DOI: https://doi.org/10.54393/pbmj.v7i07.1042

PAKISTAN BIOMEDICAL JOURNAL
https://www.pakistanbmj.com/journal/index.php/pbmj/index
ISSN (P): 2709-2798, (E): 2709-278X
Volume 7, Issue 7 (July 2024)

Original Article

Prevalence of Carpal Tunnel Syndrome among Tailors

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ARTICLE INFO

Keywords:
Boston Carpal Tunnel Syndrome Questionnaire, Carpal Tunnel Syndrome, Median Nerve, Tailors

How to Cite:
Asif, S., Firdous, A., Tahir, R., Shabbir, A., Rehman, A., & Qasim, M. A. (2024). Prevalence of Carpal Tunnel Syndrome among Tailors: Prevalence of Carpal Tunnel Syndrome. Pakistan BioMedical Journal, 7(07). https://doi.org/10.54393/pbmj.v7i07.1042

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Received Date: 15th February, 2024
Acceptance Date: 14th July, 2024
Published Date: 31st July, 2024

ABSTRACT

Carpal tunnel syndrome is the most prevalent musculoskeletal disorder and a common neuropathic illness. This condition is because of long-term median nerve compression due to repetitive hand movements. Some occupations have a higher risk of acquiring Carpal tunnel syndrome given that they call for continuous wrist use during work hours. Tailors are far more likely to develop Carpal tunnel syndrome as they repeatedly perform motions that applies continuous vibration, repetitive stress and force on the wrist. **Objective:** To determine prevalence of carpal tunnel syndrome among tailors. **Methods:** Cross- sectional study design and non-probability convenience sampling technique was used to collect data from twin cities (Rawalpindi and Islamabad). After synopsis approval, the duration of the study was 6 months. 377 tailors from twin cities were selected. Self-structured and Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) were used. Assessment of symptoms severity and functional limitations of tailors with carpal tunnel syndrome was also done. **Results:** The prevalence of carpal tunnel syndrome among tailors in twin cities was 24.9%. There were (94.8%) males and (5.2%) were females. The tailors having age between 26-30 years were mostly affected with working experience of 15.99 ± 10.81 years. Most of the participants 207 (59.3) worked 6 days in a week. According to Boston Carpal Tunnel Syndrome Questionnaire (BCTQ), there was mild level of symptoms severity and functional limitations were present in tailors suffering from carpal tunnel syndrome. **Conclusions:** This study concluded that prevalence of carpal tunnel syndrome was found in tailors. There was mild level of functional limitations as well as symptom severity among tailors in twin cities.

INTRODUCTION

Carpal Tunnel Syndrome is a common neuropathic disorder in the hand caused by increased pressure on the median nerve exhibiting symptoms like pain, numbness, or tingling on the volar surface of the thumb, index finger, middle finger, and half of the ring finger with difficulty in hand movements. It commonly coincides with symptoms that occur at night, such as hand numbness and pain. It also can cause weakness and loss of grip strength [1]. Carpal tunnel syndrome is diagnosed on both subjective and objective assessment based on symptoms such as numbness, tingling, and pain in the fingers within a minute [2]. EMG electromyograms, which are used as the Gold Standard test to evaluate muscle injury, capture the electrical activity of the afflicted muscles both when they are tensed and at rest. Due to its great specificity in measuring electrical impulses through nerves, nerve conduction studies (NCS) are a confirmatory test. In addition, Tinel's sign and Phalen's test, which involves flexing the wrist forcefully, are used to confirm the presence of carpal tunnel syndrome [2]. The Phalen test's specificity ranges from 40% to 98%, while its sensitivity is 67% to 83%. Tinel's test has a range of 48% to 73% for sensitivity and 30% to 94% for specificity [3]. Needle EMG can also be used to document axon loss in CTS, but it is also typically required to diagnose polyneuropathy, proximate median nerve damage, and radiculopathy of the cervical spine. These conditions can occur instead of or in addition to CTS. To document axonal loss, patients with lowered amplitude of the median compound muscle action potential (CMAP), atrophy of the thenar eminence, or weakening of the Androgen binding protein (APB) may benefit from a needle examination. Neural EMG of the median-innervated thenar muscles is the only method available in certain circumstances to record axonal loss [4]. Although, CTS

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diagnosis is primarily associated with clinical signs, its confirmation is eased by multiple methods including magnetic resonance imaging and ultrasonography. In conservative approach to management of CTS symptoms there exists few measures that could be easily implemented [5]. Van Meir and De Smet extended this work by conducting a meta-analysis of 163 patient data from 35 reported articles, many of which are small case series or individual case reports. In adults, CTS is usually diagnosed clinically and ELECTRODIAGNOSIS can be performed to show the presence of CTS. Clinical indicators of adult CTS are uncommon in CTS secondary to MPS, with difficulty with fine motor tasks being the most common finding [6]. Two kinds of CTS management are used. The first is Conservative and the second one is surgical treatments. Usually, the first treatment is received by patients with mild to moderate symptoms. nonsteroidal anti-inflammatory drugs (NSAIDs), vitamins B6 and B12, the mobilizations of carpal bone, hand splints, corticosteroids and yoga are few potential treatments. Exercise, magnetic therapy, chiropractic and splint treatment are some more conservative therapeutic approaches that haven't substantially decreased symptomatology when compared to controls [3]. The nonsurgical CTS treatment may be provided by a number of different physicians, such as primary care providers, physiatrists, neurologists, and surgeons, which provides a potential for providing nonevidence-based care. The nonsurgical treatment of carpal tunnel syndrome (CTS) consists of multiple modalities: Other treatments were splitting, cortisone injections, hand therapy, and systemic medications [7]. The carpal tunnel area is increased using gradual stretching exercises in conjunction with the special pneumatic and dynamic hand traction tool known as C-TRAC. The hand experiences a "3-point" force of action when the air bladder of the device is inflated, and the apparatus is on the hand. Transverse attachment of carpal ligament is subsequently stretched as a result. The distance between the trapezium and the hook of hamate, as well as the distance between the scaphoid and the pisiform bones, increased by as much as 3 mm according to X-rays are taken with C-TRAC and as well as without the C-TRAC in place [7]. A surgical treatment called a carpal tunnel release (CTR) is performed to treat CTS. The transverse attachment of carpal ligament (TCL) is cut during this treatment, so the carpel tunnel is widened and pressure is released. Between 70 and 90 percent long term success is seen in patients who receives CTR. CTR is a suitable therapy option for diabetic people with CTS and peripheral neuropathy [3]. The UK Royal College of Surgeons provides patient information and advice on returning to work after carpal tunnel release surgery [8]. Thus, the underlying structure of the BCTQ may include, at least, three factors that may be labeled as Functionality, Paresthesia and Pain domains. Two log-linear subscales may be proposed: subscale 1 consists of the Factor-Functionality and the second subscale which includes the Factor-Paresthesia and Factor-Pain under a bifactor model. The degree of correlation between Neurophysiologic and clinical severity classification system is extremely low [9]. The prevalence in normal adult general population is about 5% in women and 2% in men [2]. The aims of managing CTS are to reduce symptoms and restore normal usage of the hand and fingers. At present, the most widely used nonsurgical management everywhere is the use of a rigid wrist brace at night sometimes with other interventions [10]. There are considerable possibilities to find the connection with systemic, anatomical, idiopathic, and ergonomic factors since age, sex, and even BMI could be the risk factors of CTS in certain patients [11]. Another condition that has been associated with CTS is BMI, where the excess of 30 is referred to as obesity; Several studies have however found a connection between BMI and CTS; still, its correlation with other anthropometric factors such as the waist size and size of the wrist remain unknown According to a study 3% to 6% of CTS prevalence was found in general population [12]. According to a previous study conducted in Riyadh, Saudi Arabia, 20% of diabetic patients experience CTS, compared to nearly 62% of pregnant women [13]. A global prevalence of about 4% and 5% of the population is affected by CTS people and the most vulnerable are those in the 40-60 years age bracket [14]. Higher rates of CTS events are also related to the longevity of workers, and with more instances of factors for risk such as diabetes and pregnancies too [15]. As per existing literature, previous international studies have been done to find out the relationship between types of workers and CTS, but no study has been done on tailors. Due to nature of their job, repetitive hand movements cause an increase pressure on the wrist which ultimately could result in median nerve entrapment. Improving knowledge of prophylaxis and raising awareness could reduce the occurrence of CTS.

The study aimed to find out prevalence of CTS among tailors.

METHODS

Descriptive cross-sectional study and convenience (non-probability) sampling technique was employed to collect data from twin cities i.e., Islamabad and Rawalpindi. The duration of study was from February 2023 to June 2023. Ethical approval was issued by the ethical committee of Margalla Institute of Health Sciences, Rawalpindi (Ref No: AF/183/23). A total of 377 participants with CTS were taken into consideration by using Raosoft. Data were collected after taking written informed consent from all participants. Participants were secured regarding confidentiality and were granted the right to seek any detail about the study. Both male and female tailors with age 18 years or above and

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having working experience of minimum one year and working at least 3 days per week were included in the study while participants were excluded if they have any wrist trauma i.e. wrist fracture in the last 3 months, systemic diseases, pregnancy at that time, wrist arthritis, diabetes, thyroid gland disease. Study subjects were interviewed through a self-structure questionnaire that included information regarding demographics, presence of CTS, working experience and working days. The English version of Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) was used. The severity of CTS symptoms and functional limitations was evaluated by Boston Carpal Tunnel Syndrome Questionnaire BCTQ. The BCTQ form consist of 2 parts, Symptom Severity Scale SSS with 11 items which is scored on a Likert measure of 1-5 and the Functional Status Scale FSS with 8 items which is scored from 1-5 with 1 as no trouble and 5 as troublesome. Data were entered and analyzed using SPSS-26.0. Frequency and percentages were calculated for qualitative data. Descriptive analysis was conducted.

RESULTS

Total 377 participants were included in this cross-sectional study. Out of which 28 participants were excluded as they were not fulfilling eligibility criteria. As 16 were having diabetes, 5 having wrist fracture in last three months and 1 was diagnosed with wrist arthritis, 2 female were pregnant, 2 participants were suffering from systemic disease and 2 were suffering from thyroid gland disease. So, final data were analyzed from 349 participants. The demographics and the participant`s characteristics have been mentioned (Table 1).

Table 1: Demographic Characteristics of Participants

Characteristics	Frequency (%)
Age Range	
Up to 20	4 (1.1)
21 to 25	32 (9.2)
26 to 30	82 (23.5)
31 to 35	55 (15.8)
36 to 40	57 (16.3)
41 to 45	46 (13.2)
46 to 50	30 (8.6)
50 above	43 (12.3)
Gender	
Male	331 (94.8)
Female	18 (5.2)
Working Days	
3	8 (2.3)
4	16 (4.6)
5	30 (8.6)
6	207 (59.3)
7	88 (25.2)
Marital Status	
Single	50 (14.3)
Married	299 (85.7)
Extremity Involved	
Right	86 (24.6)
Left	2 (0.6)

Out of 349 participants 87 (24.9%) participants had carpal tunnel syndrome and 262 (75.1%) had no carpal tunnel syndrome (Table 2).

Table 2: Prevalence of CTS among Tailors

Variables	Frequency (%)
With CTS	87 (24.9%)
Without CTS	262 (75.1%)
Total	349

Out of 349 participants 262 (75.1%) were asymptomatic, 51 (14.6%) were with mild symptoms, 28 (8.0%) were with moderate symptoms, 7 (2.0%) were with severe symptoms and 1 (0.3%) was with very severe symptoms (Figure 1).

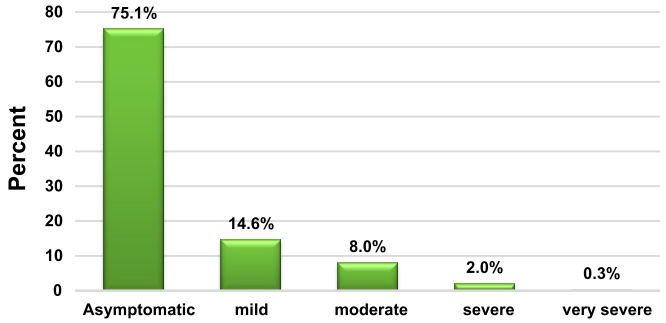

Figure 1: Graphic representation of Boston Symptom Severity Scale.

According to Functional status scoring, out of 349 participants 264 (75.6%) were asymptomatic, 64 (18.3%) were with mild functional limitation, 15 (4.3%) were with moderate functional limitation and 6 (1.7%) were with severe functional limitation. So, our result shows that most of the participants having CTS were with mild functional limitations (Figure 2).

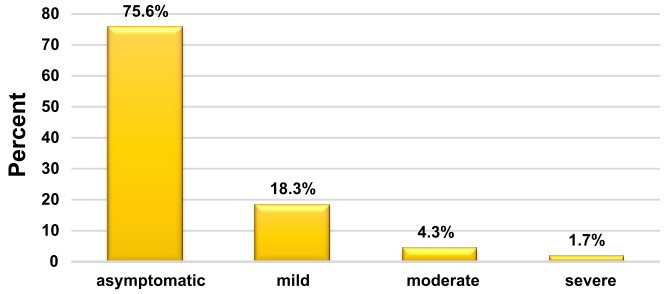

Figure 2: Graphic representation of Boston Functional Status Scale

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DISCUSSION

Carpal Tunnel Syndrome (CTS) is the utmost widespread musculoskeletal pathology caused by compression of the median nerve as it travels through the carpal tunnel at the wrist. Mechanical injury, increased pressure, and ischemia of the median nerve in the carpal tunnel are all contributing factors to carpal tunnel syndrome. 90% of all neuropathy occurrences are CTS, making it the most frequent entrapment of neuropathy. A history of repeated wrist activities, such as typing, vibrating force and sewing, are the most frequent cause of CTS [16]. According to research, the risk of CTS is higher for a number of vocations, especially those that demand constant or repeated hand motion. Worker productivity is lost as a result of carpal tunnel syndrome and other musculoskeletal system problems that can arise from a variety of vocations. The current study showed prevalence of CTS in tailors among twin cities of Pakistan was (24.9%), in contrast to other labor workers as a study conducted in Bangkok on Motorcycle taxi drivers by Danaisawat and Jiamjarasrangsi, had a 20.1% CTS prevalence rate [17]. Among other professions, the most influential factors correlating with CTS development were grocery store workers, hairdressers, telephone operators, and blue-collar workers [18]. The Tool used in current study BCTQ showed most of participants with CTS had mild symptoms severity (8.02%) and functional limitation (18.33%). In 2015, Banerjee *et al.*, conducted research on musculoskeletal morbidity among tailors working in a Kolkata slum. The purpose of this study was to ascertain the prevalence of musculoskeletal disorders among tailors and the factors that are linked to these disorders. In a cross-sectional study, 110 out of the 383 local tailors were selected through simple random sampling, and the tailors were approached at their place of employment to participate in interviews. 65.45% of tailors have musculoskeletal conditions. In this study, disorders affecting people over 45 years of age were discovered, and women were more likely than men to experience musculoskeletal morbidity [19]. This study indicates prevalence of CTS in tailors with minimum working experience of 1 year. The present study shows common age group of participants having age between 26 to 30 years (15.7%), contrast to a previous study conducted by Sitompul in North Jakarta common age group was 35 to 40 years of participants (53.7%) [20]. Due to non-probability convenience sampling, there is male gender dominancy (94.8%) in this study in contrast to previous study in which female gender was more dominant (68.5%). In our study among all the respondents, (94.8%) were male and (5.2%) were female.

CONCLUSIONS

This study concluded the prevalence of CTS was found among tailors with mild level of symptom severity and functional limitations. Moreover, there was a higher proportion of males.

Authors Contribution

Conceptualization: AF, MAQ
Methodology: RT, AF
Formal analysis: SA
Writing, review and editing: AR, AS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

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