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ORIGINAL ARTICLE

Prevalence of de Quervain's tenosynovitis among smartphone users due to text messages in undergraduate students of Gujranwala.

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ABSTRACT… Objective: To assess the prevalence of De Quervain's tensosynovitis among smart phone users caused by excessive text messaging in undergraduate students of Gujranwala. **Study Design:** Cross Sectional study. **Setting:** Data was collected from different Institutes of Gujranwala City in the Institutes i.e. Elite College Gujranwala, Gujranwala Institute of Medical Sciences, Gujranwala Medical College, and Degree College Gujranwala. **Period:** 01-01-2022 to 30-06-2022. **Methods:** Institutes were selected by convenience sampling technique. 8 male and 12 female institutes were selected. The sample size at the time of study were 300. In this investigation, non-probability convenience sampling technique was used. **Results:** Results show that youngsters using smartphone frequently showed more positive result for Dequervain tenosynovitis (Finkelstein test p-value < 0.05). **Conclusion:** De Quervain's tenosynovitis is most prevalent among females. People with the age group of 20-21 are most effected as compared to the other age groups. Because of their repetitive usage of smartphone experiencing ache and weakness over the base of pollex or wrist. There seems to be a direct link among heavy text communications on a smartphone and prevalence of Dequervain tenosynovitis.

Key words: Dequervain Disease, Finkelstein's Test, Smartphone Users, Tenosynovitis, Text Messages.

INTRODUCTION

De Quervain's tenosynovitis (DQT) is a painful inflammatory condition of the thumb and wrist. It is a common wrist pathology. In De Quervain's pain occur due to entanglement of Abductor Pollicis Longus (APL) and Extensor Pollicis Brevis (EPB) tendons in the fibro-osseus canal. It is pain in wrist caused by stenosing tenosynovitis of thumb abductors around radio styloid process. It is inflammation of the sheath around the tendons of thumb abductors. Pain is felt in the first dorsal compartment over the radial styloid process. The patients may experience symptoms like pain, numbness spasm, tingling and burning. With the inventive work-related and proficient requests, the frequency of this illness is also expanding slowly. This painful condition is a consequence of those activities which involve repeated thumb pinching and wrist movement.[1]

In DQT, the main muscles that are affecting our wrist and hand are abductor pollicis longus and extensor pollicis brevis. The abductor pollicis longus muscle is comprised of two heads. It is originated from one is superficial and the other one is deep. Both divisions are terminating into more than one tendon. The superficial tendon is situated more distally and not covered by any other muscle. The fibers of superficial division of APL are thin and are arranged in parallel fashion to each other. The superficial tendons run along with deep tendons of APL and passes from the extensor retinaculum and insert. At the level of first metacarpal, the deep fibers of APL are situated below extensor digitorum muscle. The fibers arranged in a pennate manner and are shorter than superficial fibers. After passing through extensor retinaculum the deep tendons are divided into many branches. The insertion of both fibers occurs at the base of first metacarpal bone trapezium. Main physiological movement by APL are wrist extension, thumb extension and

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abduction. The second muscle extensor pollicis brevis is originate from lateral surface of lower third of radius and interosseus membrane and distal to the attachment of abductor pollicis longus. The main function of this muscle is the extension of thumb. At the level of carpometacarpal joint as well as Metacarpophalangeal joint. The tendon of EPB after passing under the extensor retinaculum get inserted at the phalanx of the thumb on the posterior surface.[2]

De Quervain's tenosynovitis associated with repetitive strain injury. It's an occupational disease in which increased work load demand required repetitive movement at wrist causing symptom of repetitive strain injury: Phone operators are at excessive danger of emerging this condition. People are continuously using Mobile phone both for their work demand as well as for entertainment purposes. Now a day's smart phones are used for texting. People continue to swipe and press on Smart phone during text messages that's cause soft tissue injury. Somehow any underlying pathology may be present but, in most cases, only repetitive wrist fingers or thumb movement associated with symptoms of dequervain tenosynovitis. Inflammation of underlying structure occur due to repetitive use. Smart phone users experience pain due to heavy text messages on radial side of the wrist. When we are using Smart phone excessively for texting it causes inflammation of two tendon which are Abductor pollicis longus and extensor pollicis brevis lies on side of wrist. These two muscles are performing the action of wrist and thumb abduction and extension. As a result, producing the symptoms of dequervain tenosynovitis that are pain, swelling, tenderness on touch, weak grip strength weakness in wrist and hand especially the radial side.[3]

METHODS

It was a cross-sectional study design in which a Patient Rated Wrist Evaluation (PRWE) and Smart Phone Addiction questionnaire was used to collect the data.

The study was conducted among students in Gujranwala City in the Institutes i.e. Elite College Gujranwala, Gujranwala institute of medical sciences, Gujranwala Medical College, and degree college Gujranwala from 01.01.2022 to 30.06.2022.

A total of 300[1] individuals (140 males and 160 females) were chosen through non-probability convenience sampling technique. Only individuals who agreed to take part in this study were given the questionnaire.

It was taken from the IRB of Government College University Faisalabad with study number 19688 with IRB number 688 as the concerned college is affiliated with GCUF.

Inclusion Criteria

Students that were between 17 to 23 years old and having no previous upper limb injury were included in the study.

Exclusion Criteria

Students who had previously any joint disease of thumb like osteoarthritis of thumb, sports like golf and tennis, household activity, weightlifting or muscle strain causing any physical limitations were excluded.

After getting the acceptance of sample size and keeping in view the exclusion and inclusion criteria of the study, Participants Valued Wrist/Hand Assessment Questionnaire, Phone Habit Scale-Short Scale and Finkelstein test were selected as a data collection tool. The questionnaire fulfilled all of the criteria and circumstances pertaining to the research issue. Questionnaire comprised of two parts. Demographic data that was necessary for the study was collected in that portion while health related questions were asked in second part of the questionnaire.

This was a survey-based study by using non probability convenient sampling after getting exclusion and inclusion criteria satisfied. The sample size of 300[1] members was interviewed through a Patient Rated Wrist/Hand Evaluation Questionnaire to collect data. Before the data was collected, participants were informed about the study's goal and advantages. The supervisor has

to authorize it, before using the questionnaire for research. This study didn't force any participant to fill the questionnaire and all the personal information was kept confidential. The selection of respondents was done without any favoritism. The study ensured the obscurity of participants. The study's main goal was to determine the prevalence of impact of smartphone usage on student's quality of life.

The data were analyzed by using SPSS (Statistical Package for Social Sciences) version 20. The frequency distribution of a descriptive study was used to check the occurrence of each response. After calculating frequency distribution, cross-tabulation was used to create the bi-variate relationships. Cross Tabulation is used to find the inter-relationship between variables. For simple and easy data entry into SPSS version 20 software, information of the variables is converted into numerical coding after completing data collection so that it can be easy for application of analysis of data and statistical tests to find out the significance of the research.

RESULTS

Male and female subjects participated in studies were 140 and 160 respectively. All of them were frequently using smartphone for texting. Of three hundred pupils who filled the questionnaire 235 were suffering pain in wrist and pollex.

This table demonstrates the classification of subjects based on demographic data. It indicates that out of 300 subjects 39.0 % subjects are in group of 17-19 years. 39.0% subjects are in group of 20- 21 years. 22.0 % subjects are in group of 22-23 years. out of 300 subjects 53.3% subjects are female, 46.3%subjects are male. out of 300 subjects. 96.0 % subjects have no pain. 3.0% subjects have mild pain. 0.7% subjects have moderate pain. 0.3 % subjects have worst pain. This table demonstrates the subjects experiencing pain at repeated movement. It indicates that out of 300 subjects. 6.0 % subjects have no pain. 39.3% subjects have mild pain. 35.0% subjects have moderate pain. 19.7 % subjects have worst pain. This table demonstrates the subjects experiencing pain when lifting a heavy object. It indicates that out of 300 subjects. 5.7 % subjects have no pain. 36.7% subjects have mild pain. 39.3% subjects have moderate pain. 18.0 % subjects have worst pain.

			Frequency	Percent
Valid	Age	17-19	117	39.0
		20-21	117	39.0
		22-23	66	22.0
	Gender	Male	160	53.3
		Female	139	46.3
		total	299	99.7
	Pain at rest	no pain	288	96.0
		mild pain	9	3.0
		moderate pain	2	.7
		worst pain	1	.3
		Total	300	100.0
	Pain with repeated movement	no pain	18	6.0
		mild pain	118	39.3
		moderate pain	105	35.0
		worst pain	59	19.7
		Total	300	100.0
	Pain when lifting heavy objects	no pain	17	5.7
		mild pain	110	36.7
		moderate pain	118	39.3
		worst pain	55	18.0
		Total	300	.3

Table-I. Frequency distribution based on demographic data

Test was performed on the undergraduates about 78.3% presented encouraging result. It was found that incidence of smartphone practice has been amplified among youngsters. It showed more positive result for Dequervain tenosynovitis (Finkelstein test p value < 0.05).

Results	Frequency	Percentage
Negative	65	21.7
Positive	235	78.3
Total	300	100.0

Table-II. Response distribution of Finkelstein Test

DISCUSSION

The aim of this research was to show the incidence of De Quervain's tendinous synovitis among Smart phone users. Younger peer groups having male access to latest Technology and communication equipment including mobile phone, tablets, smart gadgets computers. They are basically using these for information, study purpose, SMS texting for recreational purpose.

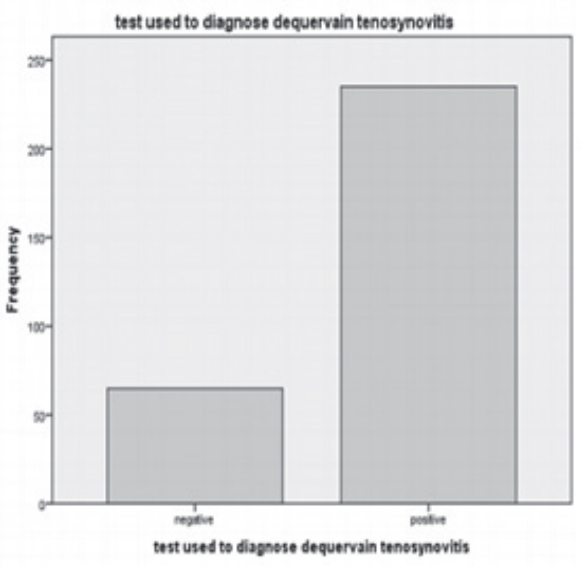

Figure-1. Response distribution of Finkelstein Test

Its use has been widely increased from past decade but the usage was heavily increased in covid19 period.[1] De Quervain's tenosynovitis which effect the wrist and hand dexterity and limitation of movement. As in current study people between the age of 17 - 23 are included as De Quervain's tenosynovitis is more prevalent in this age. Another study showing that mean age of subject suffering from thumb pain are 18 - 25 years old and all of them were right-handed and mobile phone users. There is association between our age group and this study age group.[4]

The key goal of this research was to show the occurrence of De Quervain's tenosynovitis among mobile phone users. From the last few years, smart mobiles have developed a significant portion of our existence. The percentage of smart phone users are constantly increasing day by day. Nowadays, most of individuals could not spend a solo day lacking their cellphone. About more than 51% of adolescence and fathers feel that they are using to smartphones. Due to its repetitive usage, the mobile phone users are suffering from wrist pain, named as dequervain tenosynovitis. The reason of De Quervain's tenosynovitis in youth is repetitive use of the pollex in quick messaging facility texting, calling someone, writing, computer users as when holding mouse or use keyboard while typing, grasping of objects for a prolonged period of time. Smart phones are widely used in covid19 pandemic, all around the world's population. De Quervain's tenosynovitis effects the proper functioning of wrist due to causing wrist pain. A previous study showing the commonness ratio of Dequervain tenosynovitis was additional common in mean age group range from 20-22 years old. There is association between our age group and this study age group.[5] Another study showing that Mean age of subject suffering De Quervain's tenosynovitis from 18-25 years old and all of them are smart phone users. There is association between our age and the previous study age.[6]

According to literature review De Quervain's tenosynovitis affect the both genders. But the prevalence ratio of this disease is higher in female than male gender. Due to a lot of reasons including lifestyle, working in awkward wrist position, poor baby lifting technique, pregnancy, estrogen deficiency due to menopause, overuse of thumb, arthritis. As in our current study the no. of female subject were higher than male 53% female 46% male. A previous study conducted that also shows the same result having female ratio more than that of female the ratio was 1:4.[1] Another study showing that no. of male in the study were 40 as compared to female that were 138.[7] A study was conducted that showing age and gender does not influenced on the De Quervain's tenosynovitis. It is occurred with an equal ratio of gender involvement. A study among bank employer was Showed male including in study were 60% while the female was 40%. It is showing there is no Association between pain and gender.[8] A study that was conducted in texting with touchscreen and keypad phone their effect on upper limb especially thumb kinematics and kinetics. The ratio of male to female was showing that the females were significantly dominant in study in comparison to male gender. All the participants where daily smart phone users.[9] A study was conducted that show Problematic smartphone use is cause of De Quervain's tenosynovitis the majority of population among study were female 52%. In study in comparison to male that were 48%.[6] Another study showing that number of male in the study were 146 as compare

to female that were 192.[10] A study was conducted in computer users with an equivalent ratio of gender involvement. This showed male including in study were 50.3% and female was 49.7%. It is showing there is no association between pain and gender.[11]

To determine the frequency of wrist among smartphone users was confirmed by performing Finkelstein test. Finkelstein test was performed on the participants to find out the frequency of wrist pain among smartphone users. A study was conducted showing that number of subjects was 384 from which 223 students Showed positive Finkelstein test.[12] A study showing positive results who were experiencing wrist pain was 58.5%.[13] The research was Shown between school children, the total number of students was 700 from 412 were experiencing pain in wrist and thumb on Finkelstein test.[14]

CONCLUSION

The findings of the research concluded that most of the students are phone users and used their mobile phone for heavy texting. De Quervain's tenosynovitis is most prevalent among females. People with the age group of 20-21 are most effected as compared to the other age groups. Because of Their repetitive usage of smartphone experiencing ache and weakness over the base of pollex or wrist. There seems to be a direct link among heavy text communications on a smartphone and prevalence of De Quervain's tenosynovitis.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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2	Abid Rashid	Data collection.	
3	Aneeqa Waheed	Proof reading.	
4	Namra Khaliq	Article write up.	
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6	Imran Rafiq	Literature review.	
7	Wajeeha Amjad	References proof read.	