



PREVALENCE OF KNEE PAIN AMONG SEWING MACHINE OPERATORS IN AHMEDABAD CITY: AN OBSERVATIONAL STUDY.

Physiotherapy

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ABSTRACT

Background: Sewing machine operators are at high risk for musculoskeletal disorders due to prolonged static postures and repetitive movements. This study aimed to determine the prevalence of work-related knee pain among sewing machine operators in Ahmedabad, India. **Methodology:** This observational study included 100 sewing machine operators aged 25-45 years working in factories and boutiques in Ahmedabad. Participants completed the CAP- Knee questionnaire to assess knee pain and associated factors. Descriptive statistics were used to analyze the data. **Results:** The prevalence of knee pain among participants was 37%. Factors associated with knee pain included awkward knee postures, continuous leg movements, and long working hours. Female workers and those with more years of experience reported higher rates of knee pain. **Conclusion:** There is a high prevalence of knee pain among sewing machine operators in Ahmedabad. Ergonomic interventions and education on proper postures are needed to reduce the risk of musculoskeletal disorders in this population.

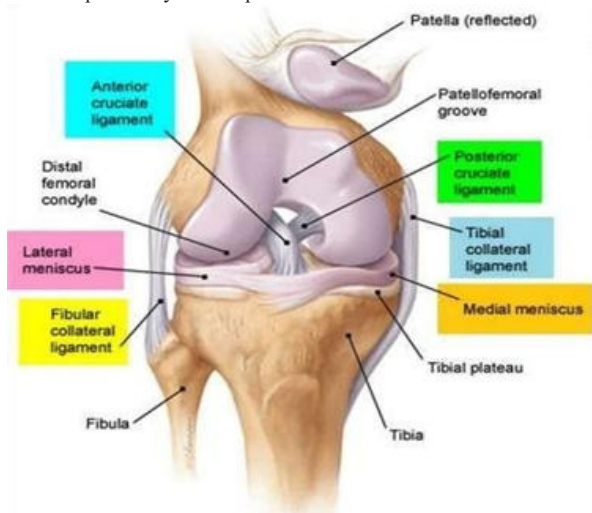
KEYWORDS

Sewing machine workers, Prevalence, Knee pain.

INTRODUCTION

The knee is the largest joint in the body and plays a crucial role in weight-bearing and mobility. Its complex structure makes it vulnerable to injuries and disorders, especially in occupations requiring prolonged static postures. Sewing machine operators are at particular risk for developing musculoskeletal disorders due to the nature of their work.

Sewing machine operation typically involves prolonged sitting in a fixed posture, with continuous movements of the legs to operate foot pedals. This combination of static loading and repetitive movements can lead to strain on the musculoskeletal system, especially in the lower extremities. Previous studies have shown high rates of musculoskeletal disorders among garment workers, but few have focused specifically on knee pain.



The aim of this study was to determine the prevalence of work-related knee pain among sewing machine operators in Ahmedabad, India and to identify associated risk factors.

Understanding the scope of this issue can inform ergonomic interventions and occupational health policies to protect this vulnerable worker population.

METHODS

Study Design And Setting: This was an observational study conducted among 27 sewing factories and 15 boutiques in Ahmedabad, India between September 2023 and February 2024.

Participants:

The study included 100 sewing machine operators aged 25-45 years. Inclusion criteria were: mechanical sewing machine workers, at least 2 years of work experience, and working at least 8 hours per day. Exclusion criteria included recent lower limb injuries or surgeries, fixed deformities, and use of automatic/electronic sewing machines.

Data Collection: Participants completed a demographic questionnaire and the CAP-Knee scale to assess knee pain characteristics. The CAP-Knee is a validated 8-item questionnaire measuring central mechanisms of knee pain.

Statistical Analysis: Descriptive statistics were used to analyze the prevalence of knee pain and associated factors. Data were analyzed using SPSS version 25.0.



Figure 2: CAP Knee Questionnaire fillup



Figure 3: Knee Posture Observation

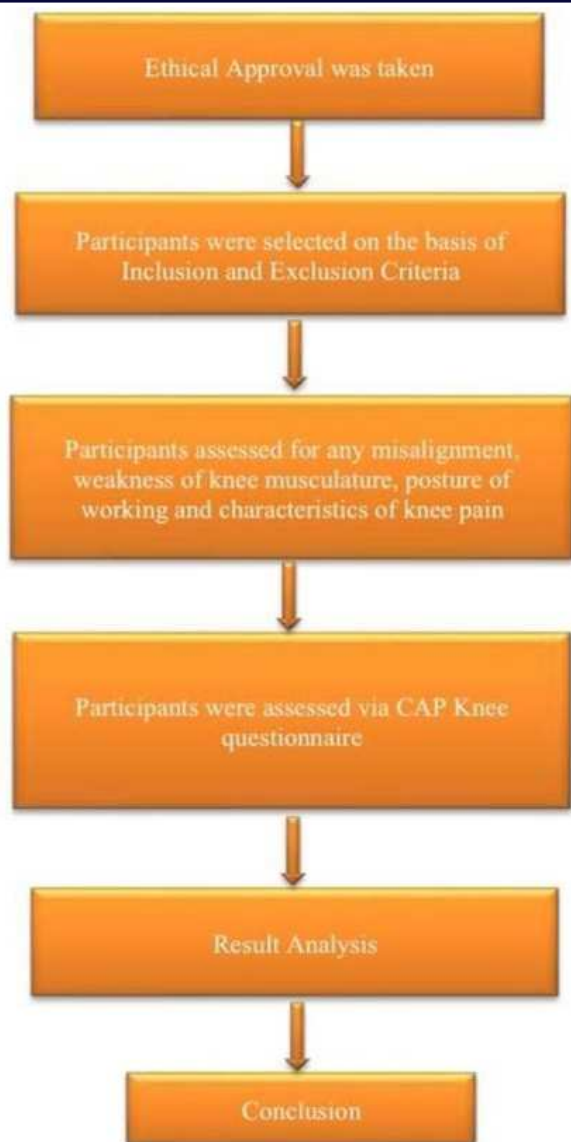
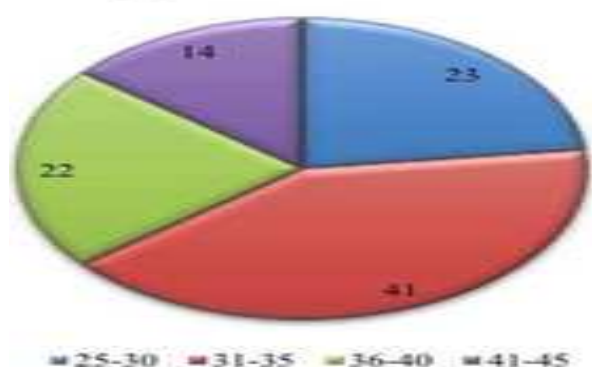


Figure 4: Flowchart of the study procedure

RESULTS**Table 1: Age Distribution**

Age group (in Year)	Subjects
25-30	23
31-35	41
36-40	22
41-45	14

Age distribution

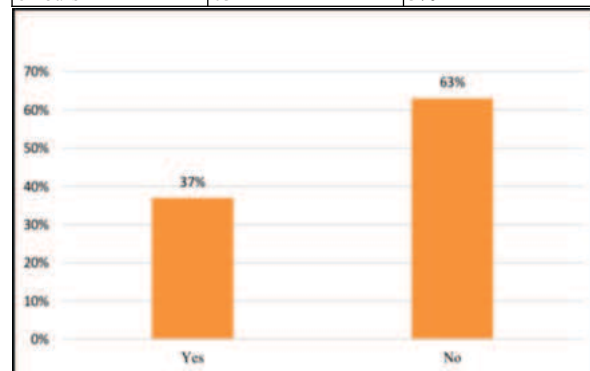
Out of 100 participants, 61% were female and 39% were male. The age distribution was: 25-30 years (23%), 31-35 years (41%), 36-40 years (22%), and 41-45 years (14%). Daily working hours ranged from 2-8 hours, with the majority working 3-5 hours per day.

Table 2: Gender Distribution

Gender Distribution	
Male	39
Female	61

Gender Distribution**Table 3: Hours of Working**

Mode	Number	Percentage
2 hours	10	10%
3 hours	22	22%
4 hours	27	27%
5 hours	14	14%
6 hours	18	18%
7 hours	06	6%
8 hours	03	3%



The prevalence of knee pain among participants was 37%. Factors associated with higher rates of knee pain included:

- Female gender
- Older age
- More years of work experience
- Longer daily working hours
- Awkward knee postures during work
- Continuous leg movements to operate foot pedals

Participants reported that knee pain significantly impacted their daily activities and quality of life. Many had not sought medical attention due to fear of losing work.

DISCUSSION

This study found a high prevalence of knee pain (37%) among sewing machine operators in Ahmedabad. This is consistent with previous research showing elevated rates of musculoskeletal disorders in garment workers. The static loading of prolonged sitting combined with repetitive leg movements likely contributes to the development of knee pain in this population.

Female workers reported higher rates of knee pain, which may be related to anthropometric differences or health-seeking behaviors. Older workers and those with more experience also had higher prevalence, suggesting an accumulative effect of occupational exposures.

Limitations of this study include the relatively small sample size and cross-sectional design. Future longitudinal studies are needed to establish causal relationships between work factors and knee pain development.

CONCLUSION

There is a high prevalence of knee pain among sewing machine operators in Ahmedabad, India. Ergonomic interventions such as adjustable workstations, job rotation, and scheduled breaks may help reduce this occupational health risk. Worker education on proper postures and early symptom recognition is also important.

Policy makers and factory owners should prioritize musculoskeletal health in this vulnerable worker population.

Limitations

Sample size is too small.

Present study did not include other regions of body like Shoulder, Hip, Knee and Back.

pain centre

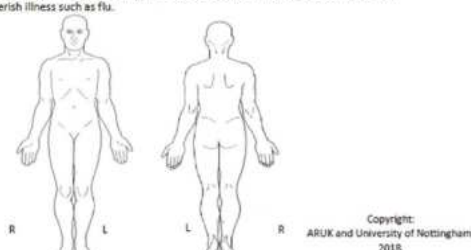
CAP-Knee (Central Aspects of Pain in the Knee) Questionnaire

Name: _____ Date: _____

Please select the response that best describes how you have felt over the **PAST WEEK**.
Please tick one box only per statement and try not to leave any statements blank.

	Never	Sometimes	Often	Always
1. Cold or heat (e.g. bath water) on my knee was painful	☐	☐	☐	☐
2. I generally felt tired	☐	☐	☐	☐
3. Knee pain stopped me concentrating on what I was doing	☐	☐	☐	☐
4. I kept thinking about how much my knee hurts	☐	☐	☐	☐
5. In general, I got sudden feelings of panic	☐	☐	☐	☐
6. Knee pain affected my sleep	☐	☐	☐	☐
7. I generally still enjoyed the things I used to enjoy	☐	☐	☐	☐

8. This final question is about pain you may have had in any part of your body. Please shade in the diagram below, to indicate where you have suffered any pain for most days in the last 4 WEEKS. By pain we also mean aching and/or discomfort. Please do not include pain due to feverish illness such as flu.



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