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"PREVALENCE OF SMS THUMB AMONG TEENAGERS WHO USE SMARTPHONES: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background:

Physical exposure during mobile phone use results repetitive movement of thumb and hand causes multiple symptoms. The term SMS Thumb is most common among them. Aim is to find out the prevalence rate of SMS Thumb among smartphone users in school going students

Methodology:

A cross sectional study was conducted by convenient sampling technique. A total 300 participants who is school going students both boys and girls at age group of 13-18 years using a smartphone minimum 1 hourper day. Participants were asked to fill a Proforma containing Cornell Hand Discomfort Questionnaire (CHDQ) & Numerical Pain Rating Scale (NPRS).

Result:

It is shown that there is 28% prevalence of SMS thumb pain is shown among teenagers who use smartphones.

Conclusion:

The prevalence rate of SMS thumb among smartphone users in teenagers has been established in this study. Musculoskeletal problems may be short term initially but can develop into long term disabilities if proper caution is not taken.

Keywords:

Pain, Smartphone, SMS Thumb

INTRODUCTION

A Smartphone is the most popular gadget among the adolescent population nowadays foe sharing information, using the internet, watching videos, using social media, gaming and many other daily activities. (1)

There is a relation between mobile design and anthropometry of the user in causing discomfort and fatigue in hand, elbow and shoulder while using the hand-held device (HHD).(2) Type of Posture(sitting or standing) and the type of mobile phone task (holding the phone versus texting)have an effect on muscles activity and thumb positions. The thumb is placed in abductionand flexion during texting compared to adduction and extension when making phone calls with its range of moment differing according to the size of the phone and orientation of the keys. Females compared to males had higher muscle activity in extensor digitorium muscle and the abductor policies longus muscle when entering SMS messages and tended to have greater thumb abduction, higher thumb movement velocities and fewer pauses in thumb movements. (3) Long-term repetitive movements of the thumb and fingers are the main identified risk factor for disorder of thumb and its musculature. (1)

This has led to coining of various phrasesto describe musculoskeletal disorders due to use of mobile phones such as "SMS Thumb", "iPod finger", "blackberry thumb" etc. [4][5]

Continuous repetitive movements with the thumb and fingers may lead to disorders of the thumb and its musculature like tendinosis of the extensor pollicislongus or myofacial pain syndrome in the hand. [6]

The term "Text neck syndrome" was first coined by Dr. Dean L. Fishman as an overuse injury.The injury may be due to poor posture because, during smartphone use, the neck goes into forward flexion and the normal curvature of the cervical spine is flattened and stretched on theneck musculature. The poor posture of the head and neck has been correlated with chronic musculoskeletal pain of the cervical spine and upper back, tightness, and spasm in the upper extremity muscles.

Several studies have reported a significant increase in the number of adolescent smartphones. Users and its association with musculoskeletal discomfort in recent years, which is becoming agrowing problem and has large impact globally.

NEED OF STUDY

SMS Thumb is associated with restricted movement of thumb and fingers most commonly seen in teenagers who uses smart phones for very long time. This study is to find out the prevalence of SMS thumb among teenage students who use smart phones.

AIM

- Aim of study was to find out the prevalence rate of SMS Thumb among smartphone users incollege going students.

OBJECTIVE

- To assess Pain and Discomfort using NPRS scale in teenagers who use smart phones.
- To assess Pain and Discomfort using Cornell Hand Discomfort Questionnairein teenagers who usesmart phones.

HYPOTHESIS

1) NULL HYPOTHESIS

There will be no significant relation of SMS Thumb among teenagers who usesmartphone very long time.

2) EXPERIMENTAL HYPOTHESIS

There will be significant relation of SMS Thumb among teenagers who use smartphonevery long time.

METHODOLOGY

- Study Design: Cross Sectional Study
- Source of Data: Schools of Ahmedabad
- Population - students of Age 13-18 years
- Sampling Method - Convenient Sampling
- Sample Size - 300 subjects
- Duration of the Study - 1 years

Materials and Tools Used:

- Numerical Pain Rating Scale
- Cornell Hand Discomfort Questionnaire
- Pen

- Pencil
- Rubber
- Scale

Inclusion Criteria:

- School - going students
- Age 13 - 18 years
- Using smart phone for a period minimum 1 year
- Minimum duration of smart phone use of ≥1 hour per day
- Able to understand and fill in the questionnaire in English
- Willing to participate in the study.

Exclusion Criteria:

- Any known condition which could lead to pain in the upper limb
- Any traumatic injury to the upper limb.
- History of hand surgery
- Neurological problems of upper limb

Outcome Measures:

1.Numerical Pain Rating Seale (NPRS): The NPRS is an 11- point scale consisting of integers from 0 through10; 0 representing "NoPain" and 10 representing "Worst imaginable pain". Respondents select the single number that best represents their pain intensity.

2.Cornell hand discomfort questionnaire (CHDQ): It is a 6-item questionnaire containing a hand map diagram showing 6 shaded areas of thehand and questions about

1. Prevalence of Musculoskeletal pain,
2. Discomfort,
3. Interference with work, during the previous week.

Total discomfort score will be calculated by using the following formula: Frequency x discomfort x interference, where higher the score indicated more discomfort. Maximumscoring for each are is 90, and the total scoring for 6 areas is 560.

Procedure:

- Participants were recruited from various schools in Ahmedabad, Gujarat.
- Study participates will be recruited according to their academic year (8th - 12th), andan equal percentage will be obtained from each class, Boys and girls will be divided equality among the academic year groups.
- The nature and purpose the study will be explained by the researcher and informedconsent will be taken from the participants.
- A structured questionnaire containing Demographics (Name, Age, Gender, Height, Weight & duration of smartphone use), Numerical Pain Rating Scales(NPRS), Cornell Hand Discomfort Questionnaires (CHDQ) will be used to collect thedata.

RESULT

In present Study 300 participants with 13 -18 years were selected and divided in five groups.300individuals have been filled a proforma digitally.

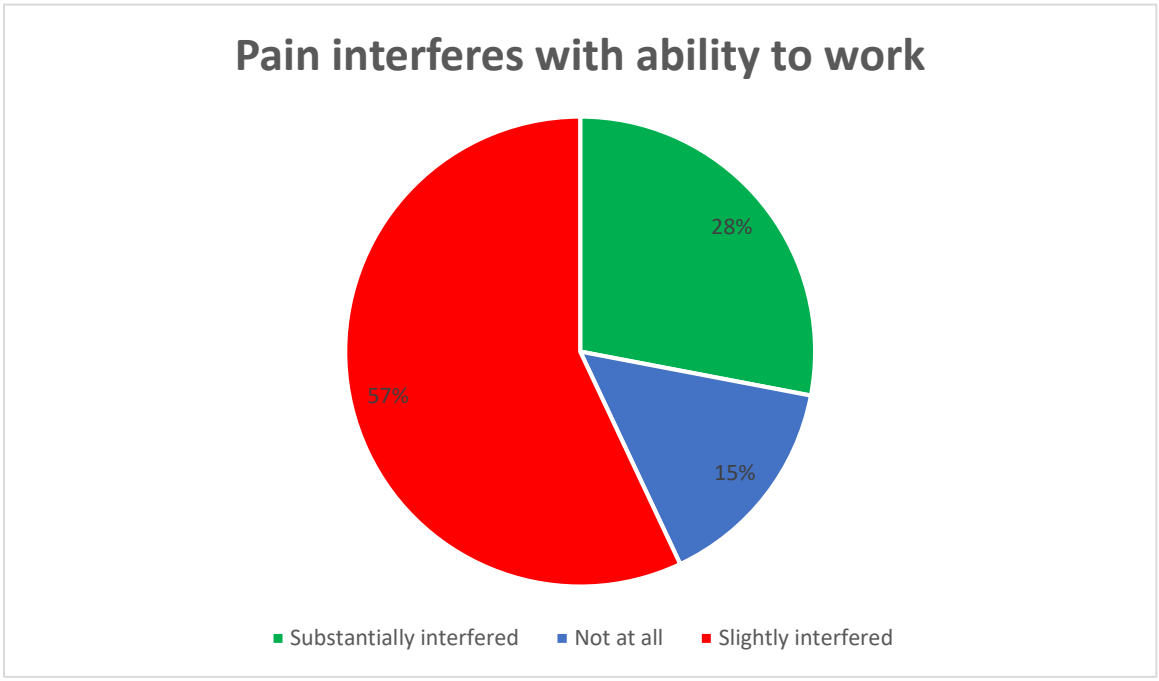

Figure 1: Pain interferes with ability to work

As per the figure 1, 15% subjects have no pain that interferes with their ability to work. 57% were slightly interference and 28% have substantially interference with ability to wok. Among them 57% have slight discomfortness, 27% have moderately uncomfortnesss and 15% have very uncomfortnessdue to pain while using smartphone. This shows that 85% subjects have some affection due to use ofsmartphones.

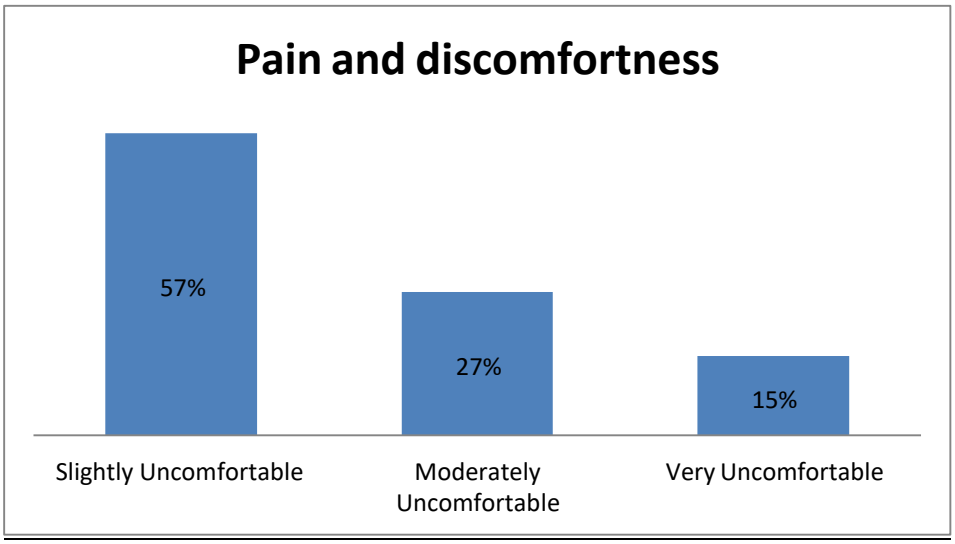

Figure 2: Pain and discomfortness

Among the population affected 5% have pain experienced several times per day, 11% have affection onceevery day, 21% have 3-4 times per week , 54% have 1-2 times per day and 9% have experienced no pain.

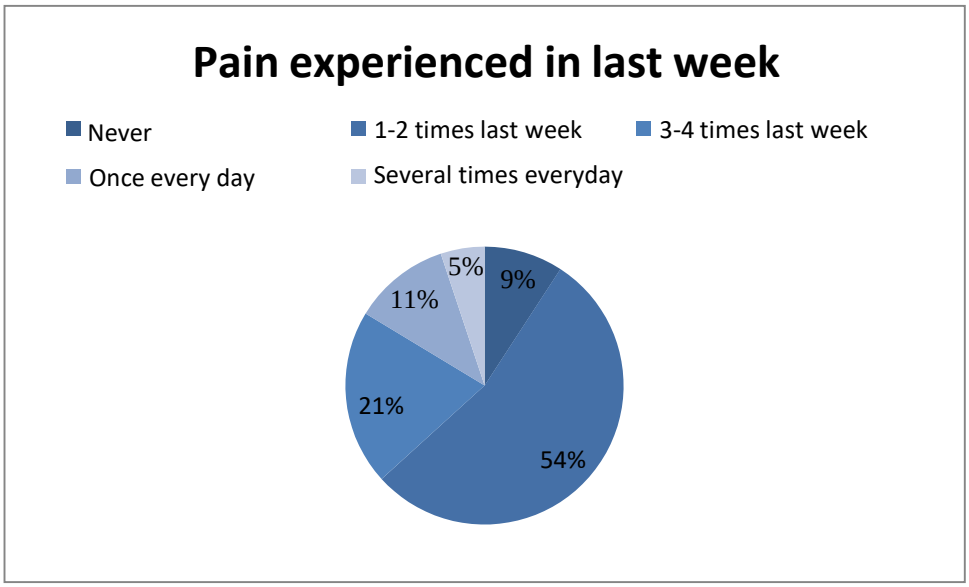

Figure 3: Pain experienced in last week

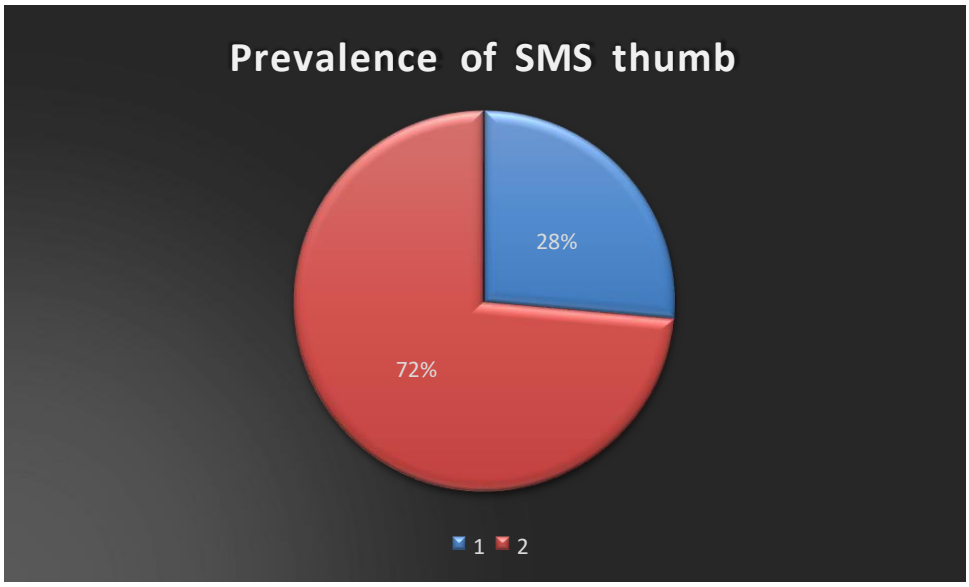

Figure 4: Prevalence of SMS Thumb

So, it is concluded that 28% population is affected by SMS thumb and it is shown in figure 6. 72%population is remained unaffected.

DISCUSSION

In this study, the prevalence of SMS Thumb among teenagers who use smartphone was reported. During message typing, the thumb and palm muscles are used extensively. Sustained gripping and repetitive movements of the fingers and thumb are main key factor that might lead to the associated syndrome.

For texting, the thumb is adducted on the key pad of mobile device and high force is used to type. Studies reported that tendonitis in extensor pollicis longus, adductor pollicis, wrist tendonitis, and deQuervain's syndrome are associated with text messaging. Excessive texting might also lead to carpometacarpal joint arthritis.

Various factor affect the cause of SMS thumb. The contributing factors might be the small spacing on keyboard, mobile size, phone keypad, posture of thumb, etc. the static loading during text messaging on a hand-held device for a long duration can be hazardous for the body posture and overuse of the hand muscle, which might lead to pain in the hand, forearm, neck and upper back muscles.

Long durations of use of mobile phones could adversely affect the musculoskeletal system of hand. Long durations off computer use might increase the risk of neck and shoulder pain.

Text neck syndrome and SMS thumb are repetitive stress injuries that could be prevented by taking some preventive measures and controlling the use of smart phones. Simple life style changes like maintaining correct posture during smart phone use and avoiding long-term use of smart phones could prevent the development of neck pain and SMS thumb.

This study would be helpful to inform smart phone users about the alarming rise of negative consequences of smart phone addiction and long-term smart phone use.

The various biases of this cross-sectional survey, such as selection bias, non-response bias and ascertainment bias, were eliminated by using some strategies as follows. By using pre-fixed inclusion and exclusion criteria, the ascertainment bias was eliminated. Selection bias and non-response bias were eliminated by using a random sampling method. The sample size used in this study was small.

CONCLUSION

The prevalence rate of SMS thumb among smartphone users in teenagers has been established in this study. It is shown that there is 28% prevalence of SMS thumb pain is shown among teenagers who use smartphones. The musculoskeletal problems may be short term initially but can develop into long term disabilities if proper caution is not taken.

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