

Frequency of De-Quervain Syndrome in Mobile Users Among Undergraduate Students of Allied Health Sciences Peshawar

Sohail Iqbal¹, Hafsa Gul Khattak², Saba Aman³, Kinza Anwar², Babar Ali³, Hazrat Bilal Malakandi³

ABSTRACT

Background: Repetitive strain injuries are more common in mobile phone users due to repetitive use of phone for mobile texting and games. De Quervain syndrome is a painful complaint of the wrist as stenosing tenosynovitis involving abductors of thumb at radial styloid process. The inflammation of first dorsal compartment of wrist triggers pain in De Quervain syndrome. Cell phone users who are involved in repetitive activities of thumb during text messages are more prone to develop repetitive strain injuries.

Objectives: To determine the frequency of De Quervain syndrome in mobile users among undergraduate students of allied health sciences Peshawar.

Methods: A cross-sectional study was conducted among undergraduate students in different institutes of allied health sciences Peshawar. Sample size of 384 was selected using convenient sampling technique. Data was collected through self-administered questionnaire and Universal Pain Assessment Tool was used to assess the severity of pain. Finkelstein test was performed to diagnose De Quervain's syndrome. Data was analyzed by using SPSS version 20.

Results: Mean age of the participants was 20.73±1.78 years. Out of 384 participants, 315 (82%) were male and 69 (18%) were females, with male to female ratio 4:1 respectively. Finkelstein test was positive in 223 (58.1%) participants and negative in 161 (41.9%) participants.

Conclusion: The study concluded that mobile phone users are at a greater risk of developing De Quervain's syndrome due to repetitive movement of thumb while mobile texting, playing games without taking rest in-between activities.

Key words: De Quervain syndrome, Finkelstein test, Repetitive strain injury, Wrist pain.

DOI: <https://doi.org/10.33897/fujrs.v1i1.229>

Introduction:

De Quervain's tenosynovitis was first defined by Fritz De Quervain in 1895. He defined it as a painful complaint of the wrist as stenosing tenosynovitis involving abductors of thumb at radial styloid process.(1) The inflammation of first dorsal compartment of wrist triggers pain in De Quervain syndrome. The first dorsal compartment contains tendons of extensor pollicis brevis and abductor pollicis longus.(2) Cell phone users involved in repetitive activities of thumb during text messages are more prone to develop repetitive strain injuries. Repetitive strain injury is a term used for injury occurring due to the same movements performed repeatedly leading to pain and inflammation in soft tissues (muscles, tendons, ligaments).(3) It is seen that smart phone usage is

more common in young population due to its numerous attractive and interesting applications. Apart from its beneficial effects of usage, smart phones lead to musculoskeletal disorders.(4) The tremendous increase of cell phones in current era primarily involves the dexterousness of thumb functions. The use of text messages on mobile phones has a great concern on musculoskeletal disorders for the users. Beside soft tissue injuries, carpometacarpal joint of thumb also shows subluxation and arthritis in persons who excessively use cell phones for texting.(5)

The history and clinical examination can easily diagnose this disease. Patient reporting with pain at the site of radial styloid have shown a local tenderness and local swelling in some cases upon their clinical examination.(6) The standard finding in De Quervain's tenosynovitis is a positive Finkelstein test. Finkelstein test is performed when the thumb is flexed into the palm and wrist is ulnar deviated. The test is considered positive if person complains of pain at dorsolateral aspect of wrist joint. For better comparison, the test should be performed on wrist joints bilaterally.(7) According to a report published in 2009, 106 billion messages

Affiliations: 1. Riphah College of Rehabilitation Sciences, Riphah International University Swat; 2. University of Lahore, Islamabad Campus; 3. NCS university, Peshawar.

Correspondence: Dr. Kinza Anwar PT

Email: kinza.anwar29@gmail.com

Received: October 23rd 2020; **Revision:** November 26th 2020; **Acceptance:** December 24th 2020

were sent through five mobile networks in Pakistan. Although frequent use of mobile phones and thumb pain due to repetitive strain has a positive relation, no significant research studies have been conducted to create awareness about the consequences of excessive use of mobile phones among general population.(8) The current study will make people aware about the occurrence of De quervain syndrome due to excessive mobile phone use. The objective of the study was to determine the frequency of De Quervain syndrome in mobile users among under-graduate students of Allied Health Sciences, Peshawar.

Methods:

A cross-sectional study design was used to conduct the research. Convenient sampling technique for collection of sample was used, which is a type of non-probability sampling. The data was collected from different institutes of Allied Health Sciences in Peshawar. 384 participants were selected according to inclusion and exclusion criteria. The study included both male and female students, who were using mobile phones and were willing to participate in the study. The study excluded persons who had traumatic wrist injury, had gone through any kind of wrist surgery and person with de quervain disease but not using mobile phone.

After approval from research ethical committee of NCS university (NCS/PES/REC/Letter-00147), 384 mobile phone users fulfilling the inclusion and exclusion criteria were selected. Participants were informed verbally about the aims and objectives of the current study. Informed consent was taken from every participant meeting the inclusion criteria. The confidentiality of participant’s information was ensured.

Self-administered questionnaire was used for data collection. Hard copy of the questionnaire was distributed among the participants. Questionnaire had two sections, Demographic characteristics and Questions related to De Quervain tenosynovitis. Data was analyzed by using SPSS version 22. Descriptive statistics were applied to calculate mean and standard deviation of age of participants and duration of symptoms. Frequencies and percentages were calculated for qualitative variables like gender and presence and absence of De Quervain syndrome. Chi-square was applied to determine association between different variables and Finkelstein test. P value <0.05 was considered significant.

Results:

Mean age of the participants was 20.73±1.78 years. Out of 384 participants, 315(82%) were male

and 69(18%) were females, with male to female ratio 4:1 respectively. Finkelstein test was positive in 223(58.1%) participants while the test was negative in 161(41.9%) participants.

No significant association (Table 1) between finkelstein test and type of mobile phone was observed. Results showed that in key pad or regular mobile phone users the test was positive in 26 (6.8%) and negative in 19(4.9%) with a total of 45 (11.7%) while in touch screen mobile users test was positive in 178(46.4%) and negative in 130 (33.9%) total of 308(80.2%). The participant who were using both touch screen and keypad the test was positive in 19(4.9%) and negative in 12(3.1%) total of 31(8.1%). It was also noted that mobile phones were frequently used by students for texting. Among 384 students 256(66.7%) students texted <50 texts per day, 88(22.9%) students sent 50-100 texts, 36(9.4%) students sent texts between 100-200 and 4(1%) students sent more than 200 texts per day. (Table 1)

Table 1: Association of Finkelstein test with type of mobile phone used and number of text per day

Variables	Attributes	Finkelstein test		P-value
		Positive	Negative	
Type of mobile use	Keypad	6.8%(n=26)	4.9%(n=19)	0.93
	Touch screen	46.6%(n=178)	33.9%(n=130)	
	Both	4.9 %(n=19)	3.1%(n=12)	
Number of text per day	Less than 50	61.9%(n=138)	73.3%(n=118)	0.01
	50-100	23.8%(n=53)	21.7%(n=35)	
	100-200	13 %(n=29)	4.3 %(n=07)	
	More than 200	01%(n=03)	0.6%(n=01)	

Discussion:

De Quervain syndrome is stenosing tenosynovitis of first dorsal compartment of wrist. The first dorsal compartment of wrist includes extensor pollicis brevis and abductor pollicis longus. In this syndrome, tendons become inflamed and person experiences pain at dorsolateral side of wrist sometimes radiating to lateral forearm. Repetitive activities of thumb is considered the cause of this syndrome. Activities of thumb like using mobile phone while texting involves a lot of repetition of thumb making the tendons in first dorsal compartment inflamed.(9)

The findings of our study suggest that De Quervain syndrome is more common in mobile phone users due to frequent use of mobile phone for multiple purpose (e.g. texting, games, internet) but most of the common is sending text messages. Pew research Centre reported that use of mobile phones has increased among teen and young adults in the past few years.(10) Mean age of the participants in the current study was 20.73± 1.77years. Out of the

total number of students who participated in the study, 315(82%) were males and the rest 69(18%) were females. Finkelstein test was positive in 41 (10.7%) females and negative in 28(7.3%) females. In contrast, the test was positive in 182(47.4%) males and negative in 133(34.6%).

A recent study concluded that increasing use of mobile phones was associated with increased risk of developing De Quervain syndrome.67% students showed positive finkelstein test and who were frequent mobile phone users.(11)

According to a survey conducted by Princeton survey research associates, American teens are sending enormous number of text messages to friends and colleagues. Sending text messages in current era is the easiest and fastest way of communication surpassing face to face contacts. (12)

A study conducted on Extensor pollicis longus injury in addition to De Quervain's with text messaging on mobile phones showed that changes were noted clinically and by ultrasound of thumb in persons using mobile phone repetitively. They reported that on clinical examination, finkelstein test was positive in 40% of cases. Moreover, changes were found in first and third compartments through ultrasound examination.(13)

Prevalence study on cumulative trauma disorder in cell phone users in 2010 suggested that use of mobile phone has become very common in young generation, predisposing them to musculoskeletal disorders of hand. Cumulative traumatic disorders were found to be 18.5% in upper limb with greater prevalence of MSK issues in thumb (52%).(14)

A similar study conducted in 2016 to evaluate prevalence of De Quervain syndrome among young mobile users had a mean age of 22.4±4.02. The findings of this study are consistent with the results of the current study that De Quervain is common among young mobile users.(15)

In the world of technology, use of mobile phones is increasing day by day and it is among one the necessities of life.(16) Younger generation is using mobile phone for texting and gaming purpose. Apart from its useful implication in advancement, the use of mobile makes the younger generation prone to musculoskeletal and repetitive strain injuries.(17) Frequent use of mobile phone is a trigger for de quervain syndrome. In order to prevent hand dysfunction, appropriate break should be taken between mobile phone usage.

Conclusion :

The study concluded that mobile phone users from different institutes of Peshawar are prone to develop De Quervain's syndrome due to

repetitive movement of thumb while mobile texting, playing games without taking rest in between activities.

Disclaimer: None

Conflict of interest: Last author is also secretary of research ethical committee issuing ethical approval and signing person of ethical approval.

Funding source: None

References:

1. Vuillemin V, Guerini H, Bard H, Morvan G. Stenosing tenosynovitis. *Journal of ultrasound*. 2012;15(1):20-8.
2. Moore KL, Dalley AF. *Clinically oriented anatomy*. Wolters kluwer india Pvt Ltd; 2018 Jul 12.
3. Kelly I. RSI - Repetitive Strain Injury 2020. Available from: <https://physioworks.com.au/pain-injury/arm-pain/rsi-repetitive-strain-injury/>.
4. Jeong H, Lee Y. Smartphone addiction and empathy among nursing students. *Advanced Science Technology Letters*. 2015;88:224-8.
5. Ming Z, Pietikainen S, Hänninen O. Excessive texting in pathophysiology of first carpometacarpal joint arthritis. *Pathophysiology*. 2006 Dec 1;13(4):269-70.
6. Palmer K, Walker-Bone K, Linaker C, Reading I, Kellingray S, Coggon D, Cooper C. The Southampton examination schedule for the diagnosis of musculoskeletal disorders of the upper limb. *Annals of the rheumatic diseases*. 2000 Jan 1;59(1):5-11.
7. David J, Magee M, Robert C. *Orthopedic Physical Assessment*: Saunders; 2020.
8. Sivapragasam N. The future of the public phone: Findings from a six-country Asian study of telecom use at the BOP. In 4th Communication Policy Research, South Conference, Negombo, Sri Lanka 2009 Dec 7.
9. Mezei G, Benyi M, Muller A. Mobile phone ownership and use among school children in three Hungarian cities. *Bioelectromagnetics: Journal of the Bioelectromagnetics Society, The Society for Physical Regulation in Biology and Medicine, The European Bioelectromagnetics Association*. 2007 May;28(4):309-15.
10. Lenhart A, Purcell K, Smith A, Zickuhr K. *Social Media & Mobile Internet Use among Teens and Young Adults*. Millennials. Pew internet & American life project. 2010 Feb 3.
11. Hetaimish B, Bossei A, Turkstani G, Al-Jezani K, Al-Motairi K. Prevalence of De-Quervain's Tenosynovitis Among Medical Professionals. *Middle East Journal of Family Medicine*. 2020

-
- Jan 1;7(10):125.
12. Lenhart A, Ling R, Campbell S, Purcell K. Teens and mobile phones: Text messaging explodes as teens embrace it as the centerpiece of their communication strategies with friends. Pew internet & American life project. 2010 Apr 20.
 13. 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: JCDR. 2014 Nov;8(11):LC01.
 14. Eapen C, Kumar B, Bhat AK. Prevalence of cumulative trauma disorders in cell phone users. Journal of Musculoskeletal research. 2010 Sep;13(03):137-45.
 15. Nisa Z, Umer B, Hassan T. Prevalence of De Quervain's Syndrome Among Young Mobile Phone Users. Journal of Riphah College of Rehabilitation Sciences. 2016;4(1):22-4.
 16. Gordon S. Beware the'Blackberry Thumb'New Repetitive Stress Injury Caused by Typing only with thumbs on hand-held devices. US News & World Report. 2008.
 17. Gustafsson E, Johnson PW, Hagberg M. Thumb postures and physical loads during mobile phone use—A comparison of young adults with and without musculoskeletal symptoms. Journal of Electromyography and Kinesiology. 2010 Feb 1;20(1):127-35.

Author Contribution:

Iqbal S: Acquisition of Data, Data analysis and interpretation

Khattak HG: Conception & design of study, Data analysis & interpretation, Drafting of manuscript, critical revision, Approval for final version of manuscript.

Aman S: Acquisition of Data, Data analysis and interpretation

Anwar K: Data analysis and interpretation, Drafting of manuscript, Critical revision and Approval for final version of manuscript

Ali B: Acquisition of Data

Malakandi HB: Data analysis and interpretation.
