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Original Article

Prevalence of De Quervain's Tenosynovitis and its Association with Mobile Texting among the University Students

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ABSTRACT

De Quervain tenosynovitis of the wrist is a tightening or compression along with the inflammation of the 1st dorsal compartment. **Objectives:** To determine the magnitude of De Quervain's Tenosynovitis, functional disability and pain association with Mobile Texting among the students of The University of Lahore. **Methods**: A non-probability convenience sampling strategy was used to conduct a cross-sectional research among 191 individuals from the University of Lahore. The data was obtained using the Standardized Michigan Hand Outcomes Questionnaire after informed written agreement. The Numeric Pain Rating Scale (NPRS) was used and Finkelstein's test was performed. The data was analyzed using the SPSS. For categorical data, frequency and percent-ages were used, and the chi-square test to find the relation between the variables. P-value of <0.05 was considered significant. Both male and female patients who matched the inclusion criterion of being between the ages of 22 and 32 were taken in study. **Results:** Out of 191 university students, 100 (52.4%) were male and 91(47.6%) were female, the age was 27 ± 0.32, dominant hand of 177 (92.67%) was right and 14 (7.33%) were left-handed. There was a positive association among Finkelstein's test and Michigan hand questionnaire (MHQ) as p < 0.001 as well as Numeric Pain Rating Scale (NPRS) and Michigan hand questionnaire (MHQ) as p<0.001. **Conclusions:** The study discovered that nearly significant proportion of the student's text on their phones, and that as a consequence of their mobile phones usage and extreme texting speed and they experience De Quervain's. There is an affirmative correlation between frequent text messaging and thumb pain.

INTRODUCTION

De Quervain tenosynovitis of the wrist is a tightening or compression along with the inflammation of the 1st dorsal compartment. It usually starts with a sudden outbreak of pain that is badly intensified through gripping, bringing the thumb away from the palm, and ulnar dislocation of the wrist [1]. Abductor pollicis longus along with the extensor pollicis brevis are complicated in De Quervain's tenosynovitis syndrome [2]. Although the De Quervain tenosynovitis syndrome's specific origin is unknown. The myxoid degeneration along with the fibrous tissue deposits and increased vascularity are linked with De Quervain tenosynovitis rather than acute synovial lining soreness [3]. Patients with this ailment often experience pain on the side of the distal radius bone, which aggravates on thumb deviation on the ulnar side, a powerful grip collective with the wrist flexion along with radial deviation or a hard squeezing together of the index finger and thumb. Soreness and edema are found right above the first dorsal compartment on physical examination [4]. There is evidence that certain everyday activities may raise the chance of developing DQT. The tendons get inflamed or the extensor retinaculum swells as a result of these repetitive strains. Frequent stresses and dwindling of the tendons can create roughness and irritation that leads to tendon canal tightness [5]. The particular origin of De Quervain's tenosynovitis is revealed through a study of the literature. De Quervain tenosynovitis has no knowing cause as it appears by repeated stresses over the wrist and thumb in

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various activities of daily life that leads to De Quervain tenosynovitis [6]. De Quervain tenosynovitis can cause a lot of pain and make it difficult to do simple things like turn the keys or button one's shirt [7]. The predicted De Quervain tenosynovitis prevalence is 0.5% and 1.3%, respectively, for men and women [8]. The expanding user base cellphones and computers significantly increase the prevalence of De Quervain tenosynovitis [9]. Overuse of the thumb muscle during hand movements, such as prolonged writing, frequent texting, and other overuse disorders, can raise the risk of de Quervain illness [10]. De Quervain tenosynovitis' exact cause is still unknown, but a number of potential causes have been put forth, including blunt trauma, biomechanical compression, overexertion from repetitive work activities, anatomical variations or abnormalities, genetic predisposition, cold temperatures, and, very rarely, pathogens [11]. Nowadays the prolonged use of cell phones for messaging, net surfing, and working purposes is causing evident clinical changes in the muscles and strength of the thumb [12]. The university students are spending most of their time every day texting, emailing, scheduling, and net surfing on their cell phones that are causing pain at the base of their thumbs which leads to the de Quervain tenosynovitis pathology [13]

METHODS

A cross-sectional survey of undergraduate students was undertaken that were studying at the University of Lahore. The size of the sample was 191 which was computed by using the formulae the value of the sample size n= [DEFF*Np(1-p)] / [d^2/Z ^{2} 1-α/2* (N-1) +p*(1-p)] [2]. The estimated proportion was taken at 0.42, the desired precision of the estimate was 0.07 and the confidence level was taken at 95 percent. It was a Non-Probability Sampling Technique. The data was collected by a standardized questionnaire. The questionnaires were filled with face-to-face interview techniques. Proper Guidance regarding the filling of the questionnaires was given to all the participants, and they were instructed to fill every item and express their honest responses as well. In a sitting posture with their forearm on the table, the examiner applied mild ulnar deviation to help gravity in creating tension in the first dorsal compartment, then distracted the thumb distally. Patients who met the inclusion criteria of having age between 22 years to 32 years, both male and female gender, numbers of hours using the cell phone per day ≥ 6 hours, the mobile phone having hard touch like Vivo & Realme were included in the study. Those who were not willingly providing accurate data or had any past surgical history of the wrist were excluded. Before the poll was performed at the university, the institution's officials signed a written consent form. The data were obtained using the Standardized Michigan Hand Outcomes Questionnaire after receiving informed written consent (MHQ). The data was analysed using the Statistical Package for Social Sciences (SPSS) for Windows. For categorical data, frequency and percent-ages were used. The Chi-square test and the Finkelstein test were used to examine the relationship between the variables. It was determined that a P-value of 0.05 was significant.

RESULTS

Out of 191 university students, 100 (52.4%) were males and 91 (47.6%) were females. The majority of the students were undergraduate and in five-year programs. Out of 191 university students, the age 169 (88.5%) was 22-26 years and 22 (11.5%) were 27-32 years. The dominant hand of 177 (92.67%) was right and 14 (7.33%) were left-handed and BMI of 81 (42.41%) was normal, 53 (27.75%) were overweight, 19 (9.95%) were in obese class I, 4 (2.9%) in obese class II and only 5 (2.62%) were underweight. The results showed in the study that out of 191 students dominant hand of 177 (92.67%) was right and 14 (7.33%) were left-handed. And 25 (13.1%) who had positive Finkelstein's test, 152 (79.58%) were right-handed. According to our research, there was no significant association between the Dominant and Finkelsteins test as the p-value was 0.589 which is > 0.05. According to a current study out of 191 university students, 166 (86.9%) had a negative Finkelstein's test and those who have positive test were suffering from pain 76 (39.8%) of them had mild pain, 73 (38.2%) had moderate, 4 (2.1%) had severe and 38 (19.9%) had no pain. As shown in table 1 Finkelstein did not show an association with age, gender and hand dominance.

Age	27 ± 0.32
BMI	20.5 ± 1.07
Gender	Male = 100(52.4%)
	Female = 91(47.6%)
Finkelsteins test	Positive = 25(13.1%)
	Negative = 166(86.9%)
Dominant Hand	Right hand =177(92.7%)
	Left hand=14(7.3%)

Table 1: Age, gender, BMI, dominant hand, and Finkelsteins Test

According to our current study that the mean of Michigan Hand Questionnaire (MHQ) among university students was 43.08 ± 11.48 (min 14 and max 63) and 76 (39.8%) of them had mild pain, 73 (38.2%) had moderate, 4 (2.1%) had severe and 38 (19.9%) had no pain (Table 2).

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Correlations				
			Numeric Pain Rating Scale	Michigan Hand Questionnaire
Spearman's rho	Numeric Pain Rating Scale	Correlation Coefficient	1.000	.532
		Sig. (2-tailed)	-	.036
		N	191	191
	Michigan Hand Questionnaire	Correlation Coefficient	.532	1.000
		Sig. (2-tailed)	.036	-
		N	191	191

Table 2: Association between Finkelsteins test and Michigan Hand questionnaire (MHQ)

There was a significant positive correlation between finkelsteins test and Michigan hand questionnaire (MHQ) as rs(189)= .277, p <. .001 as shown in table 2 above.

Whereas there was a significant positive correlation between Numeric Pain Rating Scale (NPRS) and Michigan hand questionnaire (MHQ) as rs (189) = .532, p <. 001 as represented in Table 3.

Correlations				
			Finkelsteins Test	Michigan Hand Questionnaire
Spearman's rho	Finkelsteins Test	Correlation Coefficient	1.000	.277
		Sig. (2-tailed)	-	.007
		N	191	191
	Michigan Hand Questionnaire	Correlation Coefficient	.277	1.000
		Sig. (2-tailed)	.007	-
		N	191	191

Table 3: Association between Numeric Pain Rating Scale and Michigan Hand questionnaire

DISCUSSION

The study aimed to find out the prevalence of De Quervain's tenosynovitis and its association with mobile texting among the students of the University of Lahore. Michigan Hand Questionnaire, Numeric rating scale for pain, and Finkelsteins test were used in the study. Data from the students of the University of Lahore who fulfilled the criteria were collected regarding De Quervain's tenosynovitis and how it relates with the mobile text. Out of 191 university students, 100 (52.4%) were males and 91 (47.6%) were females. Out of 191 university students, the age 169 (88.5%) was 22-26years and 22 (11.5%) was 27-to and 32 years. Dominant hand of 177 (92.67%) was right and 14 (7.33%) were left-handed. And BMI of 81 (42.41%) was normal, 53 (27.75%) were overweight, 19 (9.95%) were in obese group I, 4 (2.9%) in obese group II and only 5 (2.62%) were underweight. Ashurst et al., conducted a study to know that whether the tenosynovitis can be caused by frequently texting in which he concluded that bilateral de Quervain tenosynovitis is due to excessive texting by the patient on her mobile phone. When compared to the left hand and mutual relationship, clinical estimate found that the right hand was more usually engaged (92%).The common symptoms described by the members during the assessment were pain in the thumb, pain in resisted thumb extension, restriction of thumb movement, and pain while compressing the area. The results of the study show that out of 191 students dominant hands of 177 (92.67%) were right and 14 (7.33%) were left-handed. And out of 83 (43%) who had positive finkelsteins test 78 were right-handed. According to our research in contrast to Ashurst et al., there was no significant association between the Dominant and Finkelsteins test as the p-value was 0.589 which is > 0.05.30 [14]. Ma et al., concluded out of total of 246 students (49%) had Finkelstein's test positive, according to their findings. In our research, we discovered that the Finkelstein test yielded a favorable result (67%, n = 238) for the students who took part. Most of the individuals suffering from thumb pain had a positive Finkelstein test, with female participants having a greater rate (59%, n=211). According to a current study Out of 191 university students, 108 (6.54%) had a negative finkelsteins test and only 83 (43.46%) had a positive finkelsteins test and 76(39.8%) of them had mild pain, 73 (38.2%) had moderate, 4 (2.1%) had severe and 38 (19.9%) had no pain [15]. Ali et al., found that 125(42%) of the 300 people who filled out the questionnaire felt discomfort in their thumb or wrist. When these members were subjected to the Finkelstein test, over half (n = 149) of them scored positive. The number of mobile phone users has surged, and the majority of individuals have passed the Finkelstein Test (p-value of 0.000) [16]. About partial amount of the students text more than 50 messages per day on their phones, and as a result of their phone keypads and the speed with which they text, they experience pain and weakness at the base of the thumb, demonstrating De Quervain's positive in these students and a positive relationship between thumb pain and frequent texting. Almost the same results showed in our current study out of 191 students. 108 (6.54%) had a negative finkelsteins test and only 83 (43.46%) had a positive finkelsteins test and 76 (39.8%) of them had mild pain, 73 (38.2%) had moderate, 4 (2.1%) had severe and 38 (19.9%) had no pain. Wolf et al., concluded in their study on treatment of De Quervain's tenosynovitis that age, sex, and hand dominance do not hand an association with hand outcomes. In contrast to our study same results showed that finkelsteins did not show an association with age, gender, and hand dominance as the p-value was 0.079 [17]. Kacmaz et al., 2019 concluded that all of the patients were female, with an average age of 41.3 (20-60) years, out of 300 students who completed the questionnaire. Nine individuals had problems with their left wrist, whereas six had problems with their right. There was no bilateral tenosynovitis in any of the individuals. Kinesiologic taping

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was applied to all patients for one month, with the tapes being replaced once a week. The mean VAS score before therapy was 8.13 ± 1.3, while the mean VAS score after treatment was 5.6 ± 2. The mean Q-DASH score before therapy was 69.4 ± 12.9, while the mean Q-DASH score after treatment was 53.5 ± 21.9. The mean Michigan Hand Outcomes Questionnaire score before therapy was 37.4 ± 12.5, while the mean score after treatment was 52.4 ± 19.1. Almost the same outcome is shown in our current research that the mean of the Michigan Hand Questionnaire (MHQ) among university students was 43.08 ± 11.48 (min 14 and max 63) and 76 (39.8%) of them had mild pain, 73 (38.2%) had moderate, 4 (2.1%) had severe and 38 (19.9%) had no pain [18]. An extensive community-based study conducted by K Walker et al., in the UK, revealed the prevalence of de Quervain's tenosynovitis was 0.5% in males and 1.3% in females. Out of 191, 100 (52.36%) were males and 91 (47.64%) were females, with 16 (64%) females having a positive finkelsteins test and only 9 (36%) males having a positive test [19]. According to a study performed by Tahir et al., individuals who texted 50 messages per day had 50% favorable results. 31% of the affected people reported light pain, 20% reported average discomfort, and the remaining 4% reported severe pain. The study shows that De Quervain's tenosynovitis (bilateral) showed that the analysis linked the patient's disease to overuse of a cellular phone's text messaging feature. However similar observation was seen in our research that 54 (70.1%) texted less than 50 messages per day, 19 (19.8%) texted 50-100 messages, and only 6 (50%) and 4 (66.7%) texted 100-200 and more than 200 receptively had positive finkelsteins test and those who have positive test were suffering from pain 76 (39.8%) of them had mild pain, 73 (38.2%) had moderate, 4 (2.1%) had severe and 38 (19.9%) had no pain [20].

CONCLUSIONS

The study discovered that nearly significant proportion of the students text on their phones, and that as a consequence of their mobile phones usage and extreme texting speed, they experience discomfort or pain at the bottom side of the thumb/wrist, illustrating De Quervain's progressive in those students and that there is an affirmative correlation between frequent text messaging and thumb pain. Overuse of the thumb muscle during hand motions, such as lengthy writing, frequent texting, and other overuse situations, might raise the risk of de Quervain's illness. In this study, the female gender has a larger role. According to the findings of the study, the frequency of De Quervain's Tenosynovitis is higher among students as a consequence of increasing online working patterns and texting. Those who are already feeling pain and discomfort can be fitted with braces to restrain the thumb and wrist.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Ilyas AM, Ast M, Schaffer AA, Thoder J. De quervain tenosynovitis of the wrist. Journal of the American Academy of Orthopaedic Surgeons. 2007 Dec; 15(12):757-64. doi: 10.5435/00124635-200712000-00009

[2] Awais L, Subazwari SA, Azam S, Anwar I. Incidence of De Quervain's Tenosynovitis in Computer Operators. Health Science Journal. 2020; 14(2):0-.

[3] Goel R and Abzug JM. de Quervain's tenosynovitis: a review of the rehabilitative options. Hand. 2015 Mar; 10(1):1-5. doi: 10.1007/s11552-014-9649-3

[4] Lee ZH, Stranix JT, Anzai L, Sharma S. Surgical anatomy of the first extensor compartment: A systematic review and comparison of normal cadavers vs. De Quervain syndrome patients. Journal of Plastic, Reconstructive and Aesthetic Surgery. 2017 Jan; 70(1):127-131. doi: 10.1016/j.bjps.2016.08.020

[5] Chaya B, Bakhach E, Bakhach J. The De-Quervain Tenosynovitis: Literature Review. Biomedical Journal. 2018; 1:3. doi: 10.26717/BJSTR.2018.08.001691

[6] Benites-Zapata VA, Jiménez-Torres VE, Ayala-Roldán MP. Problematic smartphone use is associated with de Quervain's tenosynovitis symptomatology among young adults. Musculoskeletal Science and Practice. 2021 Jun; 53:102356. doi: 10.1016/j.msksp.2021.102356

[7] Nemati Z, Javanshir MA, Saeedi H, Farmani F, Aghajani Fesharaki S. The effect of new dynamic splint in pinch strength in De Quervain syndrome: a comparative study. Disability and Rehabilitation: Assistive Technology. 2017 Jul; 12(5):457-461. doi: 10.3109/17483107.2016.1139635

[8] Morgan SD, Sivakumar BS, An VG, Sevao J, Graham DJ. A Review of De Quervain's Stenosing Tenovaginitis in the Context of Smartphone Use. Journal of Hand Surgery Asian Pacific Volume. 2020 Jun; 25(2):133-136. doi: 10.1142/S2424835520300029

[9] Walker-Bone K, Palmer KT, Reading I, Coggon D, Cooper C. Prevalence and impact of musculoskeletal disorders of the upper limb in the general population. Arthritis and Rheumatology. 2004 Aug; 51(4):642-51.

DOI: https://doi.org/10.54393/pbmj.v5i9.682

doi: 10.1002/art.20535
[10] Adams JE and Habbu R. Tendinopathies of the Hand and Wrist. Journal of the American Academy of Orthopaedic Surgeons. 2015 Dec; 23(12):741-50. doi: 10.5435/JAAOS-D-14-00216
[11] Taufiq F, Batool T, Bashir S. Prevalence of De-Quervain's Tenosynovitis among Medical Students of Allama Iqbal Medical College: JRCRS-2015, 3 (2): 95-98. Journal Riphah College of Rehabilitation Sciences. 2015 Dec; 3(2):95-8.
[12] Eapen C, Kumar B, Bhat AK, Venugopal A. Extensor Pollicis Longus Injury in Addition to De Quervain's with Text Messaging on Mobile Phones. Journal of Clinical and Diagnostic Research. 2014 Nov; 8(11):LC01-4. doi: 10.7860/JCDR/2014/8304.5094
[13] İnal EE, Demİrcİ k, Çetİntürk A, Akgönül M, Savaş S. Effects of smartphone overuse on hand function, pinch strength, and the median nerve. Muscle Nerve. 2015 Aug; 52(2):183-8. doi: 10.1002/mus.24695
[14] Ashurst JV, Turco DA, Lieb BE. Tenosynovitis caused by texting: an emerging disease. Journal of the American Osteopathic Association. 2010 May; 110(5): 294-6
[15] Ma T, Song L, Ning S, Wang H, Zhang G, Wu Z. Relationship between the incidence of de Quervain's disease among teenagers and mobile gaming. International Orthopaedics. 2019 Nov; 43(11):2587-2592. doi: 10.1007/s00264-019-04389-9
[16] Ali M, Asim M, Danish SH, Ahmad F, Iqbal A, Hasan SD. Frequency of De Quervain's tenosynovitis and its association with SMS texting. Muscles Ligaments and Tendons Journal. 2014 May; 4(1):74-8
[17] Wolf JM, Sturdivant RX, Owens BD. Incidence of de Quervain's tenosynovitis in a young, active population. Journal of Hand Surgery. 2009 Jan; 34(1): 112-5. doi: 10.1016/j.jhsa.2008.08.020
[18] Kaçmaz İE, Koca A, Basa CD, Zhamilov V, Reisoğlu A. Efficacy of Kinesiologic Taping in de Quervain's Tenosynovitis: Case Series and Review of Literature. Medical Journal of Bakirkoy. 2019 Sep; 15(3). doi: 10.4274/BTDMJB.galenos.2019.20180815084330
[19] Walker-Bone K, Palmer K, Reading I, Linaker C, Byng T, Coggon D, et al. The prevalence and impact of soft tissue musculoskeletal disorders of the neck and upper limb in the general population. Rheumatology. 2002 Apr; 41.
[20] Tahir M and Ahmad A. Frequency of De Quervains Syndrome among Smartphone Users in Different Universities of Lahore, Pakistan. Pakistan Journal of Physical Therapy (PJPT). 2018; 10-4.