



MOBILE PHONE AND ITS ASSOCIATED FACTORS LEADING TO DE-QUERVAIN'S DISEASE AND ITS PREVALENCE IN YOUTH – A CROSSECTIONAL SURVEY BASED STUDY

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ABSTRACT:

INTRODUCTION- With the new occupational and professional demands the prevalence of De-Quervain's disease is also increasing gradually. Previous studies showed that there will be increased load on the thumb while using electronic devices or other devices that involve frequent use and movement of the thumb, and therefore a higher prevalence of musculoskeletal disorders. Mobile phone use is growing exponentially and its hazardous consequences are affecting the user's life.

AIM- To find out the Mobile phone and its associated factors leading to De-Quervain's Disease and its prevalence in youth.

METHOD- 116 individuals were taken according to inclusion criteria. Data collection was done by using a questionnaire. In addition to the questionnaire, the severity of the pain was assessed through the Numerical Pain Rating Scale and De-Quervain's disease have been diagnosed through the Finkelstein test.

RESULT- Finkelstein test when done on students out of 116 more than half (n=65) 56.03% showed positive results. NPRS score obtained during the test was more in the dominant hand compared to the non-dominant hand with a p-value of 0.00. There was a significant association between the duration of phone use and the development of the condition with P-value 0.002 as well as the number of text messages per day and development of the condition with P-value 0.000. Also, the bigger mobile phone size compared to the hand has more prevalence of developing this condition with P-value 0.042.

CONCLUSION- There was a significant association between the duration of mobile phone use and the presence of De Quervain's disease. The current study also showed 56.03% prevalence of De Quervain's disease.

KEYWORDS- Association, De Quervain's Disease, Dominant, Finkelstein test

INTRODUCTION

De Quervain's disease occurs due to the inflammation of the two tendons, extensor pollicis brevis, abductor pollicis longus tendons, and the thickening of the synovial sheath, this leads to a common cause of wrist pain that occurs in adults.¹ De Quervain's tenosynovitis (disease) was first described by Fritz de Quervain in 1895 as a pain in the wrist caused due to inflammation of the tendon sheath of the extensor pollicis brevis and abductor pollicis longus tendons.² After its discovery, this condition has been given other names such as BlackBerry thumb, texting tenosynovitis, washerwoman's sprain, teen texting tendonitis, gamer's thumb, WhatsAppitis, and radial styloid tenosynovitis, all of which involves repeated wrist movements and thumb pinching.³

Hobbies and occupations that require repetitive adduction of the thumb with ulnar deviation of the wrist and abduction of the thumb under the stress of grasping motions e.g., golfing, typewriting, and piano playing, can cause trauma to the tendons and their sheaths and result in this condition.⁴ Females are more likely to be affected by this disease than males.⁵

In addition to pain along the radial aspect of the wrist at the base of the thumb, swelling in the anatomic snuffbox can also be noted in some cases.⁶ The diagnosis of de Quervain's tenosynovitis is made based on the history and physical examination findings.⁷ The pain is exacerbated by tucking the thumb under the other fingers during ulnar deviation of the wrist. This is indicated as a positive Finkelstein's sign.⁸ Various non-operative and operative treatments have been advocated for this condition.⁹ Options include anti-inflammatory medication, corticosteroid injections, ultrasound therapy and occupational therapy, such as splinting and physical therapy. Surgical release of the involved tendons is the operative approach in some cases.^{10,11}

The prevalence and incidence of De-Quervain's tenosynovitis in primary care are still unknown¹². Some reports reveal multiple causes for De-Quervain's Disease reveals acute trauma or tremendous exercise. Still it may more commonly be due to accumulative micro-trauma. Hence, using their hands and especially the thumb in monotonous routines are prone to get De-Quervain's. The patients could also experience limitation of range of motion and progressive pain in thumb.¹³ The study examined the role of age in de Quervain's tenosynovitis and concluded that the disease is more frequent among females in their forties to sixties.¹⁴ With the new occupational and professional demands the prevalence of this condition is also increasing gradually.¹⁵

Previous studies showed that there will increased load on the thumb while using electronic devices or other devices that involve frequent use and movement of the thumb, and therefore a higher prevalence of musculoskeletal disorders.^{3,16,17} Smartphone functions represent great potential for applications in medical education, as they allow doctors and students to access resources efficiently to support better decision-making at the point of care.^{18,19,20,21} Despite their benefits, excessive use could result in various physical effects such as wrist or neck pain, and may be associated with disturbances of anxiety and sleep.^{22,23}

The mobile phone use is growing exponentially and its hazardous consequences are affecting the user's life. So, this study is aim to find out the prevalence of De Quervains Disease and its association with mobile phone use in todays youth as this age group cannot be ruled for its predisposition to De Quervains Disease. Also, this study will help the people make aware about their future predisposition towards likely developing this condition and will aware them about the physiotherapy treatment for conservatively managing the condition.

MATERIAL AND METHODOLOGY

➤ **MATERIAL USED**

- Chair, Table, Pen

➤ **METHODOLOGY**

Study Design: Crosssectional survey-based study

Method of Sampling: Convenient sampling

Sample Size: 116

cochran formula: $n^0 = z^2 pq/e^2$

Place of Study: Dr.Ulhas Patil College of Physiotherapy, Jalgaon

Study Duration: 6 months

➤ **SELECTION CRITERIA:**

Inclusion criteria

1. Subjects between age group of 19-26 years.
2. All male and female mobile phone users

Exclusion criteria

1. Individuals having musculoskeletal or neurological disorder in upper limb.
2. Individuals having and kind of deformity in upper limb.

➤ OUTCOME MEASURES

1. Finkelstein test was used to diagnose De Quervain's Disease.
2. Numerical Pain Rating Scale (NPRS) was used to find out the pain intensity in dominant as well as non-dominant hand.
3. Data collection sheet and questionnaire to know the individuals demographic data and to find an association between various factors related to mobile phone use and positive Finkelstein test.

PROCEDURE

A cross-sectional survey based study has been conducted among youth in Dr. Ulhas Patil College of Physiotherapy, Jalgaon. To conduct the following study approval from the ethical committee of Dr. Ulhas Patil College of Physiotherapy, Jalgaon was taken. Individuals were selected according to the inclusion criteria. The procedure was explained and a written consent was obtained from the individuals.

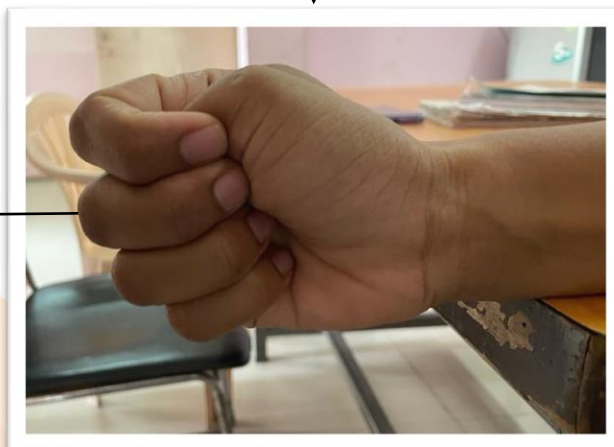
The sample size 116 was calculated by using the standard formula for calculating sample size on the basis of estimation of population proportion.

$$n = Z^2 PQ / E^2 \quad P=0.42, \text{ allowable error}=0.09$$

Data collection was done, the questions were asked according to the questionnaire, including information such as type of mobile phone used by the individuals for text, number of text messages per day, experiencing pain in the thumb/wrist, swelling or snapping sound over thumb and restriction or pain aggravation while handling different things. In addition to the questionnaire, severity of the pain was assessed through Numerical Pain Rating Scale and De Quervain's Disease have been diagnosed through Finkelstein test.³

The individuals were instructed to make a fist with the thumb enfolded inside the fingers. The examiner will stabilize the forearm and passively deviated the wrist. Pain at the radial wrist, over the Abductor pollicis longus and Extensor pollicis brevis tendons, a positive test indicated, when it is significantly more tender than the uninvolved side.²⁴

FINKELSTEIN TEST REPRESENTATION



STATISTICAL ANALYSIS

Data entry was done using computer software MS-Excel and analysis was done using Mini tab-13. Frequency and percentage were taken for categorical variable. When the comparison of means of NPRS Right vs NPRS Left among right/ left dominance Group was done by paired t-test Chi-square was applied to determine association between different variables and Finkelstein test. P-value < 0.005 was considered significant.

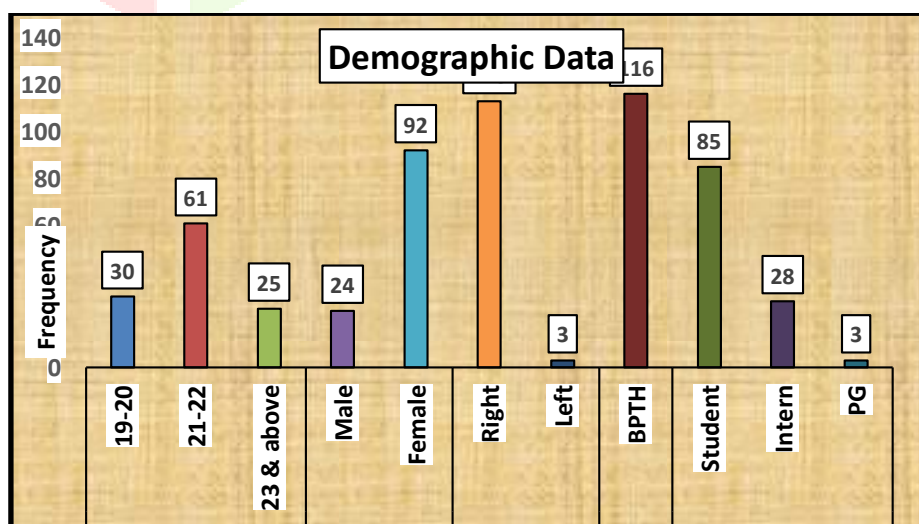
RESULT

Total number of students participated in study was 116, out of the total number of students who participated in the study, 92 (79.31%) were females and remaining 24 (20.69%) were males with a male to female ratio of 1:4 respectively. Majority were the students of Dr. Ulhas Patil College of Physiotherapy of age group of (21-22) studying in third and final year courses of Physiotherapy. In which the dominance 113(97.41%) of participants were right handed and 3(2.59%) were left handed.

Frequency Distribution Table

Sr. No.	Variable	Groups	Frequency	Percentage
1	Age	19-20	30	25.86
		21-22	61	52.59
		23 & above	25	21.55
2	Gender	Male	24	20.69
		Female	92	79.31
3	Dominance	Right	113	97.41
		Left	3	2.59
4	Education	BPTH	116	100.00
5	Occupation	Student	85	73.28
		Intern	28	24.14
		PG	3	2.59

Finkelstein test when done on students out of 116 more than half (n=65) 56.03% showed positive results.



Test	Result	Frequency	Percentage
Finkelstine test	Positive	65	56.03
	Negative	51	43.97

Most of the students were using their mobile phones with their dominant hand. It was found that the NPRS score obtained during the test was more in the dominant hand compared to the non-dominant hand with a p-value of 0.00 which is extremely significant. Individuals who were using mobile phones with their dominant hand had more pain on NPRS compared to their non-dominant hand.

Dominance Right - (Paired t test)

Variable	Groups	N	Mean	SD	t value	p value
Dominance Right	NPRS Right	113	2.75	2.57	5.37	0.000
	NPRS Left	113	1.25	1.50		

When the comparison of means of NPRS Right vs NPRS Left among left dominance group was done, we did not find a significant association as seen in the right dominant group, with a p-value of 1.00.

Dominance Left - (Paired t test)

Variable	Groups	N	Mean	SD	t value	p value
Dominance Left	NPRS Right	3	2.00	2.00	0.00	1.00
	NPRS Left	3	2.00	2.65		

Regarding the use of cell phones, all the participants were using smart phone. More than half of the students were using mobile phones for internet browsing 40(57.9%) out of 69(59.4%) participants were tested positive for finkelstein sign, another 21 (18.1%) were using smartphones for texting out of which 18 (85.7%) participants were tested positive for Finkelstein sign, other purpose for using mobile phone was games 6(5.1%) and for academics 11(9.48%) participants.

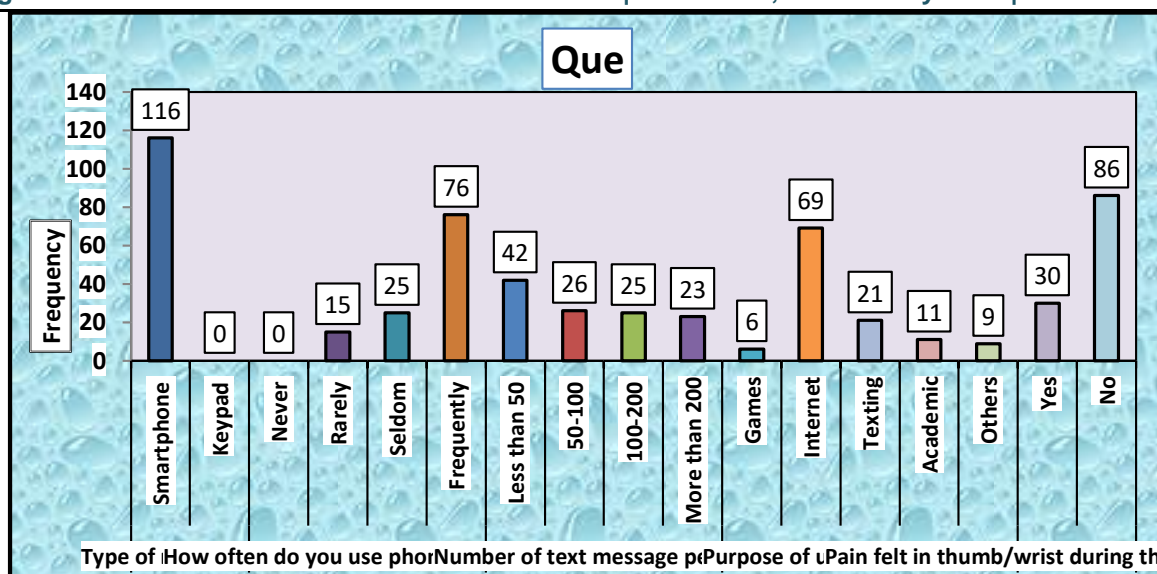
Regarding the use of phone for texting 76 (65.52%) of participants were using smartphones for texting frequently out of which 47 (61.8%) of participants have tested positive for Finkelstein test. About 25 (21.5%) participants were using there phone for texting seldomly out of which 12(48%) tested positive for Finkelstein test and 15(12.9%) participants were using rarely out of which 6(40%) tested positive for Finkelstein sign, the values obtained were not significant p value = 0.19. Regarding the number of text messages per day 42(36.21%) were texting less than 50 messages per day out of which 19(45.2%)tested positive for Finkelstein test, another 26(22.4%) did texting between 50-100 messages per day out of which 10(38.4%) were tested positive for Finkelstein test, about 25(22.5%) participants did texting between 100-200 text messages per day out of which 16(64%) tested positive, and about 23(19.8%) did texting for more than 200 messages per day out of which 20(86.9%) have tested positive for Finkelstein test. This concludes that there was significant association between number of text messages per day with Finkelstein test result with p value=0.002

Frequency Distribution Table

Sr. No.	Que	Option	Frequency	Percentage
1	Type of mobile phone	Smartphone	116	100.00
		Keypad	0	0.00
2	How often do you use phone for texting?	Never	0	0.00
		Rarely	15	12.93
		Seldom	25	21.55
		Frequently	76	65.52
3	Number of text message per day?	Less than 50	42	36.21
		50-100	26	22.41
		100-200	25	21.55
		More than 200	23	19.83
4	Purpose of using mobile phones?	Games	6	5.17
		Internet	69	59.48
		Texting	21	18.10
		Academic	11	9.48
		Others	9	7.76
6	Pain felt in thumb/wrist during the use of mobile?	Yes	30	25.86
		No	86	74.14

When analyzed for association between Finkelstein test and pain felt in thumb/wrist during use of mobile phone it was observed that 30(25.8%) participants reported pain in thumb/wrist all test positive for Finkelstein test and 86(74.14%) participants were not having pain out of which 35(40.6%) tested positive. There was significant association between positive Finkelstein test and thumb/wrist pain (p value = 0.000).

Sr. No.	Que	Option	Finkelstine test		Chi-square	d.f.	P value	Significance
			Positive	Negative				
1	Type of mobile phone	Smartphone	65	51	* Cannot compute Chi-Square			
		Keypad	0	0				
2	How often do you use phone for texting?	Never	0	0	3.26	2	0.19	Not Significant
		Rarely	6	9				
		Seldom	12	13				
		Frequently	47	29				
3	Number of text message per day?	Less than 50	19	23	14.81	3	0.002	Significant
		50-100	10	16				
		100-200	16	9				
		More than 200	20	3				
4	Purpose of using mobile phones?	Games	5	1	27.62	4	0.000	Significant
		Internet	40	29				
		Texting	18	3				
		Academic	0	11				
		Others	2	7				
6	Pain felt in thumb/wrist during the use of mobile?	Yes	30	0	31.75	1	0.000	Significant
		No	35	51				



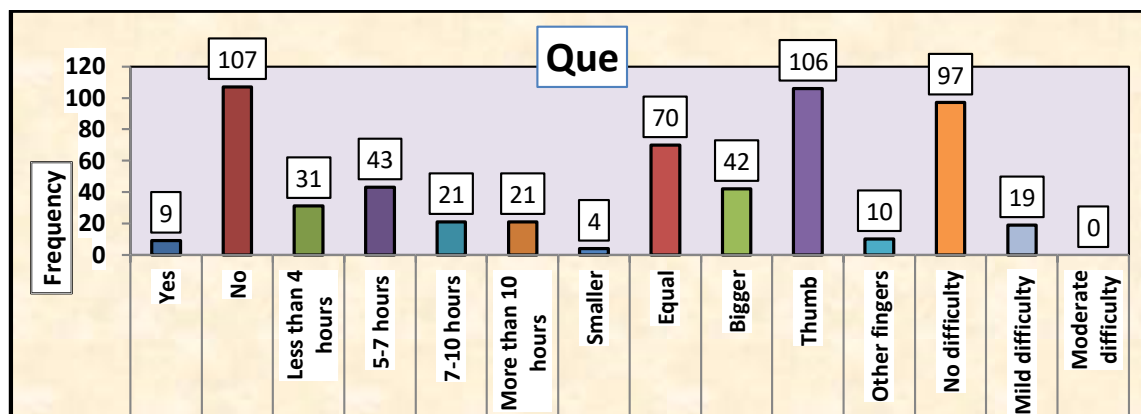
Chi- Square Test – Association

There were 9 (7.76%) participants who had numbness/tingling in hand/finger out of which 8(88.8%) were tested positive for Finkelstein sign, where as 107(92.24%) have no tingling/numbness in hand/fingers where p value= 0.039 which is significant.

Sr. No.	Que	Option	Frequency	Percentage
7	Numbness/tingling in the hand/fingers?	Yes	9	7.76
		No	107	92.24
8	Duration of using mobile phones per day?	Less than 4 hours	31	26.72
		5-7 hours	43	37.07
		7-10 hours	21	18.10
		More than 10 hours	21	18.10
9	Phone size compared to your hand?	Smaller	4	3.45
		Equal	70	60.34
		Bigger	42	36.21
10	Mode of sliding on phone?	Thumb	106	91.38
		Other fingers	10	8.62
11	Difficulty with thumb movement?	No difficulty	97	83.62
		Mild difficulty	19	16.38
		Moderate difficulty	0	0.00

Regarding duration of using mobile phones per day out of 116 total participants 65(56.03%) who tested positive with Finkelstein test, 4(12.9%) participants used mobile phone for less than 4 hours, 20(46.5%) participants used phones for 5-7 hours, 20 (95.4%) participants used mobile phones, p value= 0.000 which is extremely significant as the duration of using smartphone use increases the prevalence of De Quervain's disease is also increased. When participants were asked for the size of phone according to there hand 4(3.45%) participants were having smaller phone out of which 2(50%) participants were tested positive for Finkelstein sign, another 70(60.34%) participants were having equal size of phone compared to hand out of which 33(47.1%) have test positive for Finkelstein sign and 42(36.21%) participants were using bigger phone compared to there hand out of which 30(71.4%) participants have tested positive for Finkelstein sign.

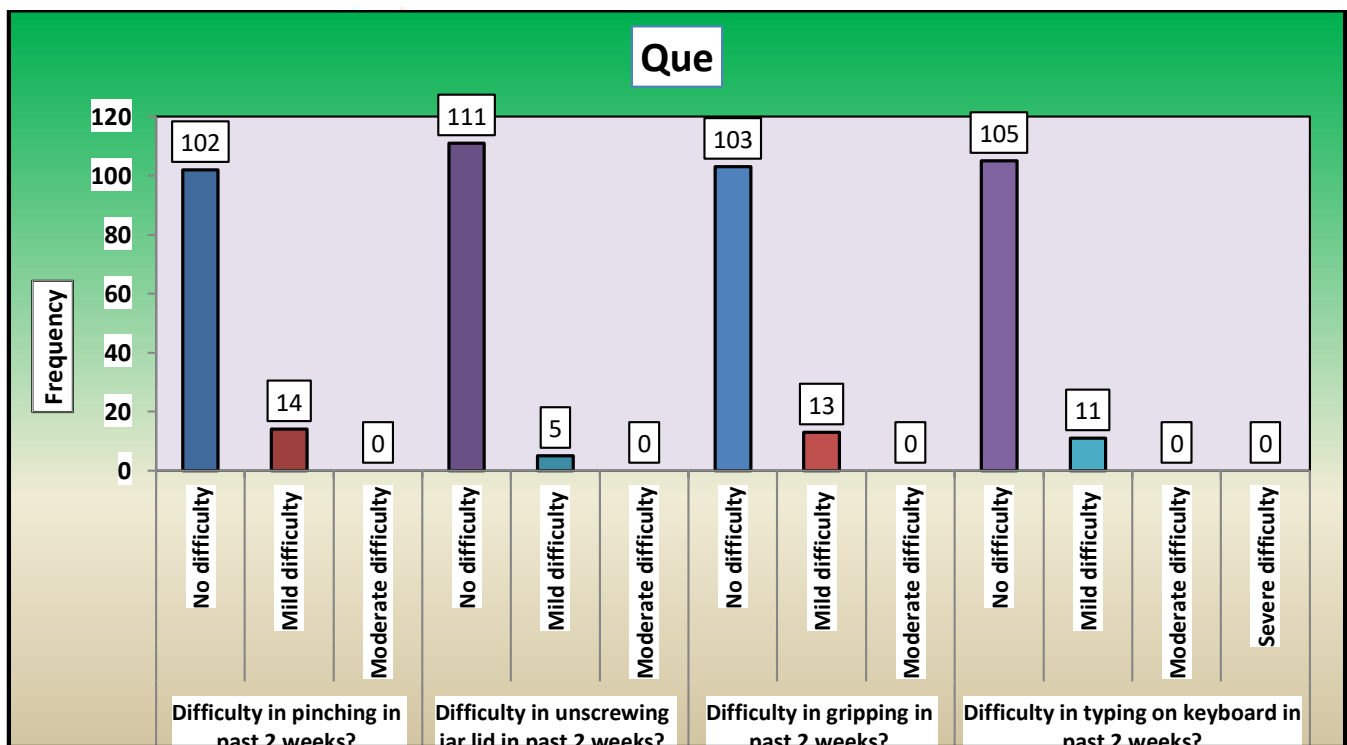
The prevalence found was significantly associated with De Quervain's Disease, in bigger smartphone users the prevalence of De Quervain's Disease was higher. When asked for mode of sliding on smartphone about 106(91.38%) were using thumb for sliding on smartphone and 10(16.38%) were using other fingers for sliding, students using thumb for sliding are more prone to De Quervain's Disease. Out of 65 positive students 19(16.38%) were having mild difficulty in thumb movements and about 97(83.62%) were having no difficulty (p value = 0.000).



Sr. No.	Que	Option	Finkelstine test		Chi-square	d.f.	P value	Significance
			Positive	Negative				
7	Numbness/tingling in the hand/fingers?	Yes	8	1	4.27	1	0.039	Significant
		No	57	50				
8	Duration of using mobile phones per day?	Less than 4 hours	4	27	54.56	3	0.000	Significant
		5-7 hours	20	23				
		7-10 hours	21	0				
		More than 10 hours	20	1				
9	Phone size compared to your hand?	Smaller	2	2	6.24	2	0.042	Significant
		Equal	33	37				
		Bigger	30	12				
10	Mode of sliding on phone?	Thumb	65	41	13.94	1	0.000	Significant
		Other fingers	0	10				
11	Difficulty with thumb movement?	No difficulty	46	51	17.82	1	0.000	Significant
		Mild difficulty	19	0				
		Moderate difficulty	0	0				

When different hand movements over the past two weeks were compared with Finkelstein test significant p values were observed with certain movements. Out of 65(56.03%) students who tested positive with Finkelstein test 51(78.4%) of students were having no difficulty in pinching and 14(21.5%) students were having mild difficulty in pinching in past 2 weeks (p value = 0.000). Difficulty in unscrewing the jar lid 60(92.3%) have no difficulty and 5(7.69%) were having mild difficulty (p value = 0.043). Difficulty in gripping showed that 13(20%) students showed mild difficulty in gripping in past two weeks (p value = 0.001) for difficulty in typing on keyboard 54(83%) were having no difficulty whereas 11(17%) were having mild difficulty in typing on keyboard for past two weeks (p value= 0.002).

Sr. No.	Que	Option	Frequency	Percentage
13	Difficulty in pinching in past 2 weeks?	No difficulty	102	87.93
		Mild difficulty	14	12.07
		Moderate difficulty	0	0.00
14	Difficulty in unscrewing jar lid in past 2 weeks?	No difficulty	111	95.69
		Mild difficulty	5	4.31
		Moderate difficulty	0	0.00
15	Difficulty in gripping in past 2 weeks?	No difficulty	103	88.79
		Mild difficulty	13	11.21
		Moderate difficulty	0	0.00
16	Difficulty in typing on keyboard in past 2 weeks?	No difficulty	105	90.52
		Mild difficulty	11	9.48
		Moderate difficulty	0	0.00
		Severe difficulty	0	0.00



Sr. No.	Que	Option	Finkelstine test		Chi-square	d.f.	P value	Significance
			Positive	Negative				
13	Difficulty in pinching in past 2 weeks?	No difficulty	51	51	12.49	1	0.000	Significant
		Mild difficulty	14	0				
		Moderate difficulty	0	0				
14	Difficulty in unscrewing jar lid in past 2 weeks?	No difficulty	60	51	4.1	1	0.043	Significant
		Mild difficulty	5	0				
		Moderate difficulty	0	0				
15	Difficulty in gripping in past 2 weeks?	No difficulty	52	51	11.48	1	0.001	Significant
		Mild difficulty	13	0				
		Moderate difficulty	0	0				
16	Difficulty in typing on keyboard in past 2 weeks?	No difficulty	54	51	9.53	1	0.002	Significant
		Mild difficulty	11	0				
		Moderate difficulty	0	0				
		Severe difficulty	0	0				

DISCUSSION

The study was to find out the prevalence of the De Quervains Disease and its association with the smart phone use in the age group of 18-25 years. In this study Finkelstein's test was used to screen and diagnose them as De Quervain's Disease. Out of 116 participants 65 (56.03%) shown positive for the De Quervains Disease here after it will be referred as De Quervain's Disease.

The current study is in accordance with the study done by Samuel Dj Morgan et.al they found that 51.54% of participants have shown positive De Quervain's Disease.²⁵ In another study done by Bashareada et.al found that 68.9% students were having positive De Quervain's Disease.²⁶ This shows that study procedure was rightly followed. An Indian meta-analysis study found that the percentage of smartphone addicts ranged from 39% to 44%, and reported that smartphone usage is increasing because it is becoming a fundamental way to spend free time.²⁷ In a study from China 43.4% of participants experienced thumb/wrist pain due to the use of different electronic devices.¹⁷

In the present study total of 116 participants were screened out which 92 (79.31%) female among that 52 (56.5%) found to be positive for Finkelstein's sign, and from the 24 (20.69%) male participants 20 (62.5%) found to be positive to Finkelstein's sign, these values are in accordance with the study done by a study done by Bashar Reada et.al among the 192 (56.8%) female participants, more than half 137 (71.35%) had a positive Finkelstein's sign, and among the 146 (43.2%) male participants, more than half 96 (65.75%) were positive.²⁶ In the present study, there was no significant differences between male and female participants because only students were focused not the general population.

This current study has found that the frequency of De Quervain's Disease is significantly associated with the size of smartphone used and its comparison with the hand size. The frequency of De Quervain's Disease is significantly higher in individuals with bigger smartphone size as compared to hand. So out of 42 participants 30 (71.42%) tested positive for De Quervain's Disease who were having bigger smartphones, 33 (47.14%) out of 70 participants tested positive for De Quervain's Disease these were having equal size of smartphone compared to hand and 02 (50%) participants out of 4 tested positive for De Quervain's Disease were using smaller smartphone size compared to hand. The present study goes in favour of study done by Bashar Reada et.al in 2020 regarding the correlation between a positive Finkelstein's sign and smartphone size relative to hand size shown that 64 (69.6%) students were having positive Finkelstein's sign as

compared to those who were having smaller smartphones than their size of hand, 151 (69.3%) students having smartphone of similar size to their hands, and 18 (64.3%) students were using a bigger smartphone than their size of hand had a positive Finkelstein's sign.²⁶

According to a case report of Kentaro Iwata published in 2019 in Japan suggested that a phone relatively larger than the size of the hand is more likely to lead to this De Quervain's Disease. Thumb, a shorter than other fingers, might not reach corners of wider display and it could lead to development of tenosynovitis.²⁸ In current study the individuals using thumb (61.3%) for sliding on the smartphone have more incidence of De Quervain's Disease as compared to individuals using fingers (0.00%).

A study done by Bashar Reada et.al in 2020 comparing the degree of pain between the dominant hand and non-dominant hand out of 233 participants who had a positive Finkelstein's sign, 112 (48%) reported that the pain was more intense in the dominant hand.²⁶ Whereas in the current study found to be 65 (56.03%). The present study has shown that the NPRS of dominant hand is more than the non-dominant hand. The present study has revealed that individuals who are positive for Finkelstein test has significant association with mild difficulty in daily activities such as 14 (12.06%) students has difficulty in pinching, 13 (11.2%) has difficulty in gripping and 11 (9.4%) has difficulty in typing on keyboard. We also found that 19 (16.38%) has mild difficulty in thumb movement who were positive for Finkelstein test.

In the current study frequency of De Quervain's disease is significantly associated with the number of text messages per day, as number of text messages increases the incidence of positive Finkelstein's test increases from 45.2% in (< 50 text messages) to 61.5% who are texting (50-100 text messages) to 64.01% (100-200 text messages) and 86.9% (> 200 text messages). We compared our data with those of similar studies. Eapan et al. detected that increased text messaging and greater prevalence of Finkelstein's test.²⁹ In the current study out of 116 students, 30 (25.86%) students has reported thumb/wrist pain these values are close to the study done by Ayman Baabdullah et al. who found that 20.4% participants had pain in the thumb/wrist.¹⁵ Our study revealed that 69 (59.48%) participants were using mobile phone for internet browsing and the next frequent answer was texting 21(18.10%) participants.

We also found a significant association of duration of smartphone usage and positive Finkelstein's test. 4 (12.9%) students are using smartphone less than 4 hour, 20 (46.5%) students are using between 5-7 hours, 20 (95.2%) students are using more than 10 hours. In a study of Bashar Reada et.al the correlation between the positive Finkelstein's sign and duration of phone use, showed that 38 (57%) of those who used their phone for ≤ 6 hours, 118 (67%) of those who used their phone for 6-8 hours, and 77 (81%) of those who used their phone for > 8 hours had a positive Finkelstein's sign.²⁶ The difference between the groups was significant ($p=0.003$). A study done by Vicente Aleixandre in (2020) in Peru found an association between having occasional or frequent problematic smartphone use with a higher prevalence of DQT symptomatology, assessed by the Finkelstein test and found association between the number of hours per day of smartphone use and prevalence of DQT.³⁰

Due to chronic overuse repetitive gripping, grasping or wringing of the objects can cause inflammation of the tendons and the tendon sheaths which narrows the first dorsal compartment limiting motion of the tendons. If left untreated, the inflammation and progressive narrowing stenosis can lead to scarring that further limits thumb motion.^{31,32}

In this present study male students have shown slightly more prevalence of De Quervain's Disease than female by 6% which is not of much difference. As the population is homogeneous but still there is some heterogenicity therefore there is difference in results obtained. It shows that the part of the population cannot be ruled for the occurrence of the De Quervain's Disease and should take all necessary ergonomic improvements, precautions etc. to minimize its risk of injury and improving habit.

CONCLUSION

In this study the prevalence of De Quervain's Disease was found to be 56.03% of participants had a positive Finkelstein's sign. Our study shown that this population cannot be ruled out for its predisposition towards developing DQ.

We found significant association of almost all the factors associated with mobile phone use with Finkelstein test.

CLINICAL IMPLICATION

This research will advise mobile phone users to text with both hands and make short texts, instead of using the thumb for texting, hold the mobile phone in one hand and use the other fingers of the other hand for using the mobile phone, give support to the forearm while typing, not to type too fast and take periodic breaks in between.

SUGGESTIONS AND LIMITATION

Our study provides an insight into the prevalence of De Quervain's Disease and its relationship with the overuse of mobile phones based on several other factors associated with mobile phone use. However, data concerning the position of hand during usage of mobile phones, general everyday habits, hobbies, how the phone is usually carried and used and weight of the phone should have been collected. Also, Information about the use of other devices, such as personal computers and tablets, and how often they were used should have been collected.

Further studies should be done with a larger sample size. Only the Finkelstein test is performed for diagnosis of De Quervain's Disease.

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