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Prevalence of Neck Pain in Computer Workers in Surat City: A Cross-sectional Study

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ABSTRACT

Aim: The purpose of our study is to determine the prevalence of neck pain in computer workers.

Settings and Design: Cross-sectional study amongst neck pain in computer workers of 20-50 year old.

Methods and Material: A cross-sectional study was done. 100computer worker in that 81 male and 19 female, they should be working on computer for at least 3 hours / day of different company in Surat were surveyed after written informed consent with a semi-structured questionnaire including Neck Disability Index.

Conclusion: From this study it is concluded that 55 % of the people of age group 20 to 50 years have mild and moderate neck pain.

Key Words: Neck pain, Computer operators, Ergonomics

INTRODUCTION

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.[1,2] It was also described in the 18th century, along with other work related upper limb disorders by Bernardini Ramazzini- an Italian physician and the father of occupational medicine - when he said the diseases : "... arise from three causes; firstly, constant sitting, secondly the perpetual motion of the hand in the same manner, and thirdly the attention and the application of the mind..."[3] Musculoskeletal disorders of the neck and shoulder in office workers are likely influenced by prolonged static working positions,[4] leading to continuous activity of low-threshold motor units,

reduced local blood flow, accumulation of Ca^{2+}, and other homeostatic changes in the active muscle fibers.[5,6] Thus, pain symptoms appear to worsen during prolonged static muscle activity and repetitive job tasks.[7,8] The associated costs are enormous, as white-collar workers with neck/shoulder pain have a 35% increased risk of long-term sickness absence.[9]

Structures of neck:

There are seven vertebrae that are the bony building blocks of the spine in the neck that surround the spinal cord and canal. Between these vertebrae are discs, and nearby pass the nerves of the neck. Within the neck, structures include the neck muscles, veins, arteries, lymph glands, thyroid gland, parathyroid gland, esophagus, larynx and trachea. Diseases or conditions that affect any of these tissues of the neck can lead to neck pain.[10]

The cervical spine has a "C" shaped curve which opens in the back. In the healthy cervical spine displaying a moderate degree of lordosis, a good share of weight bearing is on the zygoapophyses because the line of cumulative loading of Compressive forces are posterior to the centre of the vertebral bodies. The more the cervical curve flattens, the more superimposed weight is shifted to the disc.[10, 11]

An unpleasant sensation that can range from mild, localized discomfort to agony. Pain has both physical and emotional components. The physical part of pain results from nerve stimulation. Pain is mediated by specific nerve fibers that carry the pain impulses to the brain where their conscious

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appreciation may be modified by many factors. The word "pain" comes from the Latin "poena". Neck is the spinal structure that supports the head. It is least protected structure compared to the rest of the spine. Due to its anatomical structure the neck is highly vulnerable to injury and from conditions that produce pain and restriction of motion. Forward head posture is one of the contributing factors for the postural neck pain which is habitually assumed by individual working on the computers.[12] Having your head rest too far forward can cause the 'C' shaped curve in your neck to decrease, and keeping your head too far back can accentuate it. These positions can increase the amount of stress placed on the muscles, ligaments, facets and discs in and around your neck. This undue stress can cause neck pain.[11]

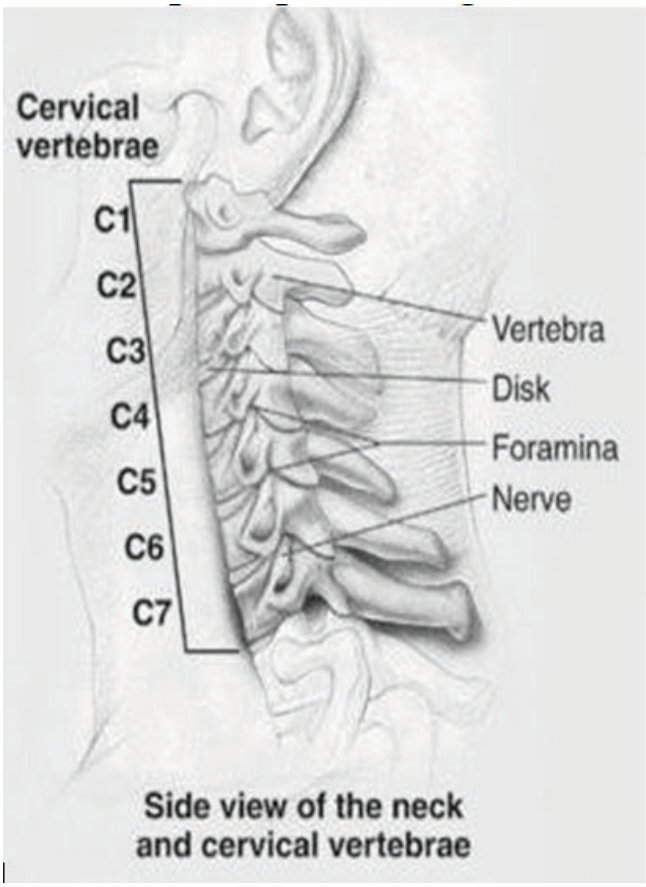

Figure 1: Side view of neck and cervical vertebrae

Sustained passive loading of such innervated tissue in functional sitting postures may provoke a local tissue reaction possibly causing pain. In computer professionals working is related to increasing hours of computer use and incomplete work rest cycle.[13,14,15] Musculoskeletal discomfort in neck, shoulder and upper extremity area in professional working on video display hours of computer use and incomplete work rest cycle, i.e. increased frequency of those using input device such mouse or key board.[15,16] By ergonomics interventions such as supporting the forearm on table-top, a reduction of postural load discomfort such as neck pain been achieved[17,18,19] Work organizational factors such as increasing work pressure or hurry and lack of job security or decision making opportunities as well as problem in work atmosphere may contribute to an increased occurrence of work related musculoskeletal complains.[20]

AIMS AND OBJECTIVES

Aim: To estimate the prevalence of neck pain in computer workers.

Objective: To study of consequences of neck pain in terms of disability in daily life.

MATERIAL AND METHODOLOGY

1. Statement of study:

The study of prevalence of neck pain in computer worker between age group of 20 to 50 years.

2. Significance of study:

This study will help to know about the prevalence of neck pain in computer operators in Surat city

3. Study design:

Study design: Cross-sectional study

Sampling method: Convenient sampling method

4. Sample size: 100 subjects

5. Sample source: The location for the research was selected as Surat city.

- Enwisen Consulting LLP, Adajan, Surat.
- Pranesh Agrawal & Co. Chartered Accountants, Chhapania Sheri, Surat.
- FINlogic technologies India Pvt. Limited, Udhna, Surat

6. Outcome Measure:

Neck Disability Index

7. Inclusion Criteria:

- Subjects willing to participate.
- Neck pain people of age group 20 to 50 years were included.
- Persons using computer more than 3 hours a day.
- Both males and females were included in this study.

8. Exclusion Criteria

- Any specific medical condition affecting the cervical spine. (such as ankylosing spondylitis, tumors, infection, and rheumatoid arthritis)
- Subjects below and above age group 20 to 50 years were excluded.

Material

Pen, Pencil, Paper, Questionnaire form

Questionnaire used:-

Neck Disability Index (NDI)

NDI questionnaire is designed to provide information of how neck pain affects a person's ability to manage in everyday life. The questionnaire has 10 components and each component has scoring 0 to 5. Thus total score achievable is 50. Greater score indicates greater disability.

scores (out of 50) 0-4 No Disability

5-14 Mild Disability

15-24 Moderate Disability

25-34 Sever Disability

>35 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.[28]

Procedure for data collection:

One hundred computer workers (19 females and 81 males) whose age ranged from 20 to 50 years participated in the study. Participation in the study was voluntary and informed consent was taken prior to participation. They were selected by convenient sampling. Workers were explained about this study and about the questionnaires that were to be filled prior to the participation. Questionnaires, Neck Disability Index was then handed out amongst the workers in the company and collected after being filled.

DATA ANALYSIS AND RESULTS

Table 1: Subject distribution according to Gender:

GENDER	WITH NECK PAIN %
MALE	81%
FEMALE	19%
TOTAL	100%

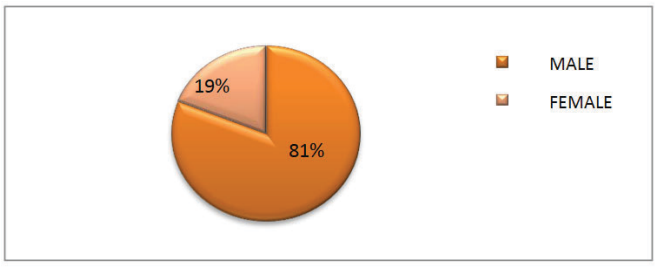

Chart 1: Effect of Neck pain in Gender.

Table 2: Subject distribution according to Age:-

Age	With neck pain
20-30	93%
30-40	5%
40-50	2%
Total	100%

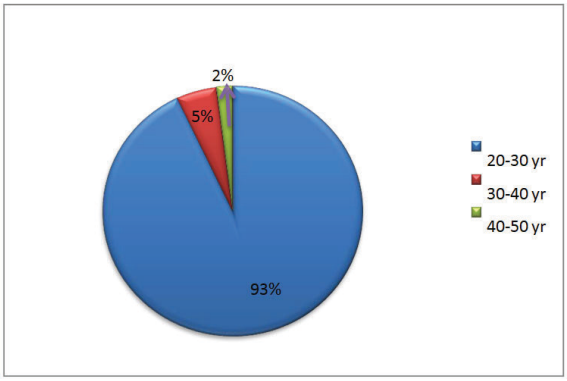

Chart 2: Neck Pain Distribution to Gender.

Table 3: Pain Intensity

Score	%
No pain	56%
Mild pain	18%
Moderate pain	13%
Fairly severe	8%
Very severe	1%
Worst	4%

From the above table we can say that:

- 56 % People have no pain at the moment.
- 18 % People have very mild pain at the moment.
- 13 % People have moderate pain at the moment
- 8 % People have fairly severe pain at the moment.
- 1 % People have very severe at the moment.
- 4% People have worst pain at the moment.

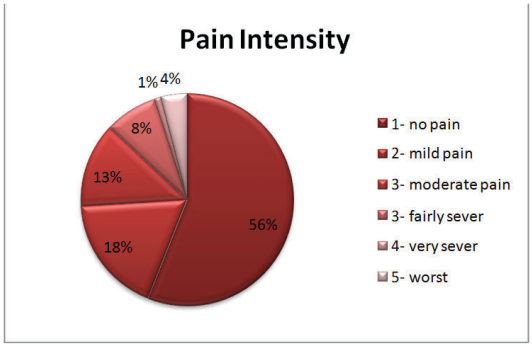

Chart 3: Pain Intensity Effects on Neck pain.

Table 4: Effects of Neck pain on Personal Care:-

SCORE	%
0	60%
1	10%
2	19%
3	7%
4	2%
5	2%

From the above study we can say that:

- 60% People can look after themselves without causing extra pain(0)
- 10% People can look after themselves normally but it causes extra pain(1)
- 19% People have pain to look after themselves and are slow and careful(2)
- 7% People need some help but manage most of their personal care(3)
- 2% people need help every day in most aspects of self-care. (4)
- 2% people do not get dressed; wash with difficulty and stay in bed. (5)

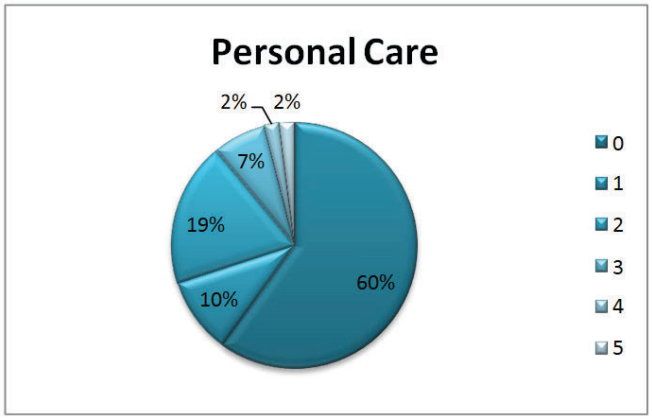

Chart 4: Effect of Neck pain on Personal Care.

Table 5: Effect of Neck Pain on Lifting:

SCORE	%
0	40%
1	30%
2	9%
3	13%
4	8%
5	0%

From the above study, we can say that:

- 40 % of People can lift heavy weights without extra pain.(0)
- 30% of People can lift heavy weight, but it gives extra pain (1)
- In 9% People, pain prevents them from lifting heavy weight of the floor but they can manage if they are conveniently positioned. (2)
- In13 % People pain prevents them from lifting heavy weights but they can manage light to medium weights if they are conveniently positioned. (3)
- 8% people can lift very light weight.(4)

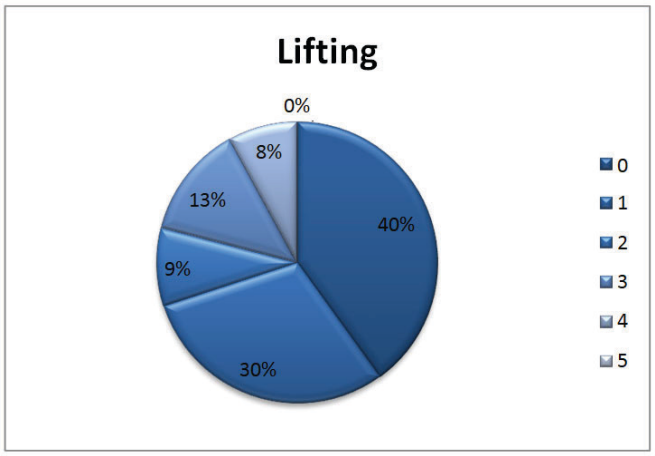

Chart 5: Effects of Neck pain on Lifting.

Table 6: Effects of neck pain on Reading:

SCORE	%
0	39%
1	27%
2	14%
3	14%
4	7%
5	0%

From the above study, we can say that:

- 39% People can read as much as they want to with no pain in their neck(0)
- 27% People can read as much as they want to with slight pain in their neck(1)
- 14 % People can read as much as they want with moderate pain in their neck(2)
- 14% People cannot read as much as they want because of moderate pain in their neck(3)
- 7% People can hardly read at all because of severe pain in their neck (4).

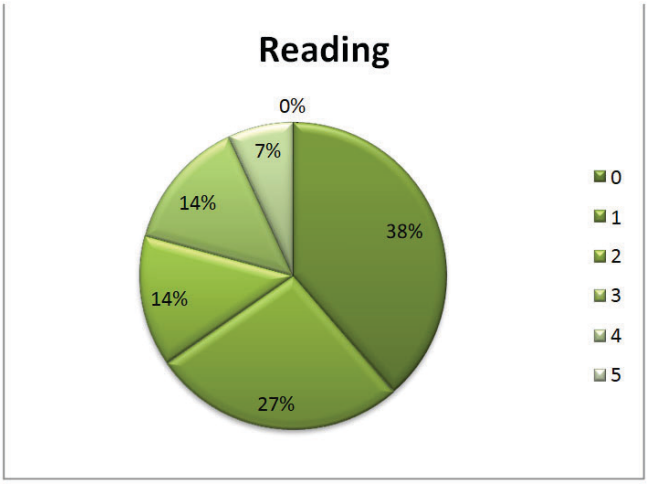

Chart 6

Table 7: Effects of Neck pain on Headaches:

SCORES	%
0	39%
1	29%
2	5%
3	10%
4	6%
5	15%

From the above study, we can say that,

- 39% people have no headaches at all(0)
- 29% People have slight headaches that come infrequently(1)
- 5% People have moderate headaches which come frequently(2)
- 10% People have severe headaches which come frequently(3)
- 6% People have severe headaches which come frequently. (4) 15%people have headaches almost all the time. (5)

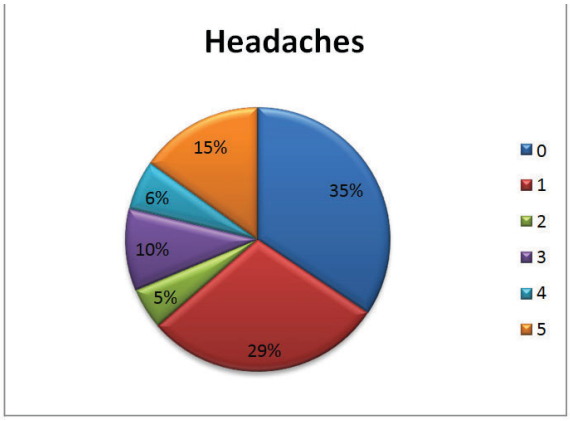

Chart 7

Table 8: Effects of Neck pain on Concentration:

SCORES	%
0	39%
1	29%
2	14%
3	1%
4	6%
5	11%

From the above study, we can say that:

- 39% People can concentrate fully when they want to with no difficulty (0)
- 29% People can concentrate fully when they want to with slight difficulty (1)
- 14% People have a fair degree of difficulty in concentrating when they want to(2)
- 1% People have a lot of difficulty in concentrating when they want to (3)
- 6% People have a great deal of difficulty in concentrating when they want to. (4)
- 11% people cannot concentrate at all. (5)

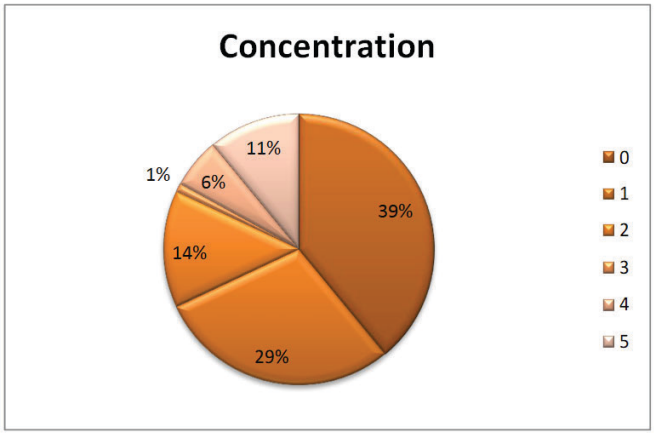

Chart 8

Table 9: Effects of neck pain on Work:

Score	%
0	47%
1	13%
2	17%
3	17%
4	4%
5	2%

From the above study, we can say that:

- 47% People can do as much as work as they want to(0)

- 13% People can do their usual work, but no more(1)
- 17% People can do most of their usual work, bit no more(2)
- 17% People cannot do their work(3)
- 4% People can hardly do any work at all. (4)
- 2% People cannot do any work at all. (5)

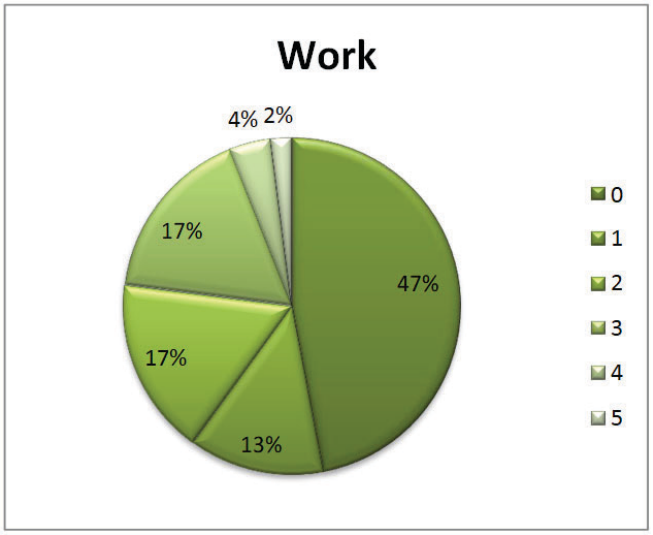

Chart 9

Table 10: Effects of Neck pain on Driving:

Score	%
0	36%
1	30%
2	8%
3	14%
4	2%
5	10%

From the above study, we can say that:

- 36% People can drive car without neck pain. (0)
- 30% People can drive car as long as they want with slight pain in neck. (1)
- 8% People can drive car as long as they want with moderate pain in neck. (2)
- 14% People cannot drive car as long as they want because of moderate pain in neck. (3)
- 2% People can hardly drive car at all because of severe pain in neck. (4)
- 10% People cannot drive car at all. (5)

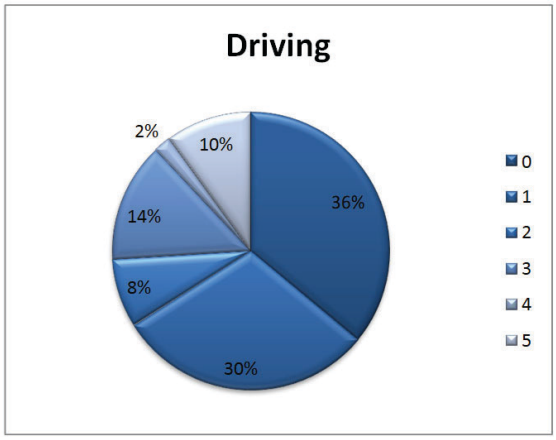

Chart 10

Table 11: Effects of Neck Pain on Sleeping:

Score	%
0	53%
1	18%
2	9%
3	14%
4	4%
5	2%

From the above study, we can say that:

- 53% People have no trouble sleeping (0)
- 18% People sleep is slightly disturbed (less than 1 hour sleepless). (1)
- 9% People sleep is mildly disturbed (1-2 hours sleepless). (2)
- 14% People sleep is moderately disturbed (2-3 hours sleepless). (3)
- 4% People sleep is greatly disturbed (3-5 hours sleepless). (4)
- 2% People sleep is completely disturbed (5-7 hours sleepless). (5)

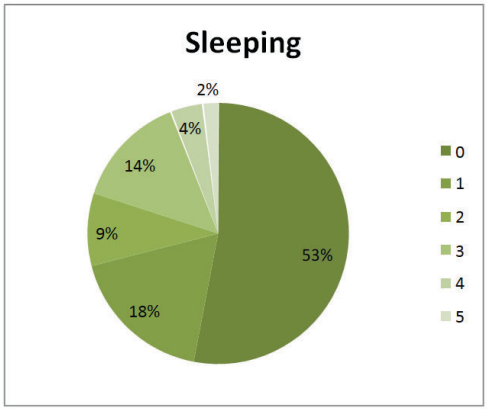

Chart 11

Table 12: Effects of Neck Pain on Recreation:

Score	%
0	50%
1	18%
2	13%
3	15%
4	1%
5	3%

From the above study, we can say that:

- 50% People are able to engage in all recreation activities with no neck pain at all(0)
- 18% People are able to engage in all their recreation activities with some pain in the neck(1)
- 13% People are able to engage in most but not all of their usual recreation activities because of pain in their neck(2)
- 15% People able engage in a few of usual recreational activities because of pain in neck. (3)
- 1% People can hardly do any recreational activities because of pain in neck. (4)
- 3% People cannot do any recreational activities all. (5)

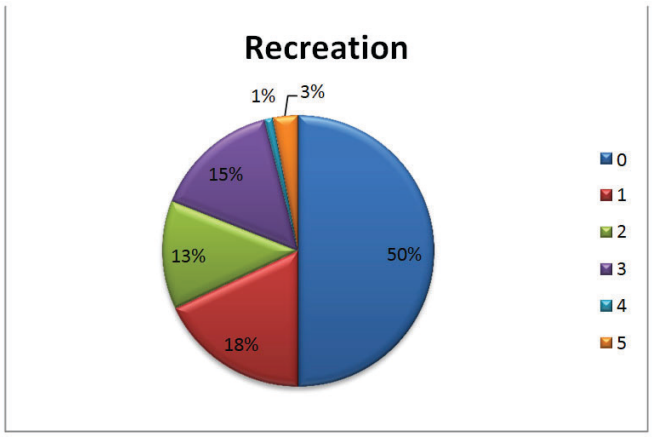

Chart 12

DISCUSSION

The study was carried out to assess the prevalence of neck pain in 20 – 50 years age group. The questionnaire used was neck disability index.

Scores:

- 0 to 4 indicates – no disabilities
- 5 to 14 indicates – mild disabilities
- 15 to 24 indicates – moderate disabilities
- 25 to 34 indicates – severe disabilities
- > 35 indicates – complete disabilities

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. In neck pain studies there are different points and assessment measures for prevalence. So, to compare the results the different points in time and the population studied must be taken into account. Although self-reporting is usually considered a less reliable way to measure disease outcomes, neck pain is a mainly a self-reported condition.

According to Siivola SM, levoska S, Latvala K, Keinanen – Kiukaanniemi S (2004) concluded that in young adult the incidence of neck and shoulder pain is high.[15] from present study, we can say that 18 % of People have mild neck pain.

According to Van Der Heuvel SG, Heinrich J, Jans MP, Van Der Beek AJ, Bongers PM (2003) concluded that sustained sporting activities have a favorable effect on neck / shoulder symptoms.[29] from present study; we can say 18% People are able to engage in all their recreation activities with some pain in the neck.

According to L. Smith, Q Louw, L Crous & K Grimmer – Somers concluded that headaches and neck pain are reported to be among the most prevalent musculoskeletal complaints in general people. The significant body of research has reported a high prevalence of headache and neck pain among adolescents.[30] From present study, we can say that 29 % of People have slight headache that come infrequently.

According to Diepenmaat AC, Van Der Wal MF, De Vet He, Hirasing RA (2001) found that musculoskeletal pain is common among adolescents and is associated with depression and stress.[18] From present study we can say that 29 % of people can concentrate fully when they want with slight difficulty.

Arie NS et al.[26] 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.

LIMITATIONS AND FUTURE SCOPE OF STUDY

Limitation:

The study is limited to Surat City only .The study is limited to the Computer Operators of Surat City who are using conventional computers with desktops. The study is limited to 100 subjects for questionnaire based variables.

Future Scope of Study:

A future study with large sample size from different areas of the country; both urban and rural can be done. Modifiable and non-modifiable risk factors can be analysed and strategies can be derived for modifiable factors to reoccurrence of neck pain.

CONCLUSION

From the study we can say that:

- 32% have no disability, 25% have mild disability, 30% have moderate disability, and 12% have severe disability.

Therefore, we can conclude that 55 % of the people of age group 20 to 30 years have mild and moderate neck pain.

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