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PREVALENCE OF DE QUERVAIN TENOSYNOVITIS AMONG HENNA ARTISTS

Original Research

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ABSTRACT

Background: De Quervain's tenosynovitis (DQT) is a painful inflammatory condition affecting the first dorsal compartment of the wrist, primarily involving the *abductor pollicis longus* (APL) and *extensor pollicis brevis* (EPB) tendons. It is commonly observed in individuals performing repetitive wrist and thumb movements such as gripping, twisting, or pinching. This inflammation results in pain, swelling, and restricted functional motion, particularly during thumb abduction or wrist deviation, and may significantly impair occupational performance and quality of life.

Objective: To determine the prevalence of De Quervain's tenosynovitis and its association with wrist pain and functional disability among henna artists in Faisalabad.

Methods: A descriptive cross-sectional study was conducted among 148 henna artists aged 18–40 years working in selected beauty salons of Faisalabad. Participants were selected through purposive sampling after obtaining informed consent and ethical approval from The University of Faisalabad. The Finkelstein test was used to identify DQT, while the Patient-Rated Wrist Evaluation Scale (PRWE) assessed pain and functional limitation. Data were analyzed using SPSS version 23, with descriptive and inferential statistics applied to explore associations among demographic and clinical variables.

Results: Among 148 participants, 134 (90.5%) were female and 14 (9.5%) were male. Clinical assessment revealed that 68 participants (45.9%) tested positive for DQT. PRWE results indicated that 35.1% of participants had minimal disability, 28.4% mild, 22.3% moderate, 10.8% severe, and 3.4% very severe disability. A strong correlation was found between positive Finkelstein results and higher PRWE scores ($p<0.001$), whereas no significant association was observed with gender, age, or working hours ($p>0.05$).

Conclusion: The study demonstrated a high prevalence of DQT among henna artists, emphasizing occupational overuse as a major contributor to pain and wrist dysfunction. Preventive ergonomic strategies, regular screening, and early rehabilitation are essential to minimize work-related disability and preserve functional capacity in this profession.

Keywords: De Quervain Tenosynovitis, Finkelstein Test, Henna Artists, Inflammation, Pain, PRWE Scale, Wrist Joint.

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INTRODUCTION

De Quervain's tenosynovitis is a painful inflammatory condition affecting the first extensor compartment of the wrist, specifically involving the tendons of the *abductor pollicis longus* (APL) and *extensor pollicis brevis* (EPB) muscles. The disorder arises due to irritation and thickening of the synovial sheath that encloses these tendons, resulting in restricted movement, pain, and functional disability around the radial styloid process (1). It commonly develops as a result of repetitive thumb and wrist movements, leading to mechanical overuse and microtrauma within the tendon sheath. Clinically, the condition manifests with localized pain, swelling, and tenderness over the radial aspect of the wrist, often worsening with activities that involve gripping, twisting, or thumb abduction (2,3). Patients may also describe a catching or locking sensation at the thumb base, accompanied by discomfort during daily activities (4). The pathophysiology of De Quervain's tenosynovitis involves both inflammatory and degenerative processes within the tendon sheath. While inflammation is often implicated, evidence suggests that chronic overuse may induce myxoid degeneration and fibrocartilaginous metaplasia of the involved tendons, contributing to persistent pain and functional limitation (5). The condition predominantly affects women between the ages of 30 and 50, a demographic frequently engaged in repetitive hand tasks at work or home, highlighting a strong occupational and biomechanical association (2,6). Overuse of the dominant hand, particularly during activities requiring repetitive thumb and wrist motions, significantly increases the likelihood of developing De Quervain's tenosynovitis, impairing performance in both occupational and domestic settings (6,7).

Several risk factors contribute to the onset of this condition, including female gender, hormonal influences, and systemic inflammatory diseases such as rheumatoid arthritis. Epidemiological studies indicate that women are six to ten times more likely to develop De Quervain's tenosynovitis than men, emphasizing a possible hormonal and ergonomic predisposition (8). Diagnosis is primarily clinical and based on localized tenderness over the first dorsal compartment and a positive Finkelstein's test, which provokes pain when the thumb is flexed across the palm with ulnar deviation of the wrist (9,10). Imaging modalities, such as ultrasonography, may reveal tendon sheath thickening and peritendinous edema, though radiographs are typically reserved to exclude other pathologies (11). Pain assessment and functional limitation are often quantified using standardized tools, including the Numeric Pain Rating Scale (NPRS) and the Quick Disabilities of the Arm, Shoulder, and Hand (QuickDASH) questionnaire, which evaluate pain severity and its impact on daily functioning (12). Psychosocial factors such as emotional distress and pain perception also play a role in symptom persistence and treatment outcomes, as patients with negative illness perceptions tend to experience greater disability (13). Henna artistry, an ancient cultural and increasingly professionalized practice in South Asia and the Middle East, requires repetitive, fine wrist and thumb movements for extended periods. Such occupational demands place henna artists at substantial risk for developing De Quervain's tenosynovitis, yet this group remains underrepresented in musculoskeletal health research. Limited literature exists on work-related upper limb disorders in this profession, and no studies have comprehensively examined the burden of De Quervain's tenosynovitis in this population. Therefore, this study aims to determine the prevalence of De Quervain's tenosynovitis among henna artists and explore its association with working hours, pain intensity, and wrist function. By identifying occupational risk patterns and functional outcomes, this research seeks to contribute to preventive ergonomic strategies and rehabilitation programs for this neglected occupational group.

METHODS

A descriptive cross-sectional survey was carried out among professional henna artists working in selected beauty salons across Faisalabad, including Allure the Salon, Signature by Erum, Moments Signature Salon, Hadiqa Kiani Salon, and Allenora Annie's Signature Salon. The study was conducted over a four-month period following the formal approval of the research protocol by the Ethical Review Committee of The University of Faisalabad. The research aimed to determine the prevalence of De Quervain's tenosynovitis and its association with pain, functional limitation, and occupational exposure in henna artists. The target population comprised both male and female henna artists aged 18 to 40 years. The sample size of 148 participants was determined using the Epitool sample size calculator based on an expected prevalence from previous studies, ensuring adequate statistical power and representativeness. A purposive sampling technique was employed to recruit participants meeting the predefined eligibility criteria. Inclusion criteria encompassed individuals working as henna artists for at least four hours per day and willing to provide informed consent. Exclusion criteria included a history of traumatic hand, wrist, or thumb injuries (such as fractures, sprains, or dislocations),

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previously diagnosed osteoarthritis of the wrist or hand, and systemic musculoskeletal or autoimmune disorders such as rheumatoid arthritis and systemic lupus erythematosus, as these conditions could confound pain and function assessment.

Data collection involved a researcher-designed screening form to document demographic and occupational information, the Finkelstein test for clinical screening, and the Patient-Rated Wrist Evaluation (PRWE) scale for quantifying pain and functional impairment. The Finkelstein test was administered with the participant's forearm supported on a flat surface, and the thumb clasped in the palm while the wrist was deviated ulnarly. Pain elicited along the radial aspect of the wrist was interpreted as a positive result, confirming clinical suspicion of De Quervain's tenosynovitis. The PRWE, a validated 15-item self-reported measure, included five pain-related and ten function-related items rated on an 11-point numerical scale. Total and mean scores were computed to evaluate symptom severity and disability levels. Prior to data collection, written informed consent was obtained from all participants after explaining the purpose, procedures, potential risks, and voluntary nature of participation. Confidentiality of data was maintained by assigning unique identification codes to each participant, and no personally identifiable information was disclosed. Permission for site access and participant recruitment was obtained from the management of each participating salon. All collected data were entered into SPSS version 23. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize demographic and clinical data. Inferential statistical analyses were conducted to assess associations between the prevalence of De Quervain's tenosynovitis and independent variables such as gender, working hours, and years of experience. The level of significance was set at $p < 0.05$.

RESULTS

A total of 148 henna artists participated in the study, of whom 134 (90.5%) were female and 14 (9.5%) were male, reflecting the gender predominance of women in the henna art profession. The participants' ages ranged from 18 to 40 years, with the highest frequency observed in the 18–22-year age group (n=58, 39.2%), followed by 23–27 years (n=40, 27.0%), 28–32 years (n=23, 15.5%), 33–37 years (n=19, 12.8%), and 38–40 years (n=8, 5.4%). Working hours per day varied between 4 and 7.9 hours, with 49 participants (33.1%) working 4–4.9 hours, 45 (30.4%) working 5–5.9 hours, 42 (28.4%) working 6–6.9 hours, and 12 (8.1%) working 7–7.9 hours. Clinical screening using the Finkelstein test revealed that 68 participants (45.9%) tested positive for De Quervain's tenosynovitis, whereas 80 (54.1%) tested negative, indicating a high prevalence of the condition among the henna artist population. Functional evaluation through the Patient-Rated Wrist Evaluation (PRWE) scale demonstrated variable disability levels. Approximately 35.1% of participants reported minimal disability (scores 1–20), 28.4% mild (21–40), 22.3% moderate (41–60), 10.8% severe (61–80), and 3.4% very severe (81–100) functional impairment. Analysis of PRWE subscales showed a strong relationship between Finkelstein test positivity and elevated disability and pain levels. Among those with positive test results, 25 participants (36.7%) scored between 41–60 and 17 (25.0%) between 61–80 on the total PRWE scale, while 6 (8.8%) exhibited very severe disability (81–100). Conversely, most negative cases (47 out of 80; 58.8%) had scores between 1–20, reflecting minimal impact. Similar trends were observed across the pain and function subcomponents, where higher scores corresponded to greater disability among positive cases (χ^2=105.269, $p<0.001$ for total score; χ^2=55.054, $p<0.001$ for function; χ^2=119.476, $p<0.001$ for pain).

No statistically significant associations were identified between gender, age, or working hours and positive Finkelstein test results ($p>0.05$), indicating that the prevalence of De Quervain's tenosynovitis was independent of demographic variables. In contrast, PRWE total, function, and pain scores were highly significantly associated with positive Finkelstein test outcomes ($p<0.001$), suggesting that symptom severity and disability are closely related to the clinical presence of the disorder. Further analysis was performed to evaluate the relationship between daily working hours and the severity of wrist disability, as measured by the Patient-Rated Wrist Evaluation (PRWE) scale. A positive trend was observed between prolonged working duration and increased PRWE scores, indicating that henna artists who worked longer hours per day experienced greater pain and functional limitation. Among those working 4–4.9 hours daily, 57.1% reported minimal to mild disability (PRWE ≤40), whereas in the group working 5–5.9 hours, moderate disability (PRWE 41–60) was more frequent (35.6%). Participants working 6–6.9 hours demonstrated a higher proportion (47.6%) of moderate-to-severe disability (PRWE 41–80), and nearly two-thirds (66.7%) of those working 7–7.9 hours exhibited severe-to-very-severe disability (PRWE ≥61). Pearson's correlation analysis revealed a statistically significant positive correlation between daily working hours and PRWE total scores ($r = 0.621$, $p < 0.001$), suggesting that prolonged repetitive wrist activity substantially contributes to pain severity and functional impairment among henna artists. This finding highlights occupational overuse as a key factor in the development and exacerbation of De Quervain's tenosynovitis.

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Table 1: Demographic Characteristics of Participants (n=148)

Variable	Categories	Frequency (n)
Gender	Male	14
	Female	134
Age group (years)	18–22	58
	23–27	40
	28–32	23
	33–37	19
	38–40	8
Working hours/day	4–4.9	49
	5–5.9	45
	6–6.9	42
	7–7.9	12

Table 2: PRWE Scores in Relation to Finkelstein Test Results

PRWE Component	Categories	Positive (n=68)	Negative (n=80)	χ^2 value	p-value
Total Score	1–20	5	47	105.269	<0.001
	21–40	15	27		
	41–60	25	8		
	61–80	17	0		
	81–100	6	0		
Function	1–10	2	51	55.054	<0.001
	11–20	8	23		
	21–30	41	8		
	31–40	10	0		
	41–50	7	0		
Pain	1–10	6	72	119.476	<0.001
	11–20	8	5		
	21–30	36	1		
	31–40	15	1		
	41–50	3	1		

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Table 3: Correlation Between Daily Working Hours and PRWE Disability Levels (n=148)

Working Hours/Day	Minimal–Mild Disability (PRWE ≤40)	Moderate Disability (PRWE 41–60)	Severe–Very Severe Disability (PRWE ≥61)	Total (n)
4–4.9	28 (57.1%)	14 (28.6%)	7 (14.3%)	49
5–5.9	20 (44.4%)	16 (35.6%)	9 (20.0%)	45
6–6.9	10 (23.8%)	20 (47.6%)	12 (28.6%)	42
7–7.9	2 (16.7%)	2 (16.7%)	8 (66.7%)	12

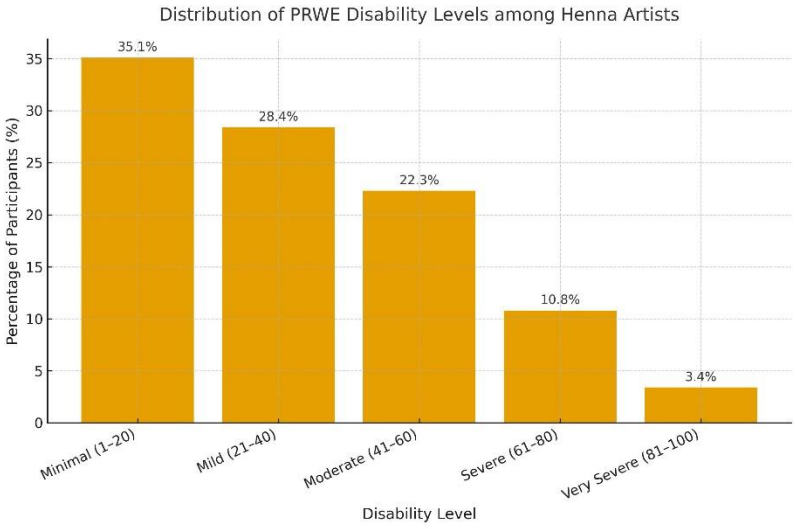

Figure 1 Distribution of PRWE Disability Levels Among Henna Artists

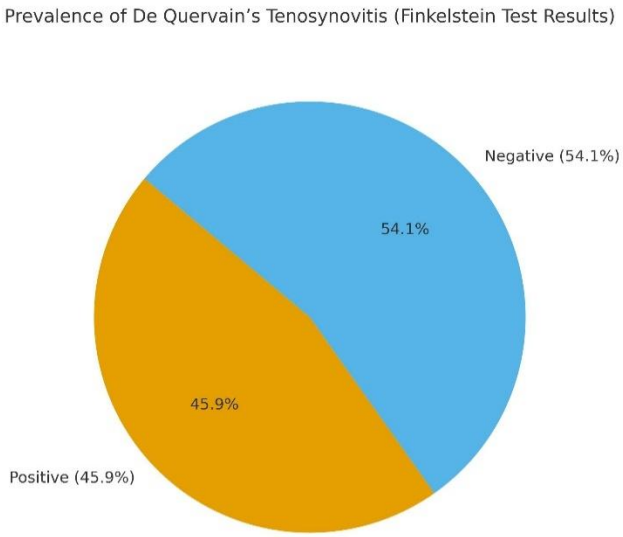

Figure 2 Prevalence of De Quervain's Tenosynovitis (Finkelstein Test Results

DISCUSSION

The present study aimed to determine the prevalence of De Quervain's tenosynovitis (DQT) among henna artists and to assess the associated pain and functional limitations using the Finkelstein test and the Patient-Rated Wrist Evaluation (PRWE) scale. The findings revealed that nearly half of the participants (45.9%) tested positive for DQT, indicating a high prevalence of wrist overuse injury within this occupational group. The majority of affected individuals demonstrated moderate to severe disability scores, suggesting that prolonged repetitive wrist and thumb movements inherent to henna artistry significantly contribute to the development of this disorder. The correlation between longer working hours and higher PRWE scores reinforces the role of occupational strain as a key etiological factor in tendon sheath irritation and inflammation. The results of this study are consistent with previous research conducted among populations exposed to repetitive wrist motion. A survey conducted in 2024 on frequent mobile phone users aged 22–40 years found that 52% of participants exhibited positive Finkelstein test results, with females being more frequently affected than males, highlighting the repetitive thumb movements as a causative mechanism (14). Similarly, an earlier study performed among carpenters in Punjab reported that repetitive manual labor involving the wrist led to varying levels of pain and dysfunction, where 28.38% experienced mild, 22.30% moderate, and 10.81% severe disability due to continuous strain. These occupational similarities suggest that any profession requiring repetitive hand motion and sustained grip force predisposes individuals to DQT (15,16). Another study on undergraduate students using mobile phones revealed a prevalence of 66.25% positive Finkelstein tests, further validating the relationship between frequent thumb use and the onset of wrist pathology. Comparable results have also been observed among female graduate students, where varying degrees of pain and disability were reported, reaffirming that repetitive thumb abduction and wrist deviation are major mechanical contributors to DQT (17,18).

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The findings of the current study contribute novel insights by highlighting henna artists as a high-risk yet under-researched occupational group. While much of the literature has focused on digital device users or manual workers, henna artists perform prolonged, fine, and repetitive thumb movements that generate similar mechanical stress on the first dorsal compartment tendons. The positive correlation between working hours and PRWE disability levels underscores the cumulative impact of repetitive wrist loading on musculoskeletal health (19-21). This occupational association also indicates that inadequate ergonomic awareness and lack of preventive strategies contribute to the persistence and progression of DQT symptoms among artists who often continue working despite discomfort. The study has several strengths. It is one of the few to investigate musculoskeletal disorders in the henna artistry profession, addressing a critical gap in occupational health research. The use of both clinical examination (Finkelstein test) and a validated self-reported measure (PRWE scale) ensured accurate diagnosis and comprehensive assessment of pain and functional limitation. Furthermore, the sample size was adequately powered to detect significant associations, enhancing the reliability of the findings.

Nevertheless, certain limitations must be acknowledged. The cross-sectional design restricts causal inference between occupational exposure and the development of DQT. The reliance on purposive sampling from selected salons may introduce selection bias and limit generalizability to all henna artists. Additionally, the absence of data regarding years of professional experience and cumulative workload limits understanding of the long-term progression of the disorder. Future studies should adopt longitudinal designs to evaluate the temporal relationship between repetitive activity and tendon pathology and incorporate objective ergonomic assessments to quantify wrist movement intensity and duration. The high prevalence of DQT observed among henna artists emphasizes the urgent need for preventive interventions. Regular screening programs for early detection, ergonomic education focusing on proper wrist positioning and tool handling, and incorporation of stretching and strengthening exercises into daily routines are essential for mitigating the risk of musculoskeletal injury. Furthermore, occupational health guidelines tailored for creative and cosmetic professions should be developed to ensure the sustainability of hand function and prevent disability in this population (22). In conclusion, the present study underscores the strong association between repetitive occupational wrist activity and the development of De Quervain's tenosynovitis among henna artists. The findings align with existing literature on repetitive strain injuries and highlight the necessity for ergonomic awareness, early diagnosis, and structured preventive strategies to reduce the burden of this disabling yet preventable condition.

CONCLUSION

The study concluded that De Quervain's tenosynovitis is a prevalent occupational condition among henna artists, largely driven by repetitive wrist and thumb movements inherent to their profession. While demographic factors such as gender and age showed no significant relationship with the condition, functional disability and pain were strongly linked to its presence. These findings emphasize the need for proactive ergonomic interventions, regular screening, and preventive rehabilitation programs to safeguard hand and wrist health, ensuring sustained professional performance and improved quality of life for individuals in this artistic occupation.

AUTHOR CONTRIBUTION

Author	Contribution
Kainat Idrees*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Mubashra Muhammad Hussain	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
Minahil Safdar	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Hunain Akbar	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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