their social contacts due to neck pain during past two weeks.

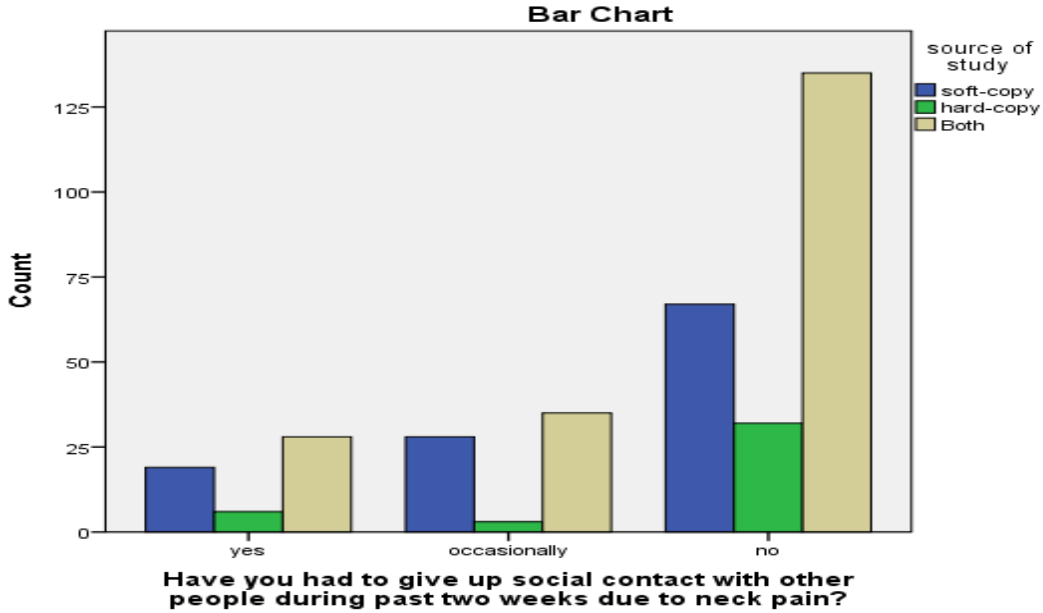
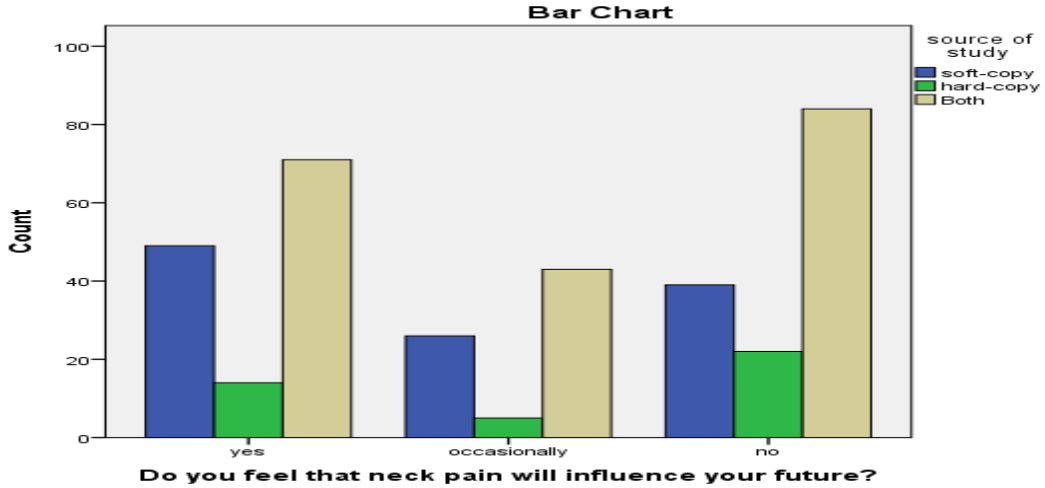


Fig. 19: Effect on social contacts

Most of the participants could not give up their social contacts due to the neck pain during past two weeks.

Influence on future:



Most of the participants who were soft copy users felt that Neck pain will influence their Future.

Fig. 20: Influence on future

DISCUSSION:

The main focus of this study was to compare the prevalence of neck pain among undergraduate students using soft copies for preparation to the students using hard copies or books. This study assesses the risks of Neck pain among students because of frequent use of mobile phones, laptops, tabs, personal computers etc. for study purpose for prolonged durations

Findings of research shows that incidence of neck pain much higher among soft copy users as compared to hard copy users/ book readers.

Data indicates that 76.6% participants were female and 23.4% participants were male. According to previous studies it is said that in our community, females are more prone to acquire neck pain and male due to their strong body physique are less affected.

According to results of our study, majority of the participants were from Punjab University, Gujranwala campus. In research more students who use soft copies are from Punjab University and Gujranwala institute of Rehabilitation sciences.

Various researches have been done on this topic, which shows that there is an increasing trend towards use of soft copies for study purpose in various universities and colleges. As a consequence of this increasing trend Incidence of problems of neck among students is also increased. The primary risk factor of Neck pain arising due to use of handheld devices/ soft copies is poor ergonomics and bad posture.

CONCLUSION:

We concluded that the students using soft copies for studies were affected more than the students using books/ hard copies. This study reveals that the students using handled devices (mobile phones, tabs etc.) are more likely to get neck pain.

The health care professionals need to focus on the postural awareness among students.

There is need to motivate the students through seminar, workshops and conferences regarding to postural awareness and use of ergonomically designed furniture and equipment.

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Appendix-A

Neck Problems among Students Using Soft Copies for Exams Preparation Comparing with the Students Using Hard Copies.

Name: _____ Age: _____
Institute: _____ Gender: _____
What is your source of study, mostly?
Softcopies (laptop, computer, Mobile) Hard copies both
I study for _____ hours, while using soft copy
1-2 hours/day 2-4 hours/day 4-6 hours/day other/more

Copenhagen Neck Functional Disability Scale

Please indicate how your neck pain has been affecting you **during the last week or other agreed time period** by marking a tick in the appropriate box in the columns to the right of each question:

		yes	occasionally	No
1	Can you sleep at night without neck pain interfering?	0	1	2
2	Can you manage daily activities without neck pain reducing activity levels?	0	1	2
3	Can you manage daily activities without help from others?	0	1	2
4	Can you manage putting on your clothes in the morning without taking more time than usual?	0	1	2
5	Can you bend over the wash basin in order to brush your teeth without getting neck pain?	0	1	2
6	Do you spend more time than usual at home because of neck pain?	0	1	2
7	Are you prevented from lifting objects weighing from 2-4 kg? Due to neck pain?	0	1	2
8	Have you reduced your reading activity due to neck pain?	0	1	2
9	Have you been bothered by headaches during the time that you have had neck pain?	0	1	2
10	Do you feel that your ability to concentrate is reduced due to neck pain?	0	1	2
11	Are you prevented from participating in your usual leisure time activities due to neck pain?	0	1	2
12	Do you remain in bed longer than usual due to neck pain?	0	1	2
13	Do you feel that neck pain has influenced your emotional relationship with your nearest family?	0	1	2
14	Have you had to give up social contact with other people during the past two weeks due to neck pain?	0	1	2
15	Do you feel that neck pain will influence your future?	0	1	2

Appendix-B

Consent Form:

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study

Signature of Participant _____ **Name of Participant_____**

Date _____