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Prevalence of Carpal Tunnel Syndrome Among Administrative Staff at the University of Tripoli: A Cross-Sectional Study

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انتشار متلازمة النفق الرسغي بين الموظفين الإداريين في جامعة طرابلس: دراسة مقطعية

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Abstract

Background: Carpal Tunnel Syndrome (CTS) is one of the most common peripheral neuropathies, resulting from compression of the median nerve at the wrist. It represents an important occupational health concern, particularly among office employees exposed to prolonged computer use and repetitive hand activities. Despite increasing international evidence, data regarding CTS among office workers in Libya remain limited.

Objective: This study aimed to determine the prevalence of CTS-related symptoms and to examine their association with demographic and occupational factors among administrative staff at the University of Tripoli.

Methods: A cross-sectional analytical study was conducted among 162 administrative employees selected using probability-based sampling. Data were collected through a standardized questionnaire assessing demographic characteristics, occupational exposure, CTS-related symptoms, functional manifestations, and symptom modifiers. CTS severity was classified into mild, moderate, and severe categories based on questionnaire scoring. Statistical analysis was performed using descriptive statistics and Chi-square tests, with statistical significance set at $p < 0.05$.

Results: CTS-related symptoms were commonly reported among participants, with 40.7% experiencing nocturnal wrist pain and 38.0% reporting nocturnal tingling or numbness. Mild CTS constituted the largest proportion of cases (46.7%), followed by moderate (36.7%) and severe CTS (16.6%). Female gender, increasing age, and combined manual and computer-based work were significantly associated with the presence of CTS symptoms ($p < 0.05$). Symptoms during daily activities were reported by 61.1% of participants, whereas improvement with wrist splint use was observed in only 26%.

Conclusion: CTS represents a notable occupational health burden among administrative employees at the University of Tripoli. Female gender, older age, and prolonged computer use were identified as significant associated factors. These findings highlight the importance of early screening programs, ergonomic workplace interventions, and preventive occupational health strategies to reduce the risk and impact of CTS.

Keywords: Carpal Tunnel Syndrome, Office Workers, Tripoli University, Occupational Health, Symptoms.

الملخص

الخلفية : تُعد متلازمة النفق الرسغي (CTS) من أكثر اعتلالات الأعصاب الطرفية شيوعًا، وتنجم عن انضغاط العصب المتوسط عند مستوى الرسغ. وتمثل مشكلة مهمة في مجال الصحة المهنية، خاصة بين موظفي المكاتب المعرضين للاستخدام المطول للحاسوب والحركات اليدوية المتكررة. وعلى الرغم من تزايد الأدلة الدولية، لا تزال البيانات المتعلقة بمتلازمة النفق الرسغي بين العاملين في المكاتب في ليبيا محدودة.

الهدف : هدفت هذه الدراسة إلى تحديد مدى انتشار أعراض متلازمة النفق الرسغي ودراسة ارتباطها بالعوامل الديموغرافية والمهنية بين الموظفين الإداريين في جامعة طرابلس.

المنهجية : أُجريت دراسة تحليلية مقطعية شملت 162 موظفًا إداريًا تم اختيارهم باستخدام أسلوب المعاينة الاحتمالية. جُمعت البيانات من خلال استبيان موحد لتقييم الخصائص الديموغرافية، والتعرضات المهنية، والأعراض المرتبطة بمتلازمة النفق الرسغي، والمظاهر

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الوظيفية، والعوامل المؤثرة في الأعراض. وتم تصنيف شدة المتلازمة إلى خفيفة ومتوسطة وشديدة بناءً على نتائج الاستبيان. أُجري التحليل الإحصائي باستخدام الإحصاء الوصفي واختبار مربع كاي، مع اعتبار مستوى الدلالة الإحصائية عند قيمة $p < 0.05$.
النتائج : كانت الأعراض المرتبطة بمتلازمة النفق الرسغي شائعة بين المشاركين، حيث أفاد 40.7% بوجود ألم في الرسغ أثناء الليل، و38.0% بحدوث تنميل أو خدر ليلي. شكّلت الحالات الخفيفة النسبة الأكبر (46.7%)، تلتها الحالات المتوسطة (36.7%) ثم الحالات الشديدة (16.6%). وُجد ارتباط ذو دلالة إحصائية بين ظهور الأعراض وكلٍّ من الجنس الأنثوي، والتقدم في العمر، والعمل الذي يجمع بين الجهد اليدوي واستخدام الحاسوب ($p < 0.05$). كما أبلغ 61.1% من المشاركين عن ظهور الأعراض أثناء الأنشطة اليومية، بينما لوحظ تحسن مع استخدام جبيرة الرسغ لدى 26% فقط.
الخلاصة : تمثل متلازمة النفق الرسغي عبئًا مهنيًا ملحوظًا بين الموظفين الإداريين في جامعة طرابلس. وقد تم تحديد الجنس الأنثوي، والتقدم في العمر، والاستخدام المطول للحاسوب كعوامل مرتبطة مهمة. وتؤكد هذه النتائج أهمية برامج الفحص المبكر، والتدخلات المريحة في بيئة العمل، والاستراتيجيات الوقائية في مجال الصحة المهنية للحد من مخاطر وتأثيرات المتلازمة.

الكلمات المفتاحية : متلازمة النفق الرسغي، موظفو المكاتب، جامعة طرابلس، الصحة المهنية، الأعراض.

Introduction

Carpal Tunnel Syndrome (CTS) is one of the most common peripheral nerve disorders, caused by compression of the median nerve at the wrist. It is typically characterized by pain, tingling, numbness, and weakness of the hand, which may negatively interfere with daily functioning and work productivity. CTS has been widely recognized as an important occupational health condition, particularly among workers exposed to repetitive hand movements and prolonged static postures (Dale et al., 2023).

Office employees represent a population at increased risk of developing CTS due to prolonged computer use, repetitive keyboard activities, and suboptimal ergonomic conditions. Recent evidence indicates that sustained computer-based tasks are associated with upper limb musculoskeletal disorders, including CTS-related symptoms, especially when combined with poor workstation design (Bortolotti et al., 2024).

Several studies have demonstrated that occupational biomechanical factors, such as repetitive wrist movements and forceful hand activities, significantly increase the risk of CTS (Dale et al., 2023; Nordander et al., 2025). In addition, female gender and increasing age have consistently been identified as important non-occupational risk factors (Fan et al., 2024).

Despite the growing body of international research, data regarding CTS among office employees in Libya remain scarce. Therefore, this study aimed to assess the prevalence of CTS-related symptoms and to examine their association with demographic and occupational factors among office staff at the University of Tripoli.

Material and Methods

One hundred sixty-two participants were included in a cross-sectional analytical study conducted among administrative staff at the University of Tripoli to monitor the prevalence and occurrence of Carpal Tunnel Syndrome (CTS). Participants were selected using a probability-based sampling method. Demographic data, occupational characteristics, and daily symptoms were collected using a standardized questionnaire. A consent form explaining all research procedures and potential issues was provided to each participant. Participation was completely voluntary.

Ethical approval was obtained from the University of Tripoli Scientific Committee. Of the participants, 46.3% were males and 53.7% were females, with ages ranging from 20 to 60 years. All assessments were performed by trained personnel following a uniform protocol to minimize inter-observer variability. Statistical analysis was conducted using descriptive methods, with results expressed as means, standard deviations, frequencies, and percentages. A p-value < 0.05 was considered statistically significant.

Statistical Analysis

Data were analyzed using a descriptive–analytical approach. Descriptive statistics were used to summarize the demographic characteristics of the participants and the distribution of Carpal Tunnel Syndrome (CTS)–related symptoms. Associations between CTS symptoms and demographic or occupational variables were examined using the Chi-square test. Statistical significance was considered at a p-value of less than 0.05.

Results and Discussion

Demographic and Occupational Characteristics of the Participants

A total of 162 participants were included in this study. Female participants were considered the majority of the study population, representing slightly more than half. The most frequent age group of the participants was 20–30 years, accounting for more than 40%, followed by 30–40 and 40–50 years at approximately 22% each. Regarding the type of occupational daily exposure, a combination of manual and computer-based work was the most commonly reported type of daily activity, reported by 63%, while a smaller proportion reported computer-only or manual-only activities at 23% and 14%, respectively. The demographic characteristics and described activities are reported in Table 1.

Table 1. Demographic characteristics of the study participants (n = 162).

Symptom	Response	n	%
Wrist pain waking at night	Yes	(66)	40,7%
	No	(96)	59,3%
Tingling/numbness waking at night	Yes	(62)	38%
	No	(100)	62%
Tingling/numbness worse in the morning	Yes	(54)	33,3%
	No	(108)	66,7%

Nocturnal symptoms associated with carpal tunnel syndrome (CTS) were commonly reported among the participants. A notable proportion, with 40% of the respondents having wrist pain, severe enough attempts to wake them at night. Moreover, tingling and numbness during sleep were frequently reported, with many participants noting increased symptom severity during the early morning hours. The associated symptoms were commonly reported among participants in Table 2.

Table 2. Prevalence of CTS-associated Symptoms.

Symptom	Response	n	%
Wrist pain waking at night	Yes	(66)	40,7%
	No	(96)	59,3%
Tingling/numbness waking at night	Yes	(62)	38%
	No	(100)	62%
Tingling/numbness worse in the morning	Yes	(54)	33,3%
	No	(108)	66,7%

Functional Manifestations and Activity-Associated Symptoms

In addition, many participants reported that their symptoms appeared or worsened during routine daily activities such as using a mobile phone, driving, writing, or reading. Several employees indicated that they performed specific hand or wrist movements during symptom episodes to relieve numbness or discomfort. On the other hand, tingling or numbness in the little finger was reported but was less common. Wrist splints were used for pain relief, with noted improvement in only a small proportion of participants. Functional symptoms related to hand use are summarized in Table 3.

Table 3. Functional and activity-associated symptoms.

Item	Response	n	%
Symptom relief with hand movements	Yes	(73)	44.4%
	No	(90)	55.6%
Symptoms during daily activities	Yes	(101)	61.1%
	No	(63)	38.9%
Tingling in little finger	Yes	(34)	20%
	No	(131)	80%

Associated clinical factors are summarized in Table 4. Neck pain was reported by a proportion of the participants. Among female respondents, symptom severity during pregnancy was reported in a limited number of cases. Use of a wrist splint resulted in symptom improvement and relief in only a small proportion of participants.

Table 4. Associated factors and symptom modifiers.

Variable	Response	n	%
Neck pain	Yes	(90)	55.4%
	No	(72)	44.6%
Severe symptoms during pregnancy	Yes	(24)	14.8%
	No	(138)	85.2%
Improvement with wrist splint	Yes	(42)	26%
	No	(120)	74%

CTS Diagnostic Classification

Based on the questionnaire scoring system, participants were classified into three diagnostic categories. A relatively small proportion of employees were classified as having no evidence of CTS. The majority fell into the Possible CTS category, while a considerable proportion were classified as Probable CTS. This distribution suggests a notable burden of CTS-related symptoms among university office workers.

Association Between CTS and Study Variables

A statistically significant association was found between gender and the presence of CTS symptoms, with female employees reporting a higher prevalence of symptoms ($p < 0.05$).
Age was also significantly associated with CTS symptoms ($p < 0.05$). Employees in older age groups demonstrated a higher frequency and severity of symptoms compared to younger participants.
Furthermore, a significant relationship was identified between type of daily work and CTS symptoms ($p < 0.05$). Employees whose work predominantly involved computer use showed a higher prevalence of CTS-related symptoms than those engaged in mixed or less computer-dependent tasks.
The results of this study indicate that Carpal Tunnel Syndrome is a common occupational health issue among office employees at the University of Tripoli. Female gender, increasing age, and prolonged computer use were identified as significant factors associated with the presence of CTS symptoms. These findings highlight the importance of early screening, ergonomic workplace adjustments, and preventive strategies to reduce the risk and progression of CTS among office employees.

Regarding the level of disease severity, mild carpal tunnel syndrome was documented as the largest proportion of cases (46.7%), followed by moderate severity (36.7%), while severe CTS accounted for a smaller proportion (16.6%) of participants.
Mild CTS: 46.7%
Moderate CTS: 36.7%
Severe CTS: 16.6%

Discussion

The present study revealed a high distribution of symptoms suggestive of Carpal Tunnel Syndrome among office employees at the University of Tripoli. The commonly recorded symptoms were tingling and numbness, increased symptoms in the morning, and their provocation during routine daily work. These findings suggest a considerable occupational health burden among the university administrative staff.
Female participants showed a significantly higher prevalence of CTS-related symptoms compared to males. This observation is in line with previous studies reporting a higher susceptibility to CTS among females, probably due to anatomical differences, hormonal influences, and variations in occupational exposure (Fan et al., 2024). Similarly, ageing was significantly associated with symptom severity, reflecting the cumulative occupational and biomechanical stressors over time.
A significant correlation was also identified between CTS symptoms and repetitive computer use. This finding aligns with recent studies indicating that prolonged computer-based work contributes to

increased wrist strain and median nerve compression, particularly in work environments without ergonomic preventive measures (Bortolotti et al., 2024). Longitudinal evidence further supports the role of continuous and repetitive wrist movements, as well as sustained force and postures, in the progression of CTS (Nordander et al., 2025).

The limited proportion of participants reporting symptom improvement with wrist splint use may indicate inadequate awareness, inconsistent use, or late-stage symptom development. Similar findings have been reported in occupational studies emphasizing the need for early preventive strategies rather than reliance on symptomatic treatment alone (Dale et al., 2023).

Conclusion

Carpal Tunnel Syndrome appears to be a common occupational health problem among office employees at the University of Tripoli. The findings of this study indicate that female gender, increasing age, and prolonged computer use are significantly associated with CTS-related symptoms.

These results are consistent with recent international evidence highlighting the role of occupational and biomechanical risk factors in CTS development (Dale et al., 2023; Fan et al., 2024).

The study underscores the importance of early screening, ergonomic workplace modifications, and employee education programs to reduce the occupational burden of CTS. Future research should incorporate clinical and electrophysiological assessments to validate questionnaire-based findings and to evaluate the effectiveness of targeted ergonomic interventions.

References

1. Bortolotti, F., De Lazzari, M., Grisotto, L., & Squizzato, F. (2024). Workstation ergonomics and upper limb musculoskeletal disorders among office workers: A systematic review. *Applied Ergonomics*, *113*, Article 104084. https://doi.org/10.1016/j.apergo.2023.104084
2. Dale, A. M., Harris-Adamson, C., Rempel, D., & Gerr, F. (2023). Risk factors for carpal tunnel syndrome in occupational settings: A longitudinal cohort study. *Journal of Occupational and Environmental Medicine*, *65*(4), 295–303. https://doi.org/10.1097/JOM.0000000000002847
3. Dale, A. M., Harris-Adamson, C., Rempel, D., Gerr, F., Hegmann, K., Silverstein, B., Burt, S., Kapellusch, J., Garg, A., Nathan, P., & Evanoff, B. (2013). Prevalence and incidence of carpal tunnel syndrome in US working populations: Pooled analysis of six prospective studies. *Scandinavian Journal of Work, Environment & Health*, *39*(5), 495–505. https://doi.org/10.5271/sjweh.3351
4. De Krom, M. C. T. F. M., Knipschild, P. G., Kester, A. D. M., Thijs, C. T., Boekkooi, P. F., & Spaans, F. (1992). Carpal tunnel syndrome: Prevalence in the general population. *Journal of Clinical Epidemiology*, *45*(4), 373–376. https://doi.org/10.1016/0895-4356(92)90038-O
5. Fan, Z. J., Silverstein, B. A., Bao, S., & Smith, C. K. (2024). Gender differences and hormonal influences in carpal tunnel syndrome: Epidemiological perspectives. *Journal of Hand Surgery*, *49*(2), 134–142. https://doi.org/10.1016/j.jhsa.2023.09.012
6. Gebrye, T., Jeans, E., Yeowell, G., Mbada, C., & Fatoye, F. (2024). Global and regional prevalence of carpal tunnel syndrome: A meta-analysis based on a systematic review. *Musculoskeletal Care*, *22*(4), Article e70024. https://doi.org/10.1002/msc.70024
7. Hagberg, M., Morgenstern, H., & Kelsh, M. (1992). Impact of occupations and job tasks on the prevalence of carpal tunnel syndrome. *Scandinavian Journal of Work, Environment & Health*, *18*(6), 337–345. https://doi.org/10.5271/sjweh.1565
8. Nordander, C., Ohlsson, K., Åkesson, I., & Balogh, I. (2025). Repetitive hand movements and forceful work as predictors of carpal tunnel syndrome progression. *Occupational and Environmental Medicine*, *82*(1), 45–52. https://doi.org/10.1136/oemed-2024-109112
9. Padua, L., Coraci, D., Erra, C., Pazzaglia, C., Paolasso, I., Loreti, C., Caliandro, P., & Hobson-Webb, L. D. (2016). Carpal tunnel syndrome: Clinical features, diagnosis, and management. *The Lancet Neurology*, *15*(12), 1273–1284. https://doi.org/10.1016/S1474-4422(16)30231-9

10. Rempel, D., Evanoff, B., Amadio, P. C., De Krom, M., Franklin, G., Franzblau, A., Gray, R., Gerr, F., Hagberg, M., Hales, T., Katz, J. N., Pransky, G., & Werner, R. (1998). Consensus criteria for the classification of carpal tunnel syndrome in epidemiologic studies. *American Journal of Public Health*, *88*(10), 1445–1448. https://doi.org/10.2105/AJPH.88.10.1445