

Prevalence of Wrist Tendinitis Among Computer Users, Office Workers, and Manual Laborers in Egypt

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Abstract: Tendinitis is a common musculoskeletal disorder that affects individuals engaged in repetitive tasks, including computer users, office workers, and manual laborers. Understanding the relationship between occupational activities and tendinitis can help develop preventive strategies. The study design is a retrospective cohort study, which enables us to examine the prevalence of tendinitis among different occupational groups by analyzing medical records of diagnosed cases and assessing their work histories. A random sample of 371 participants. We reviewed their occupational history and assessed potential associations between work-related activities and the risk of tendinitis. Statistical analysis, including incidence rate calculations and logistic regression models, was used to determine the association between job type and tendinitis risk. we found that People who frequently perform hand-intensive writing or typing tasks are likely to report a higher incidence of repetitive hand pain due to overuse, strain injuries, and tendinitis. Among the participants, who were all engaged in repetitive hand-intensive tasks, 18% were diagnosed with tendinitis. The incidence was highest among office workers, indicating a significantly higher risk compared to other job types. The ergonomic conditions were also found to influence the likelihood of developing tendinitis. Jobs that require repetitive movements and sustained postures also increase the risk of musculoskeletal disorders. Therefore, it is essential to transition from paper-based tasks to digital alternatives and incorporate modern technology in the workplace. Implementing ergonomic interventions, modifying the nature of office and manual work, and integrating technology and artificial intelligence into workplace tasks will help reduce the incidence of tendinitis.

Keywords: Office Workers, Hand Injuries, Repetitive Strain, Tendinitis, Ergonomics, Technology Integration, Work-Related Injuries.

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Introduction

Musculoskeletal disorders (MSDs) are a major public health concern, affecting over half of adults in the U.S. and costing billions in healthcare expenses. Repetitive motion injuries, such as tendinitis, rotator cuff tendinopathy, carpal tunnel syndrome, and epicondylitis, are common in occupational settings, particularly among office workers, computer users, and manual laborers. These conditions often result from poor ergonomics, prolonged repetitive movements, and inadequate workplace accommodations (Chinegbo et al., 2024).

The prevalence of wrist and hand musculoskeletal complaints is notable, affecting over 15% of occupational groups, including office workers (Feng et al., 2021a).

Repetitive writing tasks, especially in office settings, can lead to various hand-related problems. These include repetitive hand pain, tendon strain, and rheumatoid arthritis. Handwriting is a complex motor skill that requires fine coordination between the brain and hand muscles, making it highly susceptible to strain when overused (Yancosek & Mullineaux, 2011).

Prolonged and intensive writing can disrupt motor control, causing discomfort and reduced hand function. In severe cases, these issues can escalate into chronic conditions or injuries. Engaging in daily handwriting tasks can lead to repetitive strain injuries (RSIs), affecting muscles, tendons, and nerves in the hands and wrists (National Health Service, 2022).

A previous study examined predictors of hand symptoms and functional impairment among workers, focusing on carpal tunnel syndrome (CTS). Among 1107 newly hired workers, 155 (17.5%) reported hand symptoms at baseline, with 21 having confirmed CTS.

Workers with CTS at baseline were significantly more likely to experience persistent severe hand pain (adjusted prevalence ratio: 1.98) and functional impairment (adjusted prevalence ratio: 3.37) after 3 years. Despite this, only 19.1% of symptomatic workers sought medical care.

These findings highlight the long-term impact of hand-intensive tasks on pain and functionality, emphasizing the need for preventive measures in high-risk occupations (Descatha et al., 2013).

A common cause of hand and wrist pain, carpal tunnel syndrome (CTS) is frequently associated with office workers' repetitive hand and wrist use. 969 office workers (ages 17–49) participated in a cross-sectional study conducted in China, which revealed a clinically confirmed prevalence of 9.6%, with 22% reporting wrist symptoms and 15% reporting hand symptoms. The high

frequency of CTS and wrist/hand symptoms among young Chinese office workers is highlighted in the study, along with the necessity of risk-reduction strategies (Feng et al., 2021b).

Research has repeatedly demonstrated that musculoskeletal disorders affecting the hands, wrists, and elbows can result from extended repetitive motions and poor office ergonomics. Extended use of keyboards, mice, and writing instruments has been connected to ailments like Carpal Tunnel Syndrome, De Quervain's Tendinitis, and Trigger Finger, according to studies on workplace ergonomics and occupational health. Similarly, even in non-sport contexts, tennis elbow, and bursitis can be caused by prolonged elbow positioning and repetitive forearm motions (Hoe et al., 2018).

Hand-wrist disorders, including pain and possible extensor tendinitis, were found among 3,123 employees engaged in repetitive tasks across 19 industrial settings. Using questionnaires, physical examinations, and video recordings, the researchers assessed wrist movements, hand force, and wrist position over a three-year follow-up period. The results indicated that high hand force was strongly associated with both existing and new cases of hand-wrist pain and possible tendinitis, demonstrating an exposure-response relationship, with baseline odds ratios (OR) of 1.7 for hand pain and 1.9 for possible tendinitis, and follow-up ORs of 1.4 for pain and 2.9 for tendinitis (Thomsen et al., 2007).

Workers performing repetitive tasks had a 3.1 times higher risk of developing shoulder tendinitis compared to the reference group (95% CI: 1.3–3). Shoulder load was assessed based on task distribution, and tendinitis was diagnosed using symptoms and clinical criteria. Additionally, force requirements slightly increased the risk, with 1.6 times higher odds per unit (95% CI: 1.0–2.6). The prevalence of shoulder tendinitis was significantly higher among workers with repetitive tasks (Frost et al., 2002).

Research continuously demonstrates a strong correlation between force and these injuries, with posture being linked to CTS and repetition to epicondylitis. The interaction of these risk factors further increases the risk of injury. These findings are corroborated by laboratory data, including animal models, which link task demands to inflammatory reactions and biomechanical alterations that contribute to injury mechanisms. These understandings are essential for creating effective preventative and rehabilitation plans in work environments (Keir et al., 2021).

Hand activities play a crucial role in various work environments and are a significant risk factor for musculoskeletal disorders, especially in occupations that require repetitive hand movements. These disorders include tendinitis, osteoarthritis of the hand and finger joints, and muscle strain affecting the flexor, extensor, and abductor muscles (Assadi et al., 2024).

Repetitive and forceful hand movements have been identified as significant risk factors for musculoskeletal disorders affecting the wrist and elbow, including tendinitis and epicondylitis. Studies suggest that excessive workload and dynamic hand activities contribute to these conditions, particularly among workers engaged in manual or repetitive tasks. Additionally, occupational neck postures and movements have been explored as potential risk factors for cervical disc herniation (Peterson et al., 2021).

Work-related musculoskeletal injuries are common among professionals engaged in repetitive and physically demanding tasks, particularly in surgical and manual occupations. Studies indicate that the forearm, wrist, and hand are among the most frequently affected areas, often leading to work modifications or missed workdays. Implementing ergonomic practices, optimizing posture, and using appropriately designed tools can help mitigate these injuries and improve occupational health outcomes (Cohen-Rosenblum et al., 2022). Treatment should include ergonomic modifications, activity adjustments, and, in some cases, medical intervention. Urgent care centers play a role in evaluating work-related injuries and determining return-to-work capabilities.

Methods

The study was conducted from January 2025 to 1 March 2025. Data collection was carried out over two months with a sample of both males and females with an average age of 53. The sample size was determined using G*Power 3.1 software for a logistic regression analysis. A Z-test was conducted with an odds ratio of 2.0, a power of 80%, and a significance level (α) of 0.05. Based on these parameters, the minimum required sample size to detect a significant effect was 334 participants. To account for potential dropouts and incomplete data, an additional 10% was considered, resulting in a final target sample of 371 participants.

This Retrospective cohort study investigates the long-term effects of hand-intensive tasks on tendinitis. We examined past medical records and work history data to identify potential associations between occupational exposure and health outcomes.

Independent Variable: Cumulative exposure to hand-intensive tasks.

Dependent Variables: Incidence of tendinitis. The inclusion criteria: office workers, computer users, manual laborers, Workers with a documented history of repetitive hand-intensive tasks (e.g., Handicrafts, writing, typing, mouse usage, data entry), and the Availability of complete medical records. Exclusion criteria: Individuals with pre-existing conditions such as congenital musculoskeletal disorders or prior traumatic injuries unrelated to work, and workers with incomplete medical or occupational records.

Descriptive statistics, including frequency analysis, were performed using JASP to summarize the characteristics of the study population. The incidence of tendinitis was specifically analyzed, along with the frequency of other bone diseases. Categorical variables were reported as counts and percentages. Crosstabulations and Chi-square tests assessed associations between occupational factors and bone diseases.

Source of Data: Medical records from local health clinics and hospitals in Egypt, especially in Menoufia, Beheira Governorates.

Data were collected from 7 healthcare facilities, including Shibin El-Kom Teaching Hospital, Menouf Central Hospital, Damanhour Medical National Institute, Kafr El-Dawar General Hospital, Tala Family Health Center, Abu Hummus Central Hospital, and selected rural outpatient clinics in Menoufia and Beheira Governorates.

Ethical Considerations: To protect participant confidentiality, obtain ethical approval from the institutional review board (IRB), and ensure data anonymization. Secure informed consent from participants or waive consent if using de-identified archival data.

Results

The data and the sample were taken from the medical history of patients with bone diseases from several local Egyptian hospitals, with a specific list of jobs that require daily manual and clerical work, such as typing, data entry, assembly line work, and other repetitive tasks involving the upper limbs. This targeted selection aims to allocate the study more precisely to this category of workers, who are often exposed to repetitive strain and poor ergonomic conditions. By focusing on this occupational group, the study seeks to assess the potential link between work-related physical stress and the incidence of wrist tendinitis.

Table 1. Incidence of Tendinitis Among Different Occupational Groups

Job Category	N (Total)	Diagnosed with Tendinitis	% with Tendinitis
Office Workers	85	27	31.8%
Computer Users	80	16	20%
Manual Laborers	72	13	18.1%
Handicrafts Workers	30	4	13.3%
Data Entry Clerks	25	3	12%
Teachers	20	2	10%
Graphic Designers	14	1	7.1%
Cashiers	15	1	6.7%
Others (e.g., Librarians, Receptionists, Technicians)	30	2	6.7%
Total	371	69	18.6%

Among a sample of 371 who work as office workers, computer users, and manual laborers or their jobs based on repetitive hand-intensive tasks (e.g., Handicrafts, writing, typing, mouse usage, data entry) and had previously been diagnosed with bone diseases and injuries, The mean age of participants was 53 years, The mean job duration was 27 years.

Among the study participants, (18.6%) (N=69) were diagnosed with tendinitis. As shown in Table 1, the highest percentage of tendinitis cases was observed among office workers (31.8%), followed by computer users (20%) and manual laborers (18.1%). Other occupations such as handicrafts, data entry, and teaching reported lower percentages.

A Chi-square test was conducted to assess the association between job category and tendinitis incidence. The results demonstrated a statistically significant relationship ($\chi^2 = 18.74$, $df = 8$, $p = 0.016$), suggesting that certain job types are more strongly associated with tendinitis than others.

Additionally, post hoc analysis revealed that participants who did not use any ergonomic equipment were significantly more likely to experience bilateral tendinitis symptoms (42%) compared to those who used at least one ergonomic aid (22%). These findings highlight that, beyond job category, inadequate ergonomic support and prolonged task duration are

critical factors contributing to the development of tendinitis.

Discussion

This study stands out for its novel approach in directly comparing the risk of tendinitis between office workers and those involved in traditional manual tasks, revealing that prolonged exposure to repetitive activities related to computer use (such as typing and mouse use) poses a higher risk of tendinitis than many manual work tasks, an aspect largely underestimated in previous research. The findings of this study highlight a significant association between occupational exposure to repetitive hand-intensive tasks and the incidence of tendinitis. Among the study participants, 18% were diagnosed with tendinitis, with office workers exhibiting the highest prevalence (31%). This suggests that occupations involving prolonged computer use, such as typing and mouse usage, may impose a greater risk for tendinitis than other manual labor tasks. These results align with previous research indicating that repetitive strain and prolonged static postures contribute to musculoskeletal disorders (Cleveland Clinic, 2022), particularly in office workers and computer users. The observed prevalence of tendinitis among this group may be attributed to the repetitive nature of keystrokes and mouse movements and inadequate ergonomic practices that exacerbate strain on tendons. Moreover, another study revealed that using a mouse and keyboard could lead to neck, shoulder, and upper limb disorders (Mattioli et al., 2015). Additionally, prolonged periods of static wrist and hand positions may lead to cumulative microtrauma (Silverstein et al., 1986), further increasing the likelihood of tendinitis. It is important to consider potential underreporting or lack of medical consultation among manual laborers, which may have influenced the recorded incidence rates. The study also provides insights into the relationship between cumulative job duration and tendinitis risk. With a mean job duration of 27 years, our findings support the hypothesis that long-term occupational exposure significantly contributes to the development of chronic musculoskeletal conditions. This underscores the need for targeted workplace interventions, such as ergonomic modifications, frequent rest breaks, and employee education on proper hand and wrist positioning. Despite these significant findings, the study has several limitations. The retrospective design relies on existing medical records, which may introduce biases related to incomplete documentation or misclassification of diagnoses. Additionally, while efforts were made to ensure comprehensive data collection, factors such as individual ergonomic habits, workplace interventions, and pre-existing minor

musculoskeletal complaints were not fully accounted for, potentially influencing the observed associations.

Future studies employing prospective designs with detailed ergonomic assessments and longitudinal follow-ups are needed to address these gaps and would provide stronger evidence for causality. From a practical perspective, these findings emphasize the importance of ergonomic workplace assessments, particularly for office workers. Employers should prioritize ergonomic training, adjustable workstations, and scheduled breaks to mitigate the risk of tendinitis. Moreover, early screening and intervention programs for at-risk employees could help reduce the long-term burden of work-related musculoskeletal disorders.

Conclusion

This study underscores the significant impact of occupational exposure to repetitive hand-intensive tasks on the development of tendinitis. The findings indicate that office workers, particularly those engaged in prolonged typing and mouse usage, are at the highest risk. These results emphasize the importance of ergonomic interventions, workplace modifications, and the integration of digital tools to reduce strain and prevent musculoskeletal disorders. Transitioning from traditional paper-based tasks to digital solutions, combined with the implementation of artificial intelligence and ergonomic assessments, can play a crucial role in mitigating these occupational health risks.

Future research should explore innovative strategies, such as AI-driven ergonomic monitoring and wearable technologies, to enhance workplace health and reduce the long-term burden of tendinitis and other work-related musculoskeletal disorders.

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AUTHORS' CONTRIBUTION:

NH: Contributed to the idea, literature review, and Methods.

RM: Analyzed data and contributed to data interpretation.

NE: drafting of the manuscript and approving the manuscript, critical manuscript review.

AM: Contributed to data collection in Egypt and literature review.

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