

Prevalence of Musculoskeletal Disorders in Powerloom Workers

Mahendra Singh Lodhi¹, Momin Wajiha Maryam Shoeb Ahmad²

¹Bachelor of Physiotherapy Student, Royal College of Physiotherapy, Malegaon, Nashik, India

Maharashtra University of Health Sciences, Nashik, India

Associate Professor, Royal College of Physiotherapy, Malegaon, Nashik, India

Correspondence: [mominwajiha\[at\]email.com](mailto:mominwajiha[at]email.com)

²Intern, Royal College of Physiotherapy, Malegaon, Nashik, India

Abstract: Power loom workers in Malegaon face high musculoskeletal disorder (MSD) risks due to repetitive tasks and poor ergonomics. This cross-sectional study assessed 139 male workers (25-40 years, ≥ 10 years experience) using Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) and Rapid Entire Body Assessment (REBA). Lower back (72%), shoulders (63%), and knees (54%) showed highest discomfort. Mean CMDQ score: 142.06 ± 30.87 ; REBA: 7.46 ± 4.12 (86.9% medium-high risk). Age correlated with discomfort ($p=0.012$); REBA linked to CMDQ category ($p=0.0027$). Urgent ergonomic interventions needed.

Keywords: Musculoskeletal disorders, power loom, REBA, CMDQ, ergonomics

1. Introduction

India's textile industry employs millions, with Maharashtra hubs like Malegaon hosting ~300,000 power loom workers operating 8 looms for 12 hours daily. Tasks involve prolonged standing, repetitive pedalling, thread handling, forward bending, and heavy lifting in poorly ventilated units, creating high work-related musculoskeletal disorder (WMSD) risks. Globally, MSDs cause 30% occupational disability; textile workers report 47-90% prevalence.

Malegaon studies are scarce despite unique socio-economic factors- family-run units, limited health access, and cultural pain normalization. Prior research using Nordic Musculoskeletal Questionnaire (NMQ), Rapid Upper Limb Assessment (RULA) identified low back, shoulders, knees as vulnerable sites. Cornell Musculoskeletal Discomfort Questionnaire (CMDQ) measures discomfort intensity/frequency/interference across 9 body regions; Rapid Entire Body Assessment (REBA) scores postural risks (1-4=low, 5-6=medium, 7-10=high, 11-15=very high)

Aim: Determine WMSD prevalence and ergonomic risks in Malegaon power loom workers.

Objectives: (1) Identify most affected body regions; (2) Assess REBA risk levels; (3) Evaluate CMDQ discomfort-work interference; (4) Analyze age-risk correlations.

2. Materials and Methods

Study Design: Cross-sectional observational study (3 months, Malegaon power loom clusters).

Participants: 139 males aged 25-40 years, ≥ 10 years experience, ≥ 12 hours/day (6 days/week). Cluster sampling.

Inclusion: Power loom operators meeting criteria.

Exclusion: Females, < 10 years experience, prior MSD/neurological conditions/ surgeries, red flags, questionnaire incomprehension.

Procedure: Owner consent obtained; informed consent from workers. Demographics collected (age, experience, hours). REBA assessed typical working postures. CMDQ evaluated discomfort in neck, shoulders, upper/lower back, wrists/hands, hips, knees, ankles/feet (score=frequency \times intensity \times interference).

Outcome Measures:

- REBA: Reliability 0.7-0.9; scores trunk, neck, legs, arms, force, coupling.
- CMDQ: Reliability 0.73-0.94; 9 body regions.
- Statistical Analysis: Descriptive statistics (means \pm SD, frequencies). Chi-square tests, Pearson correlations (SPSS-style). Significance $p < 0.05$

3. Results

Demographics: Mean age 39.81 ± 11.82 years (range 20-59); 60% aged 30-49 years.

CMDQ Findings: Total score 142.06 ± 30.87 (range 55-225).

Most affected regions:

Lower back (72%), shoulders (63%), knees (54%) prevalence matches Solapur (47%, RULA/NMQ), Ethiopia (50% low back), and textile studies (58-72%). Repetitive pedalling, forward bending, 12-hour shifts without breaks explain findings. High REBA scores (86.9% medium+) confirm postural risks, consistent with Gujarat (65% moderate-high).

Age-discomfort correlation ($p=0.012$) suggests cumulative exposure; REBA-CMDQ link ($p=0.0027$) proves posture-discomfort causality.

Limitations

Male-only, self-reported CMDQ bias, cross-sectional design.

Strengths

First Malegaon study combining CMDQ/REBA (n=139).

4. Recommendations

- Adjustable seats/pedals;
- Anti-fatigue mats;
- Micro-breaks/stretching;
- Ergonomic training;
- Physiotherapy screening programs.

5. Conclusion

Malegaon power loom workers face severe WMSD burden and ergonomic risks, primarily affecting lower back, shoulders, knees. CMDQ/REBA identify urgent intervention needs to improve productivity and quality of life.

Acknowledgements

Dr. Divya Jethwani (Principal), Royal College staff, power loom owners/workers. No funding/conflicts.

References

- [1] Kolgiri S, Hiremath R. Work-related MSDs in female power loom workers, Solapur. 2018.
- [2] Amare T, et al. Low back pain in Ethiopian weavers. 2023.
- [3] Kumar S, et al. MSD prevalence in textile workers. 2020.