

## Review Article

# Prevalence of Neck Pain among Computer User-A Systematic Review

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**Abstract: Background:** Complaints of arm, neck, and shoulders (CANS) is a common problem among patients whose work involves computer use, but often ignored most importantly by the physicians partly due to not being able to appreciate the importance of taking a careful detailed occupational history of exposure to a repetitive activity involving upper arms. **Method:** This systematic review includes cross-sectional study and observational study. Searching done by Google Scholar, PubMed and PEDro from 2013 to 2019. We used terms like-Neck pain, computer, work, information technology, professionals, pain, health problems, discomfort, musculoskeletal diseases, musculo-skeletal system and physiotherapy management. **Result:** Present outcomes show the prevalence of neck pain in computer user's females has high prevalence than males. The search resulted in 100 articles but only 07 articles were selected for the study based on criteria. **Conclusion:** Present review shows that prevalence of neck pain is higher in females when compared to males.

**Keywords:** Neck Pain, Computer user, health problem, information technology.

## Introduction

With the passage of time, there is advancement in technology. Due to this advancement in technology, our method of working has modernized. Like after the invention of computers, there is so much transformation in our working technique. It is used a lot in our office setups. Although it plays an essential role in our lives but it has some disadvantages. Continuous work on computer results in excessive tension on muscles of body especially musculature of neck which causes pain in the neck region<sup>1</sup>. The neck pain is a common cause of disability and health problem in the general population. Neck pain is one of the common musculoskeletal problems. Neck Pain can be caused by the stress over the musculoskeletal system due to postural disorders and may also be associated with other causes such as intervertebral disc herniation, nerve compression, or fracture. Prevalence of Neck pain is reported to range from 43% to 66.7%, which increases along with aging. Study conducted by March et al. on individuals over 65 years of age, the prevalence of NP was found to be 38.7%<sup>2</sup>.

The overall usage of computers is firmly related to expanded prevalence in neck and shoulder discomfort. The lifetime prevalence of neck pain is reported as high as 80%<sup>3</sup>. One of the causes of neck pain is whiplash injury, in which there is sudden flexion and hyperextension of the head. Degenerative changes in the vertebrae are also responsible for neck pain like spinal osteoarthritis. It affects spinal intervertebral discs and facet joints. Bony spurs develop which pinch a spinal nerve root and thus it causes inflammation and pain in neck region. In some serious cases, patient does not have any symptoms of degeneration although these changes cause pain, problems relating to nerves and hardening of the neck and cervical spine<sup>4</sup>.

Several interventions have been proposed to rectify the postures of computer users through self-efficacy, including internet training<sup>5</sup> and real-time visual feedback<sup>6</sup>.

Nevertheless, education regarding posture has its role in preventing adverse postures and movements<sup>7</sup>. Proper rest breaks, physical exercise, adequate sleep and relaxation at home are effective strategies to cope with the overall health problems among frequent computer users such as software professionals<sup>8</sup>.

Use of an external keyboard has shown to be beneficial in reducing the neck and shoulder pain<sup>9,10</sup>. In environments where external devices are not available a 12° incline placed on a standard height desk may be the most desirable peripheral for portable computers for improving head and neck posture<sup>11</sup>, whereas setting the monitor tilt angle at 130° in a notebook computer has shown to significantly reduce the neck and shoulder discomfort<sup>12</sup>.

Thus, this review was conducted to determine the neck pain in computer user.

## **Methods**

This review study is performed in accordance to PRISMA-Preferred Reporting Items for Systematic Reviews and Meta Analyses<sup>13</sup>.

## **Search Strategy**

The searching was done in PubMed, Google Scholar and PEDro. Key words like-Neck pain, computer, work, information technology, professionals, pain, health problems, discomfort, musculoskeletal diseases, musculo-skeletal system and physiotherapy management. We included past 07 years articles published in English language only from 2013-2019.

The title and abstracts of all articles in the searches were screened in accordance with the inclusion and exclusion criteria to identify potentially eligible articles. Full texts of potential articles were read and assessed independently by the two reviewers.

## **Inclusions and exclusion criteria**

We included cross sectional studies that are observational assessing neck pain in computer users. We excluded studies containing “computer user and neck pain” in the title but not being correct in terms, as those articles evaluated neck pain in other users.

## **Data Extraction**

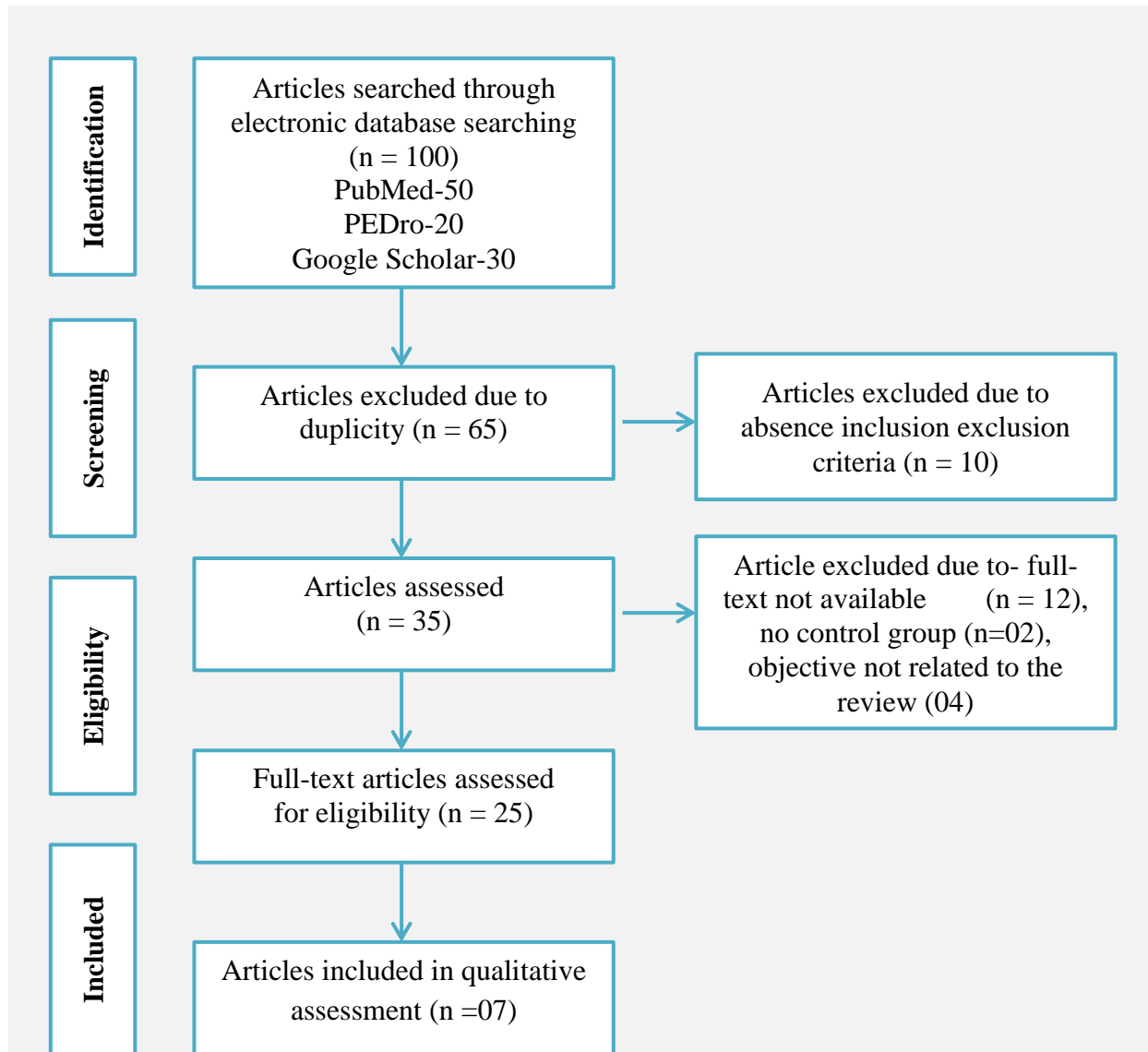
Data were extracted to and the following features were integrated into the database: number of participants, methods of inclusion, and the prevalence of neck pain categorized by severity.

## **Results**

### **Studies identified**

After implementing the inclusion and exclusion criteria, 100 articles were retrieved using the key words-Neck pain, computer, work, information technology, professionals, pain, health problems, discomfort, musculoskeletal diseases, musculo-skeletal system and physiotherapy management. 65

articles were excluded as they were found in more than one database. For eligibility criteria 35 articles were screened. Further 28 articles excluded because either they were not available in full text, objective not available, they did not meet exclusion and inclusion criteria or no control group (Figure-1). Finally, 07 articles were selected by agreement for quality assessment phase.



**Figure 1. Flow diagram showing the screening and selection of articles**

### General data of the included studies

Selected articles in this review are summarized in **Table 1** including given parameters: author-year, study design, subjects, outcome measures, study region and results. In 07 included studies in this study 6 were cross sectional study<sup>14,15,16,17,18,20</sup> one study is observational study<sup>19</sup>. All studies were conducted between 2013 and 2019. Number of participants in the studies ranged from 50 to 669.

### Outcome Measures

The key result tests are Age, Gender, Duration of job, Daily hours of work, Physical exercise, Self-administrable questionnaire, Semi-structured questionnaire, Neck Disability Index, Maastricht Upper Extremity Questionnaire, Chi square.

**Table 1. Description of the included studies**

Author	Study design	Subject	Study region	Outcome measures	Result
Younis N, et al. <sup>14</sup>	Cross sectional study	N=309	Punjab University Lahore, Govt. College University Lahore, Education University Lahore, and The Resource Group Lahore.	Self-administrable Questionnaire.	Female computer operators were more victims of neck pain as compared to male computer operators.
Bhalala SH. <sup>15</sup>	Cross sectional study	N=100 M-81 F- 19	Enwisen Consulting LLP, Adajan, Surat, Pranesh Agrawal & Co. Chartered Accountants, Chhapania Sheri, Surat, Finlogic technologies India Pvt. Limited, Udhana, Surat.	Semi-structured questionnaire, Neck Disability Index.	From this study it is concluded that 55 % of the people of age group 20 to 50 years have mild and moderate neck pain.
Rasim Ul Hasanat M, et al. <sup>16</sup>	Cross sectional study	N=185	Not Available	Self-administrable Questionnaire.	Intensive computer users are likely to experience at least one episode of computer-associated neck pain.
Mohan V, et al. <sup>17</sup>	Cross sectional study	N=206	Two medium- sized software companies in Bangalore.	Maastricht Upper Extremity Questionnaire, Chi- square	Complaints of arm, neck, and shoulders (CANS) is highly prevalent among computer professionals working in small and medium- sized companies. Provision of adequate workspace and ergonomic designs of workstations are the modifiable risk factors which can be addressed by the employers to reduce the morbidity associated with CANS. Employees could correct postures and improve work habits.
Zain A, et al. <sup>18</sup>	Cross sectional study	N=669	Computer operators from Lahore city.	Chi Square test	There was 42.90% prevalence of neck pain in computer operators of Lahore. It was also found that neck pain is associated with gender and smoking. According to this study, no significant association of neck pain was seen with working hours and family history of neck pain.
Sabeen F, et al. <sup>19</sup>	Observational study	N=50	Office workers (computer users) and students.	Individual demographic characteristics, Work environment factors, Total duration of daily sitting at work, Frequency of breaks from sitting, postural	So 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.

Khan ASK, Faizan M. <sup>20</sup>	Cross sectional study	N=50	NKP Salve Institute of Medical Sciences; Research Centre and Lata Mangeshkar Hospital, Nagpur (tertiary care and medical institute).	care. Age, Gender, Duration of job, Daily hours of work, Physical exercise.	The prevalence is more in females (60%). The neck pain increased with increase in age, 66% neck pain was found in people between 50-60 years. The prevalence of neck pain was low among those who do regular exercise, in our study only 30% of computer users do regular exercise out of which only 36% develop neck pain.
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## Discussions

Our review included the minimal quantity of participants which was 50, and the maximum was 669. We counted 1,569 participants. The based on the literature the prevalence of neck pain with a minimum prevalence of 36% and a maximum of 42.90%. One article found that 18% of People have mild neck pain and in young adults incidence of neck and shoulder pain is high<sup>15</sup>. Van Der Heuvel et al. concluded that sustained sporting activities have a favorable effect on neck/shoulder symptoms<sup>21</sup>.

Arie et al. found that workers who sat for more than 95% of the working time, the risk of neck pain was twice as high as for worker who hardly ever worked in a sitting position. From present study, we can say that people work more than 3 hour having 55% mild to moderate pain<sup>22</sup>. One of the study found that women had higher prevalence rates of upper extremity musculoskeletal complaints–region wise as well as overall, than men<sup>23</sup>.

Another cross-sectional study was conducted in Ahmedabad by Shah and Patel in 2015. According to that study, there was 47% prevalence of neck pain<sup>1</sup>. A cross sectional study was conducted by Janwantanakul et al. to find out the prevalence of musculoskeletal complaints in office workers. They reported that musculoskeletal issues relating to neck pain were 42%<sup>24</sup>. A cross sectional study was conducted to know the 1 year incidence of neck pain in office workers. Data were collected from 512 individuals. Cagnie et al. found that office workers have prevalence rate of 45.5% for the neck pain<sup>25</sup>. Another study was conducted by Diepenmaat et al. to find out the prevalence of neck pain in adults. He found that there is 11.5% prevalence of neck pain in adults<sup>26</sup>.

## Conclusion

This systematic review was conducted to investigate the prevalence of neck pain among computer user. While it is known that computer users have neck pain the cause is still an enigma. Future clinical research in this area should be prospective in design, evaluate effectiveness, efficacy, and cost effectiveness of primary preventive strategies for neck pain, and further explore the potential adverse effects of engaging in prolonged exposure to computer work at a young age.

**Conflicts of interest:** The authors declare no conflicts of interest.

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