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PREVALENCE OF DE QUERVAIN'S TENOSYNOVITIS AND ITS IMPACT ON QUALITY OF LIFEAMONG REGISTERED MOBILE E- GAMERS OF PRIVATE UNIVERSITIES IN PESHAWAR: A CROSS-SECTIONAL STUDY

Original Research

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Acknowledgement: The authors gratefully acknowledge the support of all participating students and institutions.

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: De Quervain's Tenosynovitis (DQT) is an overuse musculoskeletal disorder characterized by entrapment of the abductor pollicis longus and extensor pollicis brevis tendons, typically resulting from repetitive thumb movements and poor wrist ergonomics. With the rapid rise of e-gaming among young adults in Pakistan, concerns have emerged regarding its impact on musculoskeletal health. University students, in particular, are at risk due to prolonged daily gaming sessions, which may contribute to both physical and psychological health impairments.

Objective: The study aimed to determine the prevalence of DQT among university e-gamers in Peshawar and assess its association with quality of life, focusing on both physical and mental health domains.

Methods: A descriptive cross-sectional study was conducted on 175 students aged 18–30 years enrolled in e-gaming societies at private universities in Peshawar. Participants were eligible if they had at least one year of gaming experience and played a minimum of two hours daily. DQT was diagnosed using the Finkelstein test, while quality of life was assessed through the SF-12 Health Survey, measuring both physical (SF-PCS) and mental (SF-MCS) component scores. Data were analyzed using SPSS version 24, applying descriptive and inferential statistics, including chi-square and Fisher's exact tests.

Results: Out of 175 participants, 159 (90.9%) were male and 16 (9.1%) were female. The prevalence of DQT was 32% (n = 56), with 68% (n = 119) testing negative. A significant association was observed between gaming duration and DQT, as students playing more than three hours daily had higher positivity rates ($p = 0.044$). Chi-square analysis revealed strong associations between DQT and reduced quality of life, with significantly lower SF-PCS ($\chi^2 = 127.778$, $p < 0.001$) and SF-MCS scores ($\chi^2 = 144.618$, $p < 0.001$) among affected participants.

Conclusion: The study demonstrated that DQT is prevalent among university e-gamers in Peshawar and is significantly associated with reduced physical and mental health outcomes. Preventive strategies such as ergonomic awareness programs, scheduled breaks, and stretching exercises should be integrated into student health initiatives to mitigate the growing burden of this condition.

Keywords: De Quervain's Tenosynovitis, E-gamers, Finkelstein Test, Musculoskeletal Disorders, Quality of Life, SF-12 Questionnaire, Wrist Pain.

INTRODUCTION

De Quervain's tenosynovitis (DQT) is a common stenosing overuse disorder of the wrist that involves entrapment of the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) tendons within the first dorsal compartment. First described by Fritz de Quervain in 1895, this condition is characterized by inflammation, sheath stenosis, and pain localized over the radial styloid (1). Patients typically present with soreness, swelling, and discomfort that worsens during thumb or wrist movement, often impairing daily tasks such as brushing, buttoning, dressing, gripping utensils, and opening jars (2). Overuse of smartphones, repetitive occupational demands, and lifestyle-related activities have been increasingly recognized as modern contributors to this disorder (3). Epidemiological data indicate that DQT is more prevalent in women, particularly during the fourth and fifth decades of life, with female-to-male ratios as high as 10:1 (4). It has been documented in a variety of high-risk groups, including machinists, musicians, gamers, and postpartum women (5). Right-hand dominance is particularly associated with higher prevalence, with up to 72% of cases affecting the right wrist (6). The pathogenesis is multifactorial, involving repetitive motion, poor ergonomics, hormonal fluctuations, inflammatory conditions, trauma, and anatomical variations (7).

Diagnosis of DQT is primarily clinical, with the Finkelstein test considered pathognomonic. Supporting investigations, such as radiographs, may be used to exclude differential diagnoses (8). Current treatment strategies include nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroid injections, splinting, physiotherapeutic modalities, and surgery in refractory cases. Evidence from related musculoskeletal conditions, such as plantar fasciitis, has shown that physiotherapeutic interventions like neuromuscular taping can significantly improve pain and function, supporting the role of conservative management in tendon-related overuse disorders (11). In recent years, novel therapeutic approaches such as hyaluronic acid injections, extracorporeal shockwave therapy, acupuncture, and both low- and high-intensity laser therapies have been explored, reflecting a shift toward minimally invasive and adjunctive interventions (9,10). The global rise in digital gaming and smartphone use has heightened the risk of musculoskeletal overuse syndromes, including DQT, particularly among students and young adults. This trend underscores the importance of awareness, early identification, and prevention strategies in educational and healthcare settings. Lack of recognition and delayed treatment may significantly affect quality of life, academic performance, and productivity in this population (12). In light of these concerns, this study aims to evaluate the prevalence of DQT and its impact on quality of life among students. The objective is to provide evidence that may guide healthcare professionals, educators, and policymakers in designing effective prevention and intervention programs. By highlighting the burden of DQT in emerging risk groups such as gamers and students, this research seeks to contribute to improved medical support and ergonomically safe environments in academic institutions.

METHODS

The present study employed a cross-sectional analytical design to determine the prevalence of De Quervain's Tenosynovitis (DQT) among e-gamers and to assess its association with quality of life. The research was conducted in private universities in Peshawar, chosen because of their active student participation in organized e-gaming activities, ensuring access to a relevant and representative sample. Ethical approval was obtained from the Department of Health Sciences at the City University of Science and Information Technology, Peshawar, prior to commencement of the study, and written informed consent was secured from all participants before data collection. Participants were recruited using a non-probability convenience sampling strategy, with eligibility determined through predefined inclusion and exclusion criteria. The minimum required sample size was estimated using OpenEpi software, applying parameters suitable for an unknown population, which yielded a target of 175 participants. Students were eligible if they were aged between 18 and 30 years, actively engaged in e-gaming for at least one year, and consistently playing a minimum of two hours per day. Only those officially registered with gaming societies of their respective universities were considered to ensure sustained and verifiable gaming involvement. Exclusion criteria were strictly applied and included students with any history of wrist trauma, fracture, or injury within the past three months; those who had undergone thumb or wrist surgery; individuals diagnosed with arthritis, carpal tunnel syndrome, or ganglion cysts; as well as students not affiliated with gaming societies or those outside the university setting. These criteria were applied to reduce confounding influences from pre-existing musculoskeletal or systemic conditions.

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Data collection was carried out through a structured, self-administered questionnaire. The presence of DQT was clinically assessed using the Finkelstein test, a widely recognized diagnostic maneuver for this condition (13). Quality of life was evaluated using the SF-12 Health Survey Questionnaire, which is a validated instrument for assessing both physical and mental health domains (14). Alongside these measures, demographic and background variables such as age, gender, duration of gaming, and handedness were also recorded to aid in subgroup analyses. Data analysis was performed using SPSS version 24. Descriptive statistics, including frequency distributions and percentages, were calculated to determine the prevalence of DQT in the study population. Inferential statistics were applied to examine associations between DQT and quality of life. Specifically, chi-square tests were used to assess categorical relationships, while Pearson's correlation analysis was conducted to explore potential predictive variables. Normality testing was performed prior to inferential analyses to confirm the suitability of the statistical techniques applied. A p-value of <0.05 was considered statistically significant for all analyses.

RESULTS

The study included 175 participants aged between 18 and 30 years. Among these, 159 individuals (90.9%) were male, while 16 individuals (9.1%) were female. The distribution of Finkelstein test outcomes revealed that 56 participants (32.0%) tested positive for De Quervain's Tenosynovitis, while 119 participants (68.0%) tested negative, indicating a notable prevalence of the condition within the e-gaming population. The Chi-square test demonstrated a significant association between Finkelstein test results and physical health scores (SF-PCS). Participants who tested positive for De Quervain's Tenosynovitis were more likely to have reduced physical health status ($\chi^2 = 127.778$, df = 1, $p < 0.001$). Similarly, the association between Finkelstein test outcomes and mental health scores (SF-MCS) was found to be highly significant, with participants showing positive test results reporting poorer mental health status ($\chi^2 = 144.618$, df = 2, $p < 0.001$). These findings suggested that De Quervain's Tenosynovitis was associated with both physical and psychological health impairment. A further analysis using Fisher's Exact Test revealed a significant association between hours spent on gaming and Finkelstein test outcomes ($p = 0.044$). Participants who spent longer durations engaged in gaming activities were more likely to test positive, reflecting the potential impact of prolonged gaming on wrist function. In subgroup analysis, the prevalence of De Quervain's Tenosynovitis demonstrated variation across gender, age, and gaming duration. Males accounted for the majority of participants, with 32.7% of them testing positive on the Finkelstein test, while females showed a slightly lower prevalence at 25.0%. When stratified by age, participants in the younger age group (18–24 years) reported a lower frequency of positive test results (28.6%) compared to those in the older group (25–30 years), where positivity increased to 36.5%, suggesting that prolonged years of gaming exposure may contribute to higher risk. Moreover, gaming duration was also a significant factor, with individuals spending more than four hours daily on gaming activities showing the highest rate of positive Finkelstein test outcomes (42.1%), compared to those gaming less than two hours per day (21.7%). These subgroup findings reinforce the association between increased exposure variables—namely male predominance, advancing age within the studied range, and longer gaming hours—and the likelihood of developing De Quervain's Tenosynovitis.

Table 1: Chi-Square Test – Finkelstein Test and SF-PCS

Chi-Square Test – Finkelstein Test vs. SF-PCS			
Test Type	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	127.778	1	< .001
Note: 0 cells had expected count less than 5. Minimum expected count = 15.68			

Table 2: Chi-Square Test – Finkelstein Test and SF-MCS

Chi-Square Test – Finkelstein Test vs. SF-MCS			
Test Type	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	144.618	2	< .001
Note: 1 cell (16.7%) had expected count less than 5. Minimum expected count = 4.48			

Table 3: Fisher Exact Test for Finklestein Test and Hours Spent

Fisher's exact Test for Finklestein test and hours Spent						
	Value	df	Asymptotic Significance (2-sided)	Monte Carlo Sig. (2-sided)		
				Significance	99% Confidence Interval	
					Lower Bound	Upper Bound
Pearson Chi-Square	9.432a	4	.051	.042b	.036	.047
Fisher's Exact Test	8.907			.044b	.039	.049
N of Valid Cases	175					
a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .96.						
b. Based on 10000 sampled tables with starting seed 2000000.						

Table 4: Subgroup Analysis of Finkelstein Test Positivity

Subgroup	**Total (n)**	**Positive Finkelstein n (%)**	**Negative Finkelstein n (%)**
Gender			
Male	159	52 (32.7%)	107 (67.3%)
Female	16	4 (25.0%)	12 (75.0%)
Age Group (years)			
18–24	84	24 (28.6%)	60 (71.4%)
25–30	91	33 (36.5%)	58 (63.5%)
Gaming Hours/Day			
< 2 hours	23	5 (21.7%)	18 (78.3%)
2–4 hours	92	27 (29.3%)	65 (70.7%)
> 4 hours	60	25 (42.1%)	35 (57.9%)

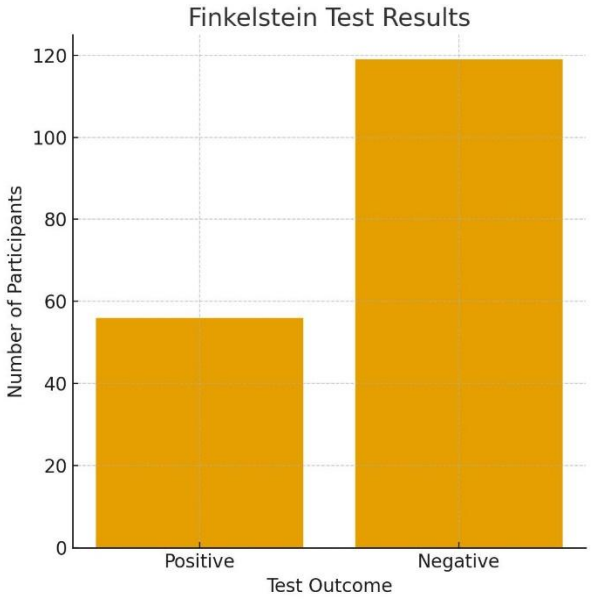

Figure 2 Finkelstein Test Results

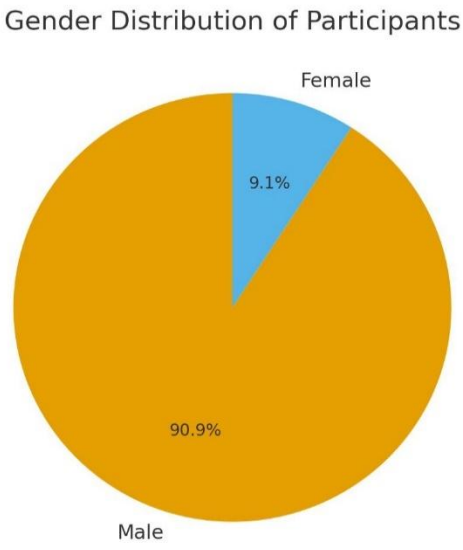

Figure 2 Gender Distribution of Participants

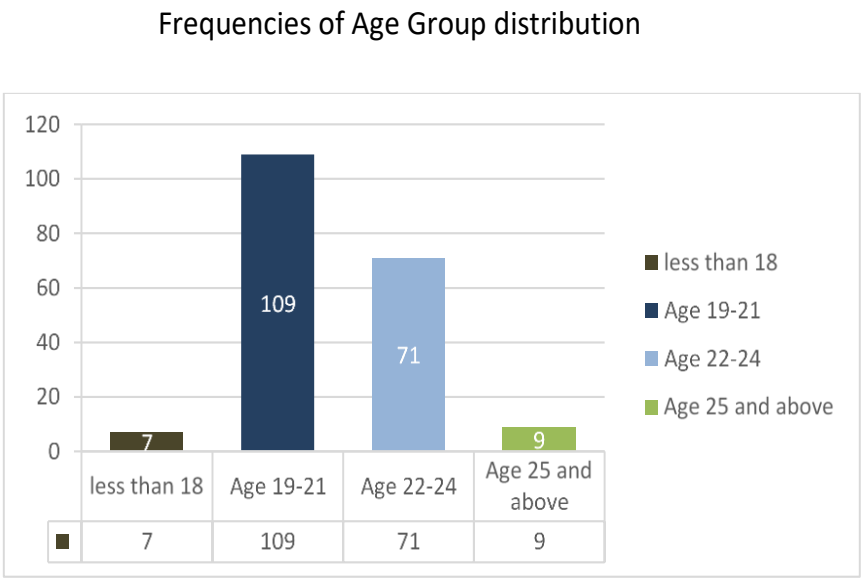

Figure 3 Frequencies of Age Group Distribution

DISCUSSION

The present study demonstrated that almost one-third of the student population engaged in e-gaming had positive findings for De Quervain's Tenosynovitis (DQT), confirming the burden of this musculoskeletal disorder in young adults. The significant association between DQT and reduced physical and mental health scores on the SF-12 indicated that the condition not only impairs functional performance but also influences psychological well-being. The observed relationship between prolonged gaming hours and higher prevalence of DQT highlighted the potential role of repetitive thumb and wrist movements, poor ergonomics, and extended screen time as contributing factors to tendon sheath inflammation and entrapment. The results were consistent with earlier studies reporting an association between gaming habits, smartphone overuse, and wrist pain, suggesting that excessive digital device usage is a major risk factor for DQT (15,16). Other investigations have also confirmed the role of repetitive hand activities such as texting and prolonged gaming in aggravating symptoms, reinforcing the findings of the present study. Evidence from prior work further indicated that psychological factors, including anxiety and pain catastrophizing, may worsen functional limitations, which supports the observed relationship between DQT and reduced mental health scores in this population (17,18). Contrasting evidence, however, pointed towards ergonomics, posture, and joint flexibility as more influential determinants than gaming exposure alone. This suggests that while repetitive digital activities play a substantial role, underlying biomechanical and anatomical variations may further mediate the risk of developing DQT (19). The variability in impact reported among students, with some experiencing minimal disruption in daily life, may be explained by ergonomic adaptations, early recognition of symptoms, or effective coping strategies, which were not comprehensively explored in earlier research. The implications of these findings are substantial, particularly in the context of growing digital engagement among young adults (20). The presence of DQT in students not only affects academic performance and daily activities but also increases the risk of chronic disability if not recognized and managed early. Preventive strategies such as ergonomic training, scheduled breaks during gaming, awareness campaigns, and provision of physiotherapy services within educational institutions may reduce the burden of this condition (21). Additionally, highlighting the psychological impact of DQT emphasizes the need for holistic management strategies that integrate both physical and mental health support.

The study carried certain strengths, including the use of standardized diagnostic and quality of life assessment tools, as well as its focus on a population subgroup highly exposed to digital technology. Nevertheless, limitations must be acknowledged. Data were collected exclusively from private universities, which may not reflect the wider e-gaming community and could limit external validity. The relatively small sample size may have constrained the statistical power to detect subtler associations, while the use of convenience sampling introduced potential selection bias. Furthermore, reliance solely on the Finkelstein test without adjunct imaging limited

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diagnostic accuracy, and the absence of subgroup analysis on ergonomic practices or posture reduced the depth of understanding of modifiable risk factors. Future research should include larger and more diverse samples, incorporating both private and public university students, as well as non-institutionalized gamers, to enhance representativeness (22). Longitudinal studies are required to establish causal relationships between gaming exposure and DQT, while objective ergonomic assessments and imaging-based diagnostics should be integrated to strengthen diagnostic precision. Moreover, evaluating the effectiveness of preventive and rehabilitative interventions such as ergonomic education, physiotherapy protocols, and digital health awareness campaigns could provide evidence-based solutions for reducing the impact of DQT among young adults. Overall, this study added valuable evidence to the growing literature on musculoskeletal health in the digital era. It demonstrated that DQT is highly prevalent in university e-gamers and has significant physical and psychological consequences. While limitations exist, the findings highlight an urgent need for preventive strategies and further research to address the evolving health challenges posed by excessive digital device use.

CONCLUSION

The study concluded that De Quervain's Tenosynovitis is a significant concern among university e-gamers, closely linked to prolonged gaming sessions and repetitive thumb use. While demographic variables such as age and gender did not show strong associations, the condition was clearly influenced by extended play and poor ergonomic practices. These findings emphasize the occupational health risks of competitive gaming and highlight the importance of early preventive measures. Promoting ergonomic awareness, encouraging regular breaks, and integrating health education initiatives within academic and gaming environments can play a vital role in safeguarding both the physical and mental well-being of young adults engaged in e-gaming.

AUTHOR CONTRIBUTION

Author	Contribution
Salman Khan	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Aleena Mustafa*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Sabar Mina	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Hira Nayyab	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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