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A cross sectional survey of wrist pain and functional impairment in male tailors using Patient Rated Wrist Evaluation (PRWE) questionnaire in South Mumbai

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Abstract
Background: Tailoring involves repetitive hand and wrist movements, prolonged sitting, and continuous fine motor activities, which increase the risk of work-related musculoskeletal disorders. These occupational demands often lead to wrist pain and functional limitations. However, limited studies have focused on wrist-related problems among male tailors in South Mumbai.
Objective: To assess wrist pain and functional impairment among male tailors in South Mumbai using the Patient-Rated Wrist Evaluation (PRWE) questionnaire.
Methodology: A cross-sectional study was conducted on 100 male tailors aged 30–50 years with a minimum of five years of work experience. Participants were selected using convenience sampling. Data were collected using the Nordic Musculoskeletal Questionnaire, Numerical Pain Rating Scale (NPRS), and PRWE questionnaire. Demographic details and work-related factors were recorded. Data were analyzed using descriptive statistics.
Results: The mean age of participants was 38.85 ± 5.71 years, with a mean work experience of 15.32 ± 4.13 years. The mean NPRS score was 2.55 ± 1.67 at rest and 5.74 ± 1.90 during activity. PRWE assessment revealed that 88% of participants had mild disability, while 12% had moderate disability.
Conclusion: Wrist pain and mild functional impairment were prevalent among male tailors in South Mumbai. Early screening and preventive physiotherapy interventions are essential to reduce long-term disability.

Keywords: Wrist pain, tailors, PRWE, occupational health, functional impairment, physiotherapy

Introduction

Tailoring involves monotonous, highly repetitive task like hand and wrist movements for cutting fabric, stitching, pressing, inserting the needle, driving it through the fabric and pulling it out to the other end all in one fluid motion over the sewing machine [1]. Tailoring entails boring, extremely repetitive procedures including cutting, assembling, pressing, and finishing that are carried out while sitting at a desk with the head bowed over the sewing machine. The posture that tailors adopt when executing tasks like stitching and clothing repairs varies depending on the job. In this employment, a variety of elements, including physical, psychological, and mental elements, may have an impact on workers' uncomfortable postures. They therefore run the risk of developing musculoskeletal problems [3].

Many studies conducted found that 85% of sewing machine operators suffered with wrist pain [5]. Tailors frequently use their hands to operate and manipulate the equipment, and they do the same movements such as wrist flexion, extension and rotation repeatedly for extended periods of time.[2] Repetitive hand and wrist motion has been linked to wrist injuries for the past few years, and the one number of instances has been sharply rising [2]. There have been studies to prove that there are a number of musculoskeletal disorders affecting different areas of the body in tailors. However, there is lack of studies in literature that have studied the survey of wrist pain and functional impairment in tailors and hence this study is been carried out [4].

The tailoring industry of India is an unorganized sector, mostly run by private establishments provides employment for both men and women majority from the lower economic classes. The employees of this industry hardly ever benefit from occupational health-and safety provisions. They lack any type of social security, so their ill-health and poverty go hand-byhand and create a stupendous pressure from which they can hardly come out [1].

The patient rated wrist evaluation (PRWE) Questionnaire was used to evaluate pain and functional impairment and it has two subscales, for pain and one for function which allows patient to rate their wrist discomfort and functional impairment [2]. The PRWE is a 15-item questionnaire designed to measure wrist pain and disability in activities of daily living. The PRWE provides clinicians with a standardized outcome tool that is easy to administer and score in the clinic, and complements traditional impairment and radiographic measures. The total PRWE score's test-retest reliability was excellent over both the short term (2-7 days, ICC > = 0.90) and the long term (1 year, ICC = 0.91). The pain subscale also had excellent short-term and long-term reliability (ICC = 0.90, 0.91, respectively). The function subscale demonstrated excellent short-term reliability (ICC > = 0.88) and moderate long-term disability (ICC = 0.61) [6].

NORDIC Musculoskeletal Disorder Questionnaire is used as a screening instrument which collects the consequences of musculoskeletal symptoms in nine body regions [1]. The general Standardized Nordic Questionnaire as a screening instrument that comprised just three questions regarding musculoskeletal pain that is been widely utilized in the absence of any other rigorously reliable assessment tool [1]. The intensity and significance of musculoskeletal problems in occupational categories have been evaluated using the Nordic Musculoskeletal Questionnaire (NMQ) [3].

In this study, we will evaluate the prevalence and intensity of wrist pain and functional impairment among male tailors in south Mumbai using patient rated wrist evaluation (PRWE) Questionnaire.

Methodology

This study adopted a cross-sectional study design and was conducted in South Mumbai. A convenience sampling method was used to recruit participants. A total sample size of 100 male tailors was selected for the study.

Participants were included if they were dominant-hand users, aged between 30 and 50 years, had a minimum work experience of five years, worked up to six hours per day, five days per week, and used manual sewing machines for their occupational activities. Tailors who were unwilling to participate, had a history of wrist fracture or trauma, or had any diagnosed neurological dysfunction were excluded from the study.

Prior to participation, informed consent was obtained from all participants. Demographic details were collected using a structured case record form. Musculoskeletal symptoms were assessed using the Nordic Musculoskeletal Disorder Questionnaire. Pain intensity was measured using the Numerical Pain Rating Scale. Functional status and wrist-related disability were evaluated using the Patient-Rated Wrist Evaluation (PRWE) questionnaire.

All collected data were recorded systematically and analyzed to determine the prevalence and severity of wrist-related musculoskeletal disorders among the participants.

Data Analysis and Results

Data analysis was done using MICROSOFT EXCEL for windows, the frequency distribution and percentage values were calculated and reported.

Demographic data analysis

Table 1: Age wise distribution of participants

No. of years	No. of participants	Percentage
21-30	0	0%
31-40	58	58%
41-50	33	33%
51-60	9	9%

Interpretation: 58% of Participants fall under 31-40 years of age group and 0% of Participants fall under 21-30 years of age group. Mean (±SD) for the above data is 38.85((±5.71)

Table 2: Distribution of participants according to the no. of years of experience

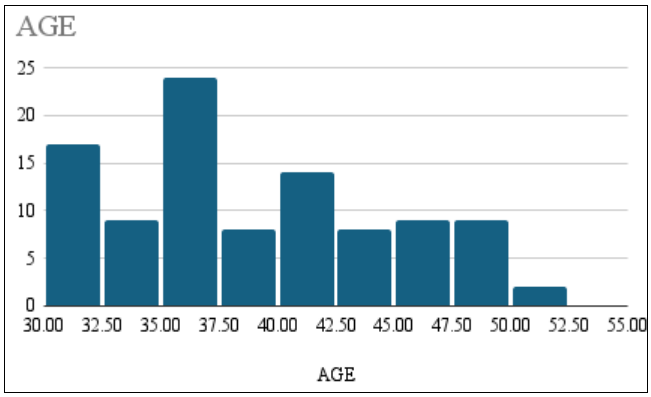
No. of years	No. of participants	Percentage
10-12	18	18%
12-14	22	22%
14-16	20	20%
16-18	11	11%
18-20	9	9%
20-22	8	8%
22-24	8	8%
24-26	3	3%
26-28	1	1%
28-30	0	0%

Interpretation: 22% of Participants fall under 12-14 years of Experience while 0% of Participants fall under 28-30 years of Experience. Mean (±SD) for the above data is 15.32(±4.13)

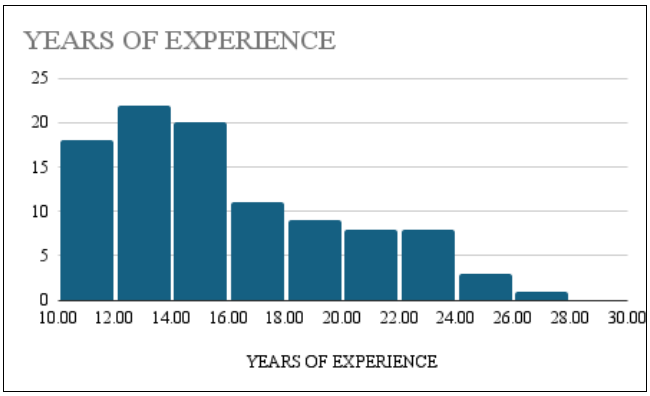
Table 3: Distribution of Participants According to the Duration of Hours per Day

No. of working hours per day	No. of Participants	Percentage (%)
1	1	1%
7	6	6%
8	67	67%
9	19	19%
10	0	0%
12	7	7%

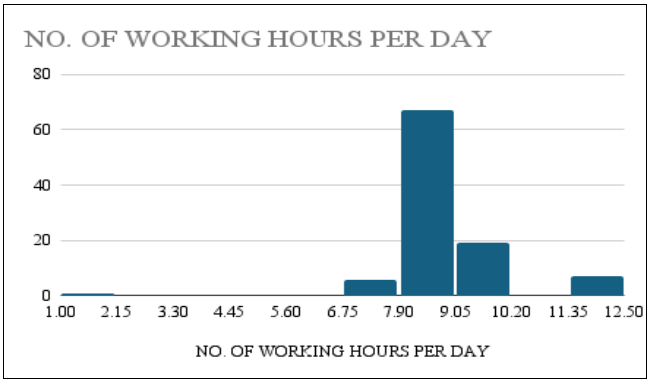
Interpretation: 67% of Participants fall under 8 hours of Working per day while 0% of Participants fall under 10 hours of Working per day. Mean (±SD) for the above data is 9.05 (±1.35)



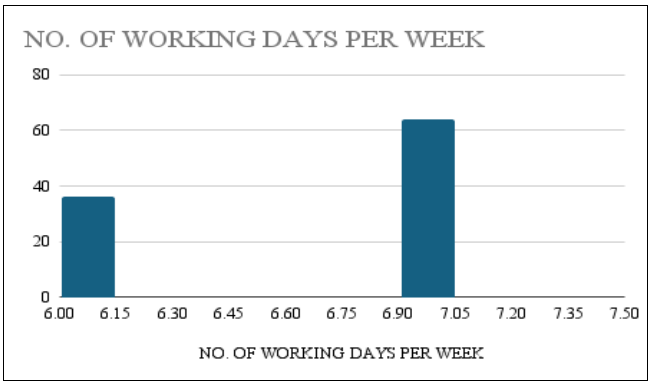
Graph 1: Age Wise Distribution of Tailors



Graph 2: Years of Experience of Tailors



Graph 3: Working Hours per Day



Graph 4: Working Days per Week

Table 4: Distribution of Participants According to the Duration of Days per Week

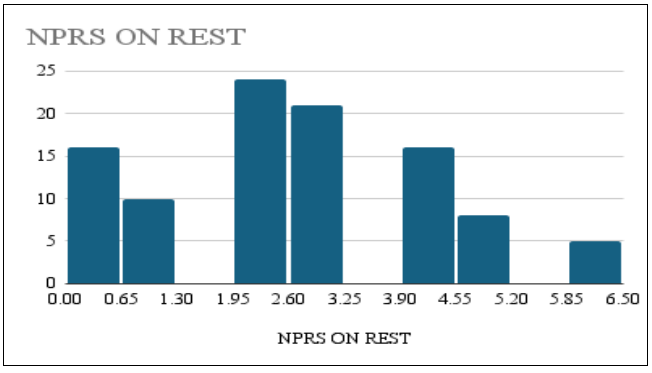
No. of working days per week	No. of Participants	Percentage
6	35	35%
7	65	65%

Interpretation: 65% of Participants fall under 7 days of working per week while 35% of Participants fall under 6 days of working per week.
Mean (±SD) for the above data is 6.64(±0.48)

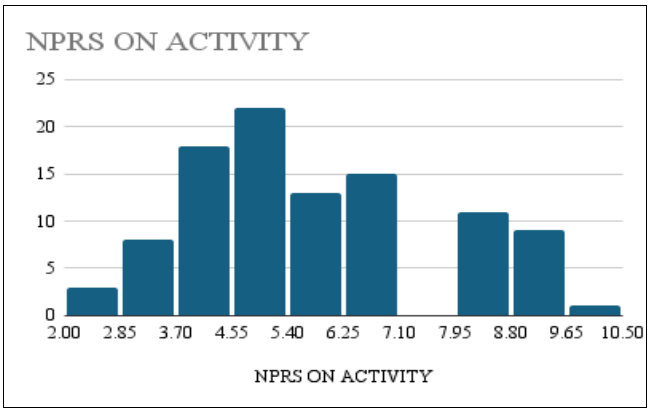
Table 5: Distribution of participants according to the intensity of pain – NPRS at rest

Intensity on NPRS at Rest	No. of Participants	Percentage
0	16	16%
1	10	10%
2	24	24%
3	21	21%
4	16	16%
5	8	8%
6	5	5%

Interpretation: 24% of participants reported Intensity as 2 and 5% percent of participants reported intensity as 6 on NPRS at rest.
Mean (±SD) for the above data is 2.55(±1.67)



Graph 5: Pain Intensity NPRS at rest

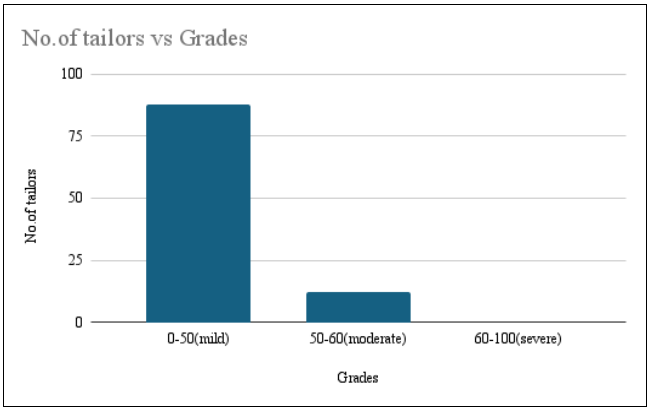


Graph 6: Pain Intensity – NPRS on activity

Table 6: Distribution of Participants According to the Intensity on Pain-NPRS on Activity

Intensity- NPRS on Activity	No. of Participants	Percentage
2	3	3%
3	8	8%
4	18	18%
5	22	22%
6	13	13%
7	15	15%
8	11	11%
9	9	9%
10	1	1%

Interpretation: 22% of Participants reported intensity of pain as 5 whereas 1% of Participants reported Intensity of pain as 10 on Activity.
Mean (±SD) for the above data is 5.74(±1.90)



Graph 7: Type of disability

Table 7: Distribution of participants according to the type of disability

Type Of Disability	No. Of Participants	Percentage
0-50%: Mild Disability	88	88%
50-60%: Moderate Disability	12	12%
60-100%: Severe Disability	0	0%

Interpretation: 88% of participants have Mild Disability, 12% of participants have Moderate Disability and 0% of participants have Severe Disability.

Discussion

The present cross-sectional study aimed to assess wrist pain and functional impairment among male tailors in South Mumbai using the Patient-Rated Wrist Evaluation (PRWE) questionnaire. The findings of this study indicate a high prevalence of wrist-related disability, with 88% of the participants reporting mild functional disability,

highlighting the occupational risk associated with tailoring work.

The mean age of the participants was 38.85 ± 5.71 years, suggesting that wrist pain and functional impairment are common even in the economically productive age group. This finding indicates that prolonged exposure to repetitive wrist movements over the years may lead to early onset of musculoskeletal complaints. Similar age-related trends have been reported in studies on occupational musculoskeletal disorders among workers involved in repetitive hand-intensive tasks.

The mean years of experience among the tailors was 15.32 ± 4.13 years, reflecting long-term occupational exposure? Prolonged years of tailoring involve repetitive wrist flexion–extension, sustained grip, and fine motor activities, which may contribute to cumulative microtrauma of the wrist structures. This may explain the high prevalence of wrist pain and mild functional impairment observed in the study population.

The participants reported working an average of 9.05 ± 1.35 hours per day and 6.64 ± 0.48 days per week, indicating extended working hours with minimal rest. Long working hours without adequate breaks are known to increase musculoskeletal fatigue and reduce recovery time, thereby increasing the risk of pain and dysfunction. These findings support the association between prolonged working hours and the development of work-related wrist disorders among tailors.

Pain intensity measured using the Numerical Pain Rating Scale (NPRS) showed a mean score of 5.74 ± 1.90 during activity, indicating moderate pain during work-related tasks, while the mean NPRS score at rest was 2.55 ± 1.67, and indicating mild pain. This difference suggests that wrist pain in tailors is predominantly activity-related, reinforcing the role of repetitive and sustained wrist movements during tailoring activities as a primary contributing factor.

Despite the presence of pain, the majority of participants (88%) demonstrated mild disability on the PRWE scale. This may be attributed to adaptive coping strategies developed over years of work, where tailors continue their occupation despite discomfort. However, mild disability should not be overlooked, as continued exposure without ergonomic modifications may progress to moderate or severe disability over time.

The wrist is an anatomically intricate structure and is regarded as one of the most complex joints in the human body. Its movements, load distribution, and biomechanical requirements are highly sophisticated, allowing for a wide range of motion while efficiently transmitting loads from the hand to the forearm.

The wrist is a diarthrodial joint composed of eight distinct carpal bones positioned between the forearm bones (radius and ulna) and the five metacarpals. These carpal bones are arranged in two rows. The proximal carpal row consists, from radial to ulnar side, of the scaphoid, lunate, triquetrum, and pisiform, while the distal carpal row comprises the trapezium, trapezoid, capitate, and hamate in the same radial-to-ulnar sequence. Ligaments are essential in directing and limiting the movement of the carpal bones during hand motion. They are classified as extrinsic and intrinsic ligaments. Extrinsic ligaments connect the carpal bones to the radius or metacarpals and include both volar and dorsal components, while intrinsic ligaments originate and insert between the individual carpal bones.[7]

Wrist motion occurs mainly through the combined action of the radiocarpal joint (between the distal radius and the proximal carpal row) and the midcarpal joint (between the proximal and distal carpal rows). Movements of the wrist include flexion, extension, radial deviation, and ulnar deviation, as well as circumduction. These motions are not isolated to a single joint but are distributed across both articulations, allowing greater range of motion while reducing stress on individual structures. The proximal carpal row acts as an intercalated segment with no direct muscular attachments, relying heavily on ligamentous constraints for stability. In contrast, the distal carpal row functions as a more rigid unit due to strong intercarpal ligament connections, transmitting forces from the hand to the forearm. The wrist joint is responsible for transferring forces generated by the hand to the forearm. Approximately 80% of axial load passes through the radius, with the remaining load transmitted through the ulna via the triangular fibrocartilage complex (TFCC). Load distribution varies with wrist position; for example, wrist extension and ulnar deviation increase load across specific carpal bones, potentially predisposing them to overuse injuries during repetitive tasks. Muscles crossing the wrist joint provide dynamic stability and contribute to controlled movement. Flexor and extensor muscle groups work synergistically to balance forces across the joint. Co-contraction of these muscles enhances joint stability, particularly during activities requiring precision or forceful grip. Repetitive or sustained muscle activity, especially in non-neutral wrist positions, can increase mechanical stress on joint structures. From a biomechanical perspective, the wrist is optimized to allow a large range of motion while maintaining sufficient stability for load-bearing activities. However, repetitive movements, sustained awkward postures, and prolonged loading—common in occupations such as tailoring—can disrupt normal biomechanics. Over time, these altered mechanics may result in cumulative microtrauma, ligament strain, pain, and functional impairment.[7]

Overall, the findings of this study emphasize that wrist pain and functional impairment are prevalent among male tailors in South Mumbai, even though most exhibit mild disability. Early identification of symptoms and implementation of preventive strategies such as ergonomic workstation design, regular rest breaks, wrist strengthening and stretching exercises, and occupational health education are essential to prevent progression of disability and improve long-term functional outcomes.

Limitations

1. It was difficult to interact with a large group of tailors due to the nature of their job.
2. Time was a constrain, the tailors did not give more time due to their tightly pack schedule on most days.
3. Ergonomic and postural factors were not evaluated.

Conclusion

Among 100 male tailors in South Mumbai, the majority of participants (88%) exhibited mild wrist-related disability as assessed using the PRWE questionnaire, while the remaining (12%) showed moderate disability.

List of abbreviations

PRWE: Patient Rated Wrist Evaluation
NMQ: Nordic Musculoskeletal Questionnaire

NPRS: Numerical Pain Rating Scale
TFCC: Triangular Fibrocartilage Complex
SD: Standard Deviation

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