INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

PREVALENCE OF CARPAL TUNNEL SYNDROME IN STENO TYPISTS WORKING IN THE JUDICIARY OFFICE OF ISLAMABAD: A CROSS-SECTIONAL STUDY

Original Research

Javeria Habib[1], Muhammad Faizan Khan[2], Muhammad Abdul Moiz[3], Muhammad Behzad Ali[4], Shahzaib Raza Shah[5], Fiza Rao[6], Maryam Akram[7], Uswa Ali[8], Iqra Khan[9]*.

[1]Physiotherapist, Ali Ahmad Physiocare, Pakistan.
[2]Master in Physiotherapy (Neurological Conditions), University of Antwerp, Belgium.
[3]MSc Sport Rehabilitation, St Mary's University, Twickenham, London, United Kingdom.
[4]Pediatric Physiotherapist, Sounah Al Haya Association, Djibouti, Africa.
[5]Head of Rehabilitation Department, Laeeque Rafiq Institute of Health Sciences, Multan; PhD Scholar, Lincoln College University, Malaysia.
[6]Doctor of Physical Therapy (Graduate from PUMHS), House Officer, Suleman Roshan Medical College and Hospital, Pakistan.
[7]Clinical Physiotherapist, In Motion Rehabilitation Physical Therapy Clinic, Pakistan.
[8]Physical Therapist and Pain Specialist, Owner of Azam Roshan Clinic of Physical Therapy, Pakistan.
[9]Pediatric Physiotherapist, CMH Risalpur, Pakistan.
Corresponding Author: Iqra Khan, Pediatric Physiotherapist, CMH Risalpur, Pakistan, dr.iqrakhan5@gmail.com

Acknowledgement: The authors sincerely acknowledge the support of the Islamabad High Court and Bashir Institute of Health Sciences for granting permission and ethical approval to conduct this research.

Conflict of Interest: None

Grant Support & Financial Support: None

ABSTRACT

Background: Carpal Tunnel Syndrome (CTS) is a common work-related musculoskeletal disorder (WMSD) caused by repetitive wrist motion, prolonged flexion, or sustained pressure on the median nerve within the carpal tunnel. It frequently affects professionals engaged in continuous computer use, leading to pain, numbness, and weakness of the hand. Steno-typists, due to their occupational typing demands, represent a high-risk group for developing CTS, yet local research on this population in Pakistan remains limited.

Objective: The study aimed to determine the prevalence and severity of Carpal Tunnel Syndrome among steno-typists working in the judiciary courts of Islamabad, Pakistan.

Methods: A descriptive cross-sectional study was conducted among 60 steno-typists aged 30–55 years, all working a minimum of six hours daily in the judiciary courts. Participants were selected through non-probability convenient sampling. Data were collected using demographic information, manual diagnostic tests (Phalen's test and Tinel's sign), the Sheffield CTS Diagnostic Questionnaire (SCTSDQ), and the Boston Carpal Tunnel Questionnaire (BCTQ), which included the Boston Symptom Severity Scale (BSSS) and the Boston Functional Status Scale (BFSS). Ethical approval was obtained from the Ethical Review Board of Bashir Institute of Health Sciences, and informed consent was secured from all participants prior to data collection.

Results: Tinel's sign was positive in 30 participants (50%), and Phalen's test was positive in 27 participants (45%), with the highest prevalence in the 35–40-year age group. Based on the SCTSDQ, 8.3% had an unlikely indication, 43.3% a suggestive indication, and 48.3% a strong suggestive indication of CTS. Findings from the BCTQ revealed that 33.3% reported no symptoms, 50% mild symptoms, 15% moderate symptoms, and 1.7% severe symptoms, yielding an overall CTS symptom prevalence of 66.7%.

Conclusion: The study concluded that CTS is significantly prevalent among steno-typists in Islamabad's judiciary sector, primarily due to repetitive typing and prolonged wrist strain. Preventive ergonomic interventions, regular screening, and awareness programs should be implemented to reduce occupational CTS risk.

Keywords: Carpal Tunnel Syndrome, Cross-Sectional Study, Functional Status, Median Nerve, Musculoskeletal Disorder, Occupational Health, Wrist.

INTRODUCTION

Carpal Tunnel Syndrome (CTS) is a common entrapment neuropathy that occurs when the median nerve within the carpal tunnel of the wrist becomes compressed due to skeletal encroachment, inflammation, or thickening of the flexor sheath, leading to characteristic pain and discomfort (1). The clinical manifestations of CTS vary in intensity, ranging from mild to severe, and are primarily characterized by pain and paraesthesia affecting the thumb, index, middle, and radial side of the ring finger, corresponding to the median nerve's sensory distribution (2). Repetitive wrist movements or sustained awkward postures often aggravate these symptoms, making the condition particularly relevant among individuals engaged in occupations requiring continuous hand and wrist activity (3). Two well-established clinical tests, Tinel's sign and Phalen's test, are frequently employed to elicit CTS-related symptoms, although their diagnostic value remains limited. Tinel's sign involves tapping over the median nerve at the wrist to reproduce tingling or pain, while Phalen's test induces symptoms through wrist flexion at shoulder height (4). Despite its often idiopathic nature (5), CTS has been associated with both environmental and medical risk factors. Environmental contributors include prolonged wrist flexion or extension, repetitive motion, and exposure to vibration (6,7), whereas medical risk factors such as rheumatoid arthritis, diabetes mellitus, hypothyroidism, and pregnancy can exacerbate median nerve compression through mechanical and ischemic mechanisms (8,9). CTS represents the most prevalent form of entrapment neuropathy, frequently linked to occupational exposure involving repetitive hand and wrist movements (9). Studies have reported that approximately 55–65% of CTS cases are bilateral, reflecting a possible systemic component (10).

The condition is more prevalent among females, particularly between 40 and 60 years of age, and its incidence varies geographically, with estimates ranging from 7–16% in the United Kingdom to around 5% in the United States (11,12). Occupations that demand sustained typing, gripping, or tool handling—such as clerical and computer-based work—are associated with increased CTS risk due to cumulative micro-trauma from repetitive motions (13,14). In Pakistan, steno-typists, particularly those employed within the judiciary and journalism sectors, represent a high-risk occupational group. Their daily tasks typically involve 6–8 hours of continuous keyboard use, encompassing the transcription of court hearings, remarks, evidence, and judgments (15). Despite the high ergonomic strain and repetitive workload inherent to this profession, there is a paucity of research examining the prevalence and symptom severity of CTS among this specific occupational group. Previous literature has identified a significant association between computer-intensive tasks and CTS, with prevalence among computer professionals reported between 13% and 31% (16–18). However, local data on CTS among steno-typists in Pakistan remain scarce. Given the occupational vulnerability and lack of existing data, this study was designed to determine the prevalence of Carpal Tunnel Syndrome among steno-typists working in judicial offices, while also assessing the severity of symptoms and the degree of functional limitations experienced.

METHODS

This cross-sectional study was conducted among 60 steno-typists aged between 30 and 55 years, employed in the judiciary courts of Islamabad. Participants were selected through non-probability convenient sampling from both the East and West wings of the Islamabad District Courts, following formal authorization from the Islamabad High Court. The inclusion criteria comprised steno-typists with a minimum of six working hours per day and at least one year of continuous employment. Individuals with any history of cervical radiculopathy, recent wrist fracture, rheumatoid arthritis, diabetes mellitus, thyroid dysfunction, or pregnancy were excluded through a preliminary screening procedure. Participation was entirely voluntary, and all individuals were informed of their right to withdraw from the study at any time without consequence. The study objectives and procedures were explained in detail, ensuring full confidentiality of personal data. Ethical approval was obtained from the Ethical Review Board (ERB) of Bashir Institute of Health Sciences, Islamabad and written permission for data collection was granted by the Islamabad High Court. Prior to data collection, written informed consent was obtained from each participant, and copies of the ethical approval and permission letters were included in the appendices. Initially, the Spurling test was performed manually on each participant to rule out cervical radiculopathy, ensuring adherence to the exclusion criteria. This test involved controlled cervical compression and was conducted under safe conditions to prevent discomfort or injury. Following this, the Phalen's test was administered by instructing participants to maintain wrist flexion at shoulder level to assess for symptom provocation. Subsequently, the Tinel's sign was evaluated by gently tapping over the median nerve from the index finger

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

towards the elbow to elicit tingling or pain. Both procedures were performed bilaterally under direct observation to ensure uniformity and reliability of testing.

After the completion of manual tests, participants were instructed to complete two standardized diagnostic questionnaires: the Sheffield Carpal Tunnel Syndrome Diagnostic Questionnaire (SCTSDQ) and the Boston Carpal Tunnel Questionnaire (BCTQ). The SCTSDQ is a concise tool designed to identify the presence of CTS-related symptoms such as pain, numbness, and tingling during day or night. A score of less than 3 indicated an unlikely presence of CTS, 3–4 suggested possible CTS, and a score above 5 denoted a strong indication of the condition. The BCTQ, a disease-specific and validated instrument, comprised two subscales: the Boston Symptom Severity Scale (BSSS) and the Boston Functional Status Scale (BFSS). The BSSS included 11 items assessing the severity and frequency of CTS symptoms over the past two weeks, while the BFSS contained 8 items evaluating functional limitations in daily activities, such as gripping, dressing, or handling objects. Responses were rated on a five-point Likert scale, where higher scores reflected greater symptom severity and functional impairment. The collected data were analyzed using IBM SPSS (Statistical Package for the Social Sciences) version 26. Age was categorized into five subgroups for comparative assessment, and cross-tabulations were performed with gender and symptom severity variables. Descriptive statistics, including frequencies and percentages, were used to summarize participant characteristics and diagnostic outcomes. Results from both manual tests and questionnaires were compared across age subgroups. Graphical representation of the data was achieved through clustered bar charts to illustrate the prevalence of CTS relative to age and gender.

RESULTS

Out of 60 steno-typists enrolled in the study, 27 participants (45%) were within the age group of 30–35 years, 17 (28.3%) were aged 36–40 years, 10 (16.7%) were aged 41–45 years, 2 (3.3%) were aged 46–50 years, and 4 (6.7%) were aged 51–55 years. The Tinel's sign test was positive in 30 participants (50%), while Phalen's test was positive in 27 participants (45%). The highest frequency of positive test responses was observed in the 35–40 years age group, indicating a potential correlation between increased CTS prevalence and this occupationally active age bracket. Findings from the Sheffield Carpal Tunnel Syndrome Diagnostic Questionnaire (SCTSDQ) revealed that 8.3% of participants had an unlikely indication of CTS, 43.3% demonstrated a suggestive indication, and 48.3% showed a strong suggestive indication of CTS. The majority of these cases were concentrated in the 35–40-year age group, consistent with the outcomes of manual diagnostic tests. Regarding symptom severity based on the Boston Symptom Severity Scale (BSSS), 33.3% of participants reported no symptoms, 50% reported mild symptoms, 15% reported moderate symptoms, and 1.7% reported severe symptoms. This distribution reflected an overall CTS symptom prevalence of approximately 66.7% among the studied population. Night-time wrist pain was reported by 26.7% of participants, while nocturnal numbness was observed in 33.4%, suggesting that discomfort during rest periods was a common manifestation of CTS symptoms. Functional limitations assessed through the Boston Functional Status Scale (BFSS) indicated that 50% of participants reported no difficulty in daily activities, 48.3% experienced mild functional limitations, and 1.7% experienced moderate difficulty. The most frequent mild functional limitation occurred in the 35–40-year age group, mirroring the pattern observed in both clinical and diagnostic questionnaire findings. To strengthen the analytical depth of the study, an additional assessment was performed to evaluate gender-based differences and the relationship between age, symptom severity, and functional limitations. Among the total 60 participants, 37 (61.7%) were male and 23 (38.3%) were female. The prevalence of CTS symptoms based on the Boston Symptom Severity Scale (BSSS) was slightly higher among females (73.9%) compared to males (62.1%). Similarly, mild-to-moderate functional limitations, as indicated by the Boston Functional Status Scale (BFSS), were more frequently reported by female participants (56.5%) than males (46.0%). The age group of 35–40 years showed the highest cumulative CTS prevalence in both sexes, accounting for 41.2% of all positive findings. Chi-square testing revealed a statistically non-significant but notable association between gender and CTS symptom severity ($\chi^2 = 1.89$, $p = 0.17$), suggesting a trend toward greater symptom burden among females. These findings align with existing literature describing higher CTS susceptibility in females, potentially due to hormonal and anatomical factors influencing the carpal tunnel's structural dimensions (9, 11).

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Table 1: Frequency and % of the Cumulative scores of BSSS shown in 4 categories

Scale		Frequency	Percent
Valid	(1-11) = No symptoms	20	33.3
	(12-22) = Mild symptoms	30	50.0
	(23-33) = Moderate symptoms	9	15.0
	(34-44) = Severe symptoms	1	1.7
	Total	60	100.0

Table 2: Frequency and % of the Cumulative scores of BFSS shown in 3 categories

Scale		Frequency	Percent
Valid	(1-8) = No difficulty	30	50.0
	(9-16) = Little difficulty	29	48.3
	(17-24) = Moderate difficulty	1	1.7
	Total	60	100.0

Table 3: Distribution of CTS Symptom Severity (BSSS) and Functional Limitation (BFSS) by Gender

Gender	**n (%)**	**BSSS Mild-to-Severe Symptoms n (%)**	**BFSS Mild-to-Moderate Limitation n (%)**	**CTS Prevalence (SCTSDQ Suggestive + Strong) n (%)**
Male	37 (61.7)	23 (62.1)	17 (46.0)	25 (67.5)
Female	23 (38.3)	17 (73.9)	13 (56.5)	19 (82.6)
Total	60 (100)	40 (66.7)	30 (50.0)	44 (73.3)

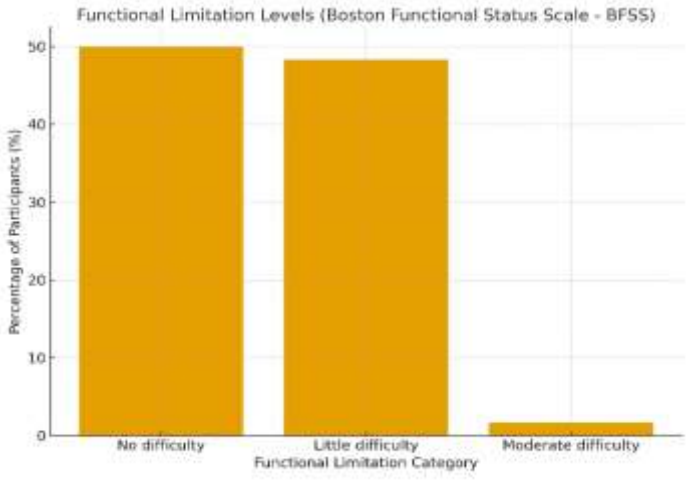


Figure 2 Functional Limitation Levels (Boston Functional Status Scale – BFSS)

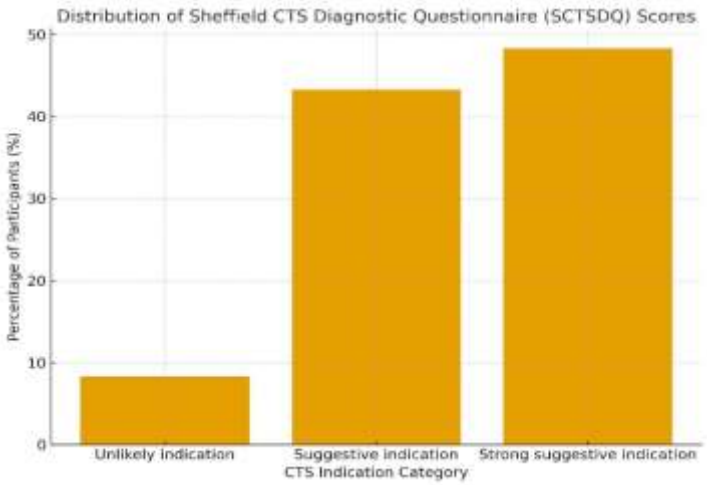
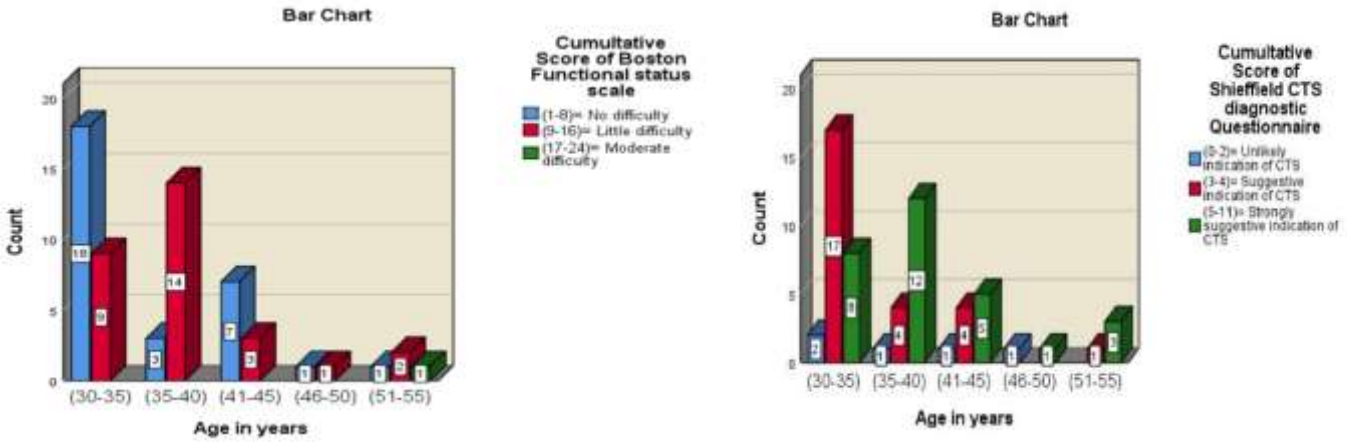


Figure 2 Distribution of Sheffield CTS Diagnostic Questionnaire (SCTSDQ) Scores

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION



DISCUSSION

The current study explored the association between prolonged computer use among steno-typists in judiciary courts and the prevalence of Carpal Tunnel Syndrome (CTS). The findings demonstrated a considerably higher prevalence of CTS compared to most reported studies on computer professionals. According to the diagnostic questionnaire outcomes, 43.3% of the participants exhibited a suggestive indication, and 48.3% a strong suggestive indication of CTS. When assessed through the Boston questionnaire, 66.7% of participants reported symptoms consistent with CTS. These values are notably higher than those reported in prior investigations on computer professionals, where the prevalence ranged between 13% and 31% (17). The elevated prevalence in the current study may be attributed to the continuous and intense nature of keyboard use required of steno-typists, who engage in uninterrupted transcription before, during, and after court hearings. Comparable findings have been reported in studies assessing CTS prevalence among computer-based employees, particularly within the 31–35-year age range (18). However, the present study found the highest prevalence among participants aged 35–40 years. This difference may reflect the onset of degenerative musculoskeletal changes that gradually predispose individuals in this age bracket to repetitive strain neuropathies. Occupational exposure characterized by repetitive wrist flexion, forceful typing, and static hand postures further compounds the risk of developing CTS, particularly among middle-aged professionals. The findings from the Boston Symptom Severity Scale (BSSS) and the Boston Functional Status Scale (BFSS) revealed that 50% of participants experienced mild symptoms and 15% reported moderate symptoms, while 1.7% suffered severe symptoms. Functionally, 48.3% of participants reported mild limitations and 1.7% reported moderate limitations in daily activities. These results align closely with previous research conducted on computer operators in Pakistan, which also identified mild symptom severity as the predominant category (19,20). However, the current study recorded higher rates of nocturnal pain (26.7%) and numbness (33.4%) compared to previously reported findings of approximately 15–16% (21). The higher frequency of sleep disturbances in the present cohort reinforces the impact of sustained wrist strain caused by prolonged and uninterrupted typing sessions, which are more characteristic of stenographic work than general computer operation.

Manual diagnostic testing further corroborated the questionnaire-based findings, with 50% of participants exhibiting a positive Tinel's sign and 45% a positive Phalen's test. These results markedly exceeded those reported in earlier studies on computer users, where only 11.1% and 10% tested positive, respectively (22). The higher proportion of positive manual test findings in this study may be reflective of the higher CTS prevalence obtained through subjective scales, highlighting the occupational vulnerability of steno-typists due to repetitive micro-trauma and cumulative wrist stress. Despite these strong findings, several methodological limitations must be acknowledged. The study's reliance on manual tests and self-reported questionnaires rather than nerve conduction studies (NCS), which serve as the diagnostic gold standard, may have introduced bias and potential over- or underestimation of CTS prevalence. The small number of female participants also limited gender-based comparisons, primarily due to their underrepresentation in district court stenographic roles. Furthermore, institutional restrictions prevented inclusion of steno-typists from the High Court and Supreme Court, constraining the generalizability of findings to the broader stenographic population. Nevertheless, this study carries significant strength in addressing a previously unexplored occupational cohort within Pakistan's judicial sector. By combining manual assessments with standardized CTS diagnostic instruments, it provided a multidimensional evaluation of symptom severity and functional limitations. The consistency of findings across different assessment tools reinforces the reliability of the observed prevalence. Future research should

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

incorporate larger, more diverse samples with proportional gender representation and utilize electrodiagnostic confirmation to enhance diagnostic precision (23). Longitudinal designs assessing the progression of CTS symptoms and ergonomic intervention outcomes would further enrich understanding of occupational neuropathies in repetitive-motion professions. The current findings underscore the urgent need for preventive ergonomic measures, regular screening, and workplace modifications to mitigate CTS risk among high-exposure occupational groups such as steno-typists.

CONCLUSION

The present study concluded that Carpal Tunnel Syndrome is notably prevalent among steno-typists working in the judiciary sector, primarily as a result of prolonged and repetitive keyboard use during extended working hours. Although the majority of cases were identified at the mild stage, the findings highlight an important occupational health concern that warrants early attention to prevent progression toward more severe neuropathic involvement. The study emphasizes the need for ergonomic modifications in workplace design, regular screening programs, and awareness initiatives to promote healthier wrist and hand posture during computer work. Implementing these preventive strategies within judicial and similar office environments could significantly reduce the burden of CTS and improve the overall well-being and productivity of computer-based professionals.

AUTHOR CONTRIBUTION

Author	Contribution
Javeria Habib	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Muhammad Faizan Khan	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
Muhammad Abdul Moiz	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Muhammad Behzad Ali	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Shahzaib Raza Shah	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Fiza Rao	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Maryam Akram	Contributed to study concept and Data collection Has given Final Approval of the version to be published
Uswa Ali	Writing - Review & Editing, Assistance with Data Curation
Iqra Khan*	Writing - Review & Editing, Assistance with Data Curation

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

REFERENCES

1. Tabatabaeifar S, Dalbøge A. Carpal tunnel syndrome and occupational hand exposures: a Danish nationwide cohort study. Occup Environ Med. 2024;81(8):417-24.

2. Cooke R, Lawson I, Gillibrand S, Cooke A. Carpal tunnel syndrome and Raynaud's phenomenon: a narrative review. Occup Med (Lond). 2022;72(3):170-6.

3. Curti S, Ginanneschi F, Salce C, Argentino A, Mattioli S, Mondelli M. Carpal tunnel syndrome severity and work: a case-control study. Occup Med (Lond). 2025;75(1):26-32.

4. Hall S, Compton MR. Common Occupational Upper Extremity Musculoskeletal Disorders. Am Fam Physician. 2025;111(5):451-8.

5. Threesittidath K, Chaibal S, Nitayarak H. Effects of 1-hour computer use on ulnar and median nerve conduction velocity and muscle activity in office workers. J Occup Health. 2024;66(1).

6. Tilley PM, Mulla DM, Keir PJ. Effects of sex and age on work-related upper extremity musculoskeletal disorders in Ontario, Canada. Work. 2023;75(3):1009-20.

7. Maghsoudipour M, Hosseini F, Coh P, Garib S. Evaluation of occupational and non-occupational risk factors associated with carpal tunnel syndrome in dentists. Work. 2021;69(1):181-6.

8. Battista EB, Yedulla NR, Koolmees DS, Montgomery ZA, Ravi K, Day CS. Manufacturing Workers Have a Higher Incidence of Carpal Tunnel Syndrome. J Occup Environ Med. 2021;63(3):e120-e6.

9. Çupi B, Šarac I, Jovanović JJ, Jovanović S, Petrović-Oggiano G, Debeljak-Martačić J, et al. Occupational and non-occupational risk factors correlating with the severity of clinical manifestations of carpal tunnel syndrome and related work disability among workers who work with a computer. Arh Hig Rada Toksikol. 2022;74(4):252-72.

10. Rotaru-Zavaleanu AD, Lungulescu CV, Bunescu MG, Vasile RC, Gheorman V, Gresita A, et al. Occupational Carpal Tunnel Syndrome: a scoping review of causes, mechanisms, diagnosis, and intervention strategies. Front Public Health. 2024;12:1407302.

11. Stjernbrandt A, Vihlborg P, Wahlström V, Wahlström J, Lewis C. Occupational cold exposure and symptoms of carpal tunnel syndrome - a population-based study. BMC Musculoskelet Disord. 2022;23(1):596.

12. Masci F, Spatari G, Giorgianni CM, Antonangeli LM, D'Arrigo A, Biasina AM, et al. Occupational hand and wrist disorders among forestry workers: An exposed-control study to investigate preventive strategies. Work. 2022;72(4):1249-57.

13. Harris-Adamson C, Eisen EA, Kapellusch J, Hegmann KT, Thiese MS, Dale AM, et al. Occupational risk factors for work disability following carpal tunnel syndrome: a pooled prospective study. Occup Environ Med. 2022;79(7):442-51.

14. Johanning E, Stillo M, Landsbergis P. Powered-hand tools and vibration-related disorders in US-railway maintenance-of-way workers. Ind Health. 2020;58(6):539-53.

15. Feng B, Chen K, Zhu X, Ip WY, Andersen LL, Page P, et al. Prevalence and risk factors of self-reported wrist and hand symptoms and clinically confirmed carpal tunnel syndrome among office workers in China: a cross-sectional study. BMC Public Health. 2021;21(1):57.

16. Singh AD, Aggarwal N, Mohan BP, Madhu D, Song G, Bhatt A, et al. Prevalence of endoscopy-related injuries and their impact on clinical practice: a systematic review and meta-analysis. Endoscopy. 2024;56(8):612-9.

17. Ben Said H, Kaabi K, Kerkeni N, Youssef I, Mechergui N, Brahim D, et al. The Professional Future in Operated Carpal Tunnel Syndrome: A Cross-Sectional Study of Recognized Occupational Cases. Med Lav. 2023;114(4):e2023031.

18. Nuckols TK, Dworsky M, Conlon C, Robbins M, Benner D, Seabury S, et al. The quality of occupational healthcare for carpal tunnel syndrome, healthcare expenditures, and disability outcomes: A prospective observational study. Muscle Nerve. 2023;67(1):52-62.

19. Keir PJ, Farias Zuniga A, Mulla DM, Somasundram KG. Relationships and Mechanisms Between Occupational Risk Factors and Distal Upper Extremity Disorders. Hum Factors. 2021;63(1):5-31.

20. Zimmerman M, Nilsson P, Rydberg M, Dahlin L. Risk of hand and forearm conditions due to vibrating hand-held tools exposure: a retrospective cohort study from Sweden. BMJ Open. 2024;14(6):e080777.

21. Eros FR, Demers PA, Sritharan J. Sex-differences in the risk of carpal tunnel syndrome: results from a large Ontario, Canada worker cohort. BMC Musculoskelet Disord. 2024;25(1):1098.

22. Kapellusch JM, Bao SS, Malloy EJ, Thiese MS, Merryweather AS, Hegmann KT. Validation of the Revised Strain Index for Predicting Risk of Incident Carpal Tunnel Syndrome in a Prospective Cohort. Ergonomics. 2021;64(11):1369-78.

23. Aagaard TH, Biering K, Vestergaard JM, Willert MV, Kyndi M. Work Participation in Patients With Carpal Tunnel Syndrome Referred to Departments of Occupational Medicine-A Danish Register-Based Cohort Study. Am J Ind Med. 2025;68(4):321-30.