



International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.524

Volume 14, Issue 1, January 2025

Prevalence of Musculoskeletal Discomfort among Female Rickshaw Drivers in Mumbai

Dattani N.¹, Tarmale S.², Pandey S.³, Khan J.F.⁴, Sayyed K.⁵

Assistant Professor, Department of Resource Management, Faculty of Home-Science, Smt. P.N. Doshi Women's
College, Ghatkopar (W), India¹

Undergraduate Students, Department of Resource Management, Faculty of Home-Science, Smt. P.N. Doshi Women's
College, Ghatkopar (W), India^{2,3,4&5}

ABSTRACT: Auto-rickshaws are a vital mode of transportation in Mumbai; the participation of women as drivers is gradually increasing as the transport sector evolves toward greater inclusivity. However, female auto-rickshaw drivers face significant occupational challenges, particularly musculoskeletal discomfort (MSDs), due to the demands of their profession. This study aimed to assess the prevalence of MSDs among female auto-rickshaw drivers in Mumbai and recommend coping strategies for their well-being. A descriptive research design was adopted for the present study. Data was collected using the Extended Nordic Musculoskeletal Questionnaire through an interview schedule. The findings revealed that the most prevalent musculoskeletal discomfort were lower back pain (83.33%), wrist/hand discomfort (66.67%), and shoulder pain (63.33%), with 50% of respondents reporting work interference due to these issues. Recommendations include ergonomic modifications to auto-rickshaws, regular breaks, exercises to alleviate discomfort, financial support for vehicle maintenance and advocacy for policies addressing health concerns of female drivers. This study emphasizes the need for targeted interventions to improve the occupational health and quality of life of women in this emerging workforce.

KEYWORDS: Female, Rickshaw - Drivers, musculoskeletal discomfort

I. INTRODUCTION

In metropolitan cities like Mumbai, auto rickshaws play a pivotal role in public transportation, offering an economical and easily accessible mode of travel. While these three-wheeled vehicles are omnipresent across the metropolitan city, the presence of women behind the wheel is a relatively new sight. Auto-rickshaw driving, traditionally perceived as a masculine profession, has seen a gradual shift as women break through gender norms and stereotypes. For reasons of convenience, a significant number of Indian women prefer opting for taxis and auto-rickshaw driving as their means of livelihood, as opposed to selecting heavier vehicles.

While women taking on roles as autorickshaw drivers marks a significant step towards empowerment and equal opportunities in the transportation sector, engaging in professional driving involves extended periods of sitting in challenging positions, navigating uneven terrain and occasionally conducting small repairs and auxiliary transportation duties. This routine puts the drivers at risk of developing various musculoskeletal discomfort (MSDs).

For female auto-rickshaw drivers, the dual responsibilities of home and work result in prolonged working hours and household chores, increasing susceptibility to musculoskeletal discomfort. This vulnerability is exacerbated by irregular working hours, exposure to distressful noise levels, driving in uncertain weather conditions and prolonged daily work over several years. These factors collectively pose significant occupational challenges within the auto-rickshaw driving profession.

II. REVIEW OF LITERATURE

Musculoskeletal discomfort is a common work-related health concern, particularly among workers in physically demanding occupations. In the transport sector, drivers often spend 7 to 10 hours daily, in traffic, where prolonged sitting, static postures and vibration increase the risk of musculoskeletal disorders, particularly for those operating

buses, auto rickshaws, taxis and trucks due to their challenging work environment. These issues are compounded by exposure to air pollutants, extreme temperatures, seasonal variations, irregular working hours, shift work, poor posture, improper food habits and other stressors inherent in the job [Mohokar, Deoke, & Soaji, 2018].

Musculoskeletal discomfort is a common work-related health concern, particularly among workers in physically demanding occupations. In the transport sector, drivers often spend 7 to 10 hours almost daily, driving in traffic with extended hours of static postures, vibration and challenging work environment that increase the risk of developing musculoskeletal disorders, particularly for those operating buses, auto rickshaws, taxis and trucks. These issues are compounded by exposure to air pollutants, extreme temperatures, seasonal variations, irregular working hours, shift work, poor posture, improper food habits and other stressors inherent in the job [Mohokar, Deoke, & Soaji, 2018].

Study by Ali, Alam, Sufyaan, Ahmad, and Zarrin (2023) revealed a high prevalence of musculoskeletal discomfort (MSDs) in the rickshaw driving profession, with study participants reporting to experience the symptoms in neck, lower back, leg/calf muscles and knees. Similarly, a study by Agarwal, Pradhan, Chaudhuri and Das (2016) focused on low back pain (LBP) among auto-rickshaw drivers in Urban Kolkata, revealing that 79.8% of drivers experienced LBP over the past 12 months, with 36% reporting symptoms in that past week. The study further emphasized a significant association between LBP and forward-bent and twisted sitting postures, highlighting the adverse impact of prolonged driving in poor postures.

Pain in the back was also reported to be the second most common problem after eye problems in a study by Chaudhary, Mattu, and Tomar (2021), that assessed the prevalence of occupational disorders among 150 auto-rickshaw drivers in Meerut city. Additionally, Jadhav, Shende and Deshmukh (2022) from their study involving 30 randomly selected auto-rickshaw drivers from Pune also found that the most common site of discomfort was the upper extremity, especially the neck, with 81% of participants reporting discomfort and 63% experiencing interference with work. In the lower extremity, 65% of participants reported low back pain, with 40% indicating it interfered with their work. The study concluded that musculoskeletal impairments among auto-rickshaw drivers was significantly associated with factors such as age, years of driving experience and poor vehicle maintenance and ergonomics

The cumulative body of research consistently highlights the vulnerability of professional drivers, particularly those in the auto-rickshaw sector, to work-related musculoskeletal disorders. Factors such as poor posture, prolonged periods of static sitting, vibration exposure and physical stressors contribute to an elevated risk of musculoskeletal issues in these workers. While much of the existing literature has primarily focused on male drivers, there is limited research on musculoskeletal disorders (MSDs) among female auto-rickshaw drivers. Thus, this study was undertaken to investigate the prevalence of musculoskeletal discomfort in female auto-rickshaw drivers and suggest coping strategies to promote good health and well-being among them.

III. AIM & OBJECTIVES

Aim: The study was undertaken to investigate the prevalence of musculoskeletal discomfort in female auto-rickshaw drivers and suggest coping strategies to promote good health and well-being with reference to Mumbai city and its suburbs.

Objectives:

1. To explore the socio-demographic and occupational characteristics of female rickshaw drivers of Mumbai.
2. To assess the musculoskeletal discomfort experienced by female rickshaw drivers of Mumbai.
3. To propose strategies to alleviate musculoskeletal discomfort experienced by female rickshaw drivers of Mumbai.

IV. METHODOLOGY

A descriptive research design was adopted for this study, focusing on female rickshaw drivers operating in Mumbai's central and harbour suburbs. The study included 30 participants with a minimum of two years of professional driving experience, selected through random purposive and snowball sampling methods. Data were gathered using an interview schedule developed from existing literature for clarity and comprehensiveness. Extended Nordic Musculoskeletal

Questionnaire was used to assess the musculoskeletal discomfort experienced by female rickshaw drivers. The collected data was analyzed using simple descriptive statistics including frequency, percentages and means.

V. RESULTS AND DISCUSSION

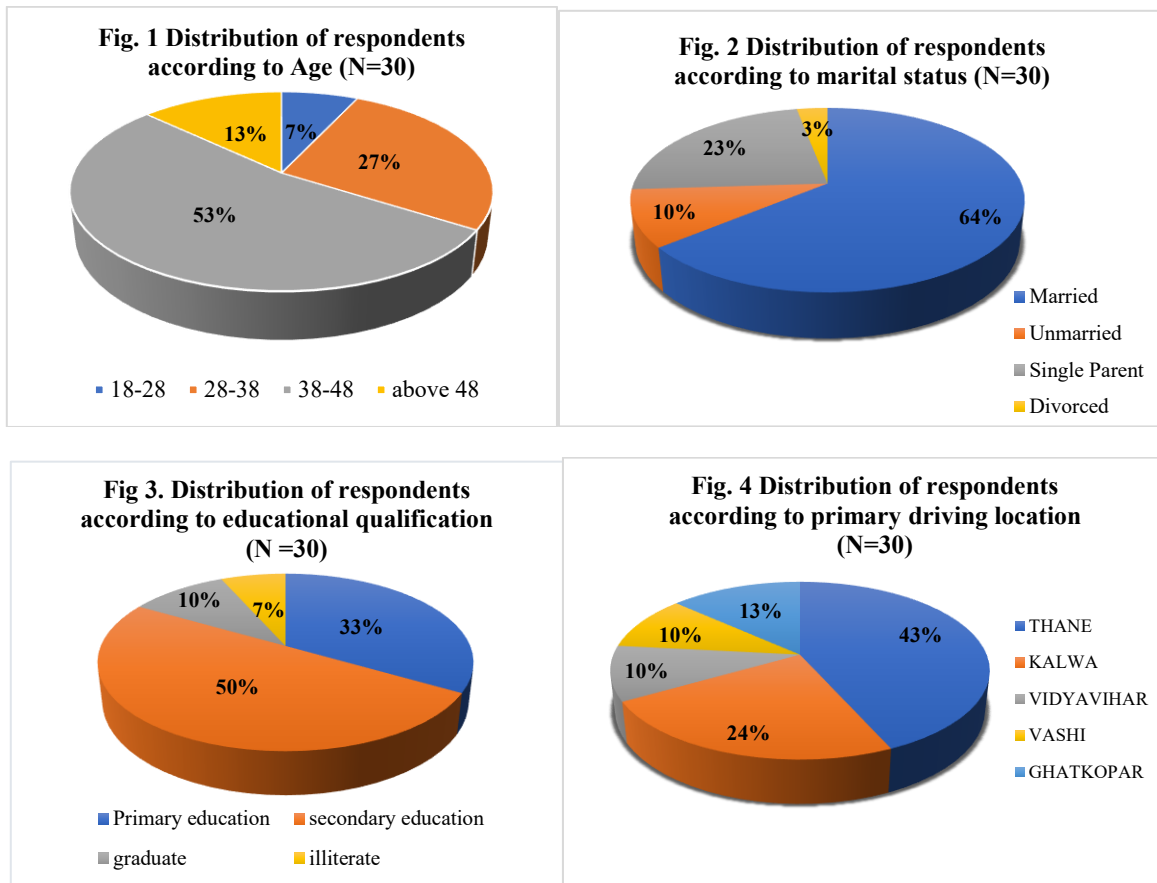


Fig. 1-4 Socio-Demographic Profile of Respondents [N=30]

The demographic profile of the respondents, reveals that the largest segment of female rickshaw drivers comprising of 53%, belonged to the middle-aged category of 38-48 years followed by young adults between 28 - 38 years old that constituted slightly over one-fourth (27%) of the total respondent population; a smaller percentage of female rickshaw drivers (13%) were above the age of 48 years and very few (7%) belonged to the younger age group of 18-28 years.

A large majority of female rickshaw drivers (64%) were married, followed by 10% who were unmarried.; 23% were single mothers and 7% divorced.

Furthermore, half of the (50%) female rickshaw drivers had completed secondary education, with 33.33% reporting to have attained primary education. A smaller group of 10% and 6.67% were graduates and illiterate, respectively.

It was observed that slightly less than half of the female rickshaw drivers operate in Thane (43%), followed by 24% in Kalwa. Smaller but significant groups of female drivers are based in Ghatkopar (13%), Vidyavihar (10%), and Vashi (10%).

Table 1: Work Profile of Respondents [N=30]

Work-profile	Number	Percentage
WORKING DAYS		
All 7 days	15	50%
3-5 days	15	50%
WORKING HOURS		
1-5 hrs	13	43%
6-10 hrs	17	57%
more than 10 hrs	-	-
WORK-SHIFT		
morning	19	63%
late evening/night	0	
flexible	11	37%
MONTHLY INCOME		
1-10 k	9	30%
11-20k	16	53%
21-30k	5	17%
more than 30 k	-	-
DRIVING STATUS		
Independent driving	30	100%
Attached to ola/uber	-	-

The work profile of respondents reveals that a half of the respondents (50%) reported to work every day, with the remaining half (50%) following a traditional workweek, operating on weekdays. A majority of the rickshaw drivers (57%) worked for 6-10 hours, while 43% worked between 1-5 hours with none working more than 10 hours. As for shifts, 63% preferred the morning shift and 37% preferred a flexible shift. In terms of monthly income, 53% earned between 11-20k, 30% earned between 1-10k, and the remaining 17% earned between 21-30k. None earned above 30k. All respondents were independent drivers and were not attached to Ola, Uber, or similar platforms.

Table 2 - Distribution of respondents according musculoskeletal discomfort experienced during rickshaw driving [N=30]

Body parts/ Variables	Musculoskeletal pain experienced		Impact on work
	past 12 months	past 7 days	Prevents work
	f (%)	f (%)	f (%)
Neck	17 (56.67)	10 (33)	5 (17)
Shoulder	19 (63.33)	8 (27)	2 (7)
Upper Back	13 (43)	5 (17)	2 (7)
Elbows	3 (10)	-	-
Wrists/Hands	20 (66.67)	13 (43)	15 (50)
Lower Back	25 (83.33)	15 (50)	16 (53.33)
Hips/Thighs	6 (20)	4 (13)	3 (10)
Knees	14 (46.67)	8 (27)	4 (13)
Ankles/Feet	18 (60)	11 (37)	11 (37)

It is evident from Table 2 that musculoskeletal pain among female rickshaw drivers was observed to be most prevalent in the lower back (83.33%), followed by the wrists/hands (66.67%), shoulders (63.33%), ankles/feet (60%), neck (56.67%), knees (46.67%), upper back (43%), and hips/thighs (20%) over the past 12 months. Pain experienced in the past seven days was reported by 50% of respondents in the lower back, 43% in the wrists/hands, 37% in the ankles/feet, 33% in the neck, 27% in the shoulders and knees, 17% in the upper back and 13% in the hips/thighs. In terms of work interference, 53.33% of respondents stated that lower back pain prevented work, 50% indicated wrist/hand pain hindered work, 37% cited ankle/feet pain as affecting work, 17% reported work prevention due to neck pain, 13% reported knee pain interference, 10% attributed it to hips/thigh pain and 7% to shoulder pain and upper back. These findings align with studies by Ali et al. (2023), Agarwal et al. (2017), and Chaudhary, Mattu, and Tomar (2021), which have also reported a high prevalence of musculoskeletal disorders among professional drivers, with the lower back, neck and wrists/hands being the most commonly affected areas.

VI. CONCLUSION

Female auto-rickshaw drivers in Mumbai encounter significant musculoskeletal challenges stemming from occupational demands and ergonomic issues. Lower back pain, wrists/hands discomfort and shoulder pain emerged as prevalent issues. The dual burden of professional driving and household responsibilities exacerbates these health concerns. Findings suggest that prolonged hours of sitting and inadequate ergonomic design of rickshaws contribute to musculoskeletal discomfort among these drivers. Socio-demographic insights reveal that most respondents are middle-aged, married and possess secondary education. Although driving offers economic stability and empowerment, it places a considerable physical strain on women drivers that requires immediate attention. This study emphasizes the need to address ergonomic risks through practical interventions and support systems. Tailored strategies can help alleviate musculoskeletal pain and improve health outcomes, thereby fostering sustainable livelihoods for women in this sector. The study further recommends extensive research in this area with a larger sample size, to promote better health and well-being among female rickshaw drivers.

VII. RECOMMENDATIONS

1. **Vehicle Modifications:** Introduce ergonomic improvements in rickshaw design, such as adjustable seats and steering mechanisms, seat belts and rest support to reduce discomfort and enhance safety measures.
2. **Work Schedule Adjustments** Taking frequent breaks and adjusting the “driver’s station or seat” to an ergonomically correct position will help reduce chances of experiencing MSD’s or an injury while being behind the wheel. Take a short break for every hour of driving, is ideal.
3. **Regular exercises:** Encourage the practice of warm-up and cool-down exercises before and after driving, as well as during periods of prolonged driving, can significantly decrease the risk of developing musculoskeletal disorders among female rickshaw drivers.
4. **Financial Support:** Offer subsidies for vehicle maintenance to ensure rickshaws remain in optimal condition. Regular maintenance and timely repairs of rickshaws are essential to minimize mechanical stress on the spine caused by sudden stopping and starting of the vehicle.
5. **Policy Implementation:** Advocate for government policies addressing occupational health concerns specific to female drivers in the informal sector.
6. By addressing these areas, the prevalence of musculoskeletal disorders can be Protective/supportive footwear: Encourage the use of cushioned and/or covered footwear to reduce strain and improve comfort during prolonged driving.

REFERENCES

1. Ali, A. M., Alam, M. M., Sufyaan, M., Ahmad, I., Zarrin, S. (2023). Prevalence of work-related musculoskeletal disorders among professional rickshaw drivers in Aligarh, Uttar Pradesh, India. *Work*, 76(3), 1239-1253. doi: 10.3233/WOR-220621. PMID: 37182856.
2. Asian Development Bank. (2018, April 24–25). Conference on gender in urban governance and transport [Conference session]. Tbilisi, Georgia. https://events.development.asia/learning-events/conference-gender-urban-governance-and-transport?utm_source=chatgpt.com

3. Chaudhary, L., Mattu, S., & Tomar, U. S. (2021). Prevalence of occupational health disorders in auto rickshaw drivers - Meerut City: A cross-sectional study. *Indian Journal of Physiotherapy and Occupational Therapy*, 15(1), 49–54.
4. Das, S., Pradhan, A., Agarwal, S., Ray Chaudhuri, G. (May 2017). Prevalence and Risk Factors of Low Back Pain among Auto-Rickshaw Drivers in Urban Kolkata, India. *International Journal of Current Research and Academic Review*, DOI:10.20546/ijcrar.2017.505.011.
5. Gulf News. (2017, April 7). Meet Mumbai's first women rickshaw drivers. Retrieved January 17, 2025, from <https://gulfnews.com/world/asia/india/meet-mumbais-first-women-rickshaw-drivers-1.2010933>
6. India Times. (2016, January 23). Mumbai's first batch of women auto-rickshaw drivers to take to the roads soon. Retrieved January 17, 2025, from <https://www.indiatimes.com/news/india/mumbai-s-first-batch-of-women-auto-rickshaw-drivers-to-take-to-the-roads-soon-249497.html>
7. InUth. (2017, April 15). Meet the first-ever group of Mumbai's female auto-rickshaw drivers. Retrieved January 17, 2025, from <https://www.inuth.com/trends/social-virals/meet-the-first-ever-group-of-mumbais-female-auto-rickshaw-drivers/>
8. Jadhav, K., Shende, M., & Deshmukh, N. (2022). Prevalence of musculoskeletal discomfort in auto-rickshaw drivers dwelling in Pune. *International Journal of Science and Research (IJSR)*, 11(2). <https://www.ijsr.net>
9. Jithu T V. (2019). Empowerment through Employment: A Study among the Women Auto-Rickshaw Drivers. *International Journal of Science and Research (IJSR)*, 8(11), ISSN 2319-7064. ResearchGate Impact Factor (2018): 0.28, SJIF (2018): 7.426. www.ijsr.net
10. Kuorinka, I., Jonsson, B., Kilbom, Å., Vinterberg, H., Biering-Sørensen, F., & Andersson, G. (1987). Standardized Nordic questionnaires for the analysis of musculoskeletal symptoms. *Applied Ergonomics*, 18(3), 233-237. [https://doi.org/10.1016/0003-6870\(87\)90010-X](https://doi.org/10.1016/0003-6870(87)90010-X)
11. Majumdar, D., & Jash, T. (2015). Merits and challenges of E-Rickshaw as an alternative form of public road transport system: A case study in the state of West Bengal in India. *Energy Procedia*, 79, 307–314. <https://doi.org/10.1016/j.egypro.2015.11.492>
12. Mahadik, J. V., Waingankar, P., Anjenaya, S., Sanjeev, S., Mali, K. (2014). Cross-sectional study of health status of auto-rickshaw drivers in Vashi, Navi Mumbai, India. *MGM Journal of Medical Sciences*, 4(4), 164-170. DOI: jp-journals-10036-1164.
13. Mohokar, A. P., Deoke, A. R., & Soaji, A. V. (2018). Prevalence & risk factors of musculoskeletal impairments among auto-rickshaw drivers in a city of central India. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 17(2), 49–54. <https://doi.org/10.9790/0853-1702034954>
14. Sharma, G., Ahmad, S., Mallick, Z., Khan, Z. A., James, A. T., Asjad, M., Badruddin, I. A., Kamangar, S., Javed, S., Mohammed, A. A., Ahammad, N. A. (2022). Risk Factors Assessment of Musculoskeletal Disorders among Professional Vehicle Drivers in India Using an Ordinal Priority Approach. *Mathematics*, 10(23), 4492. <https://doi.org/10.3390/math10234492>
15. Watambale, K. (2023). Female Auto-Drivers: An Exploratory Study of the Opportunities and Challenges of the Non-Traditional Livelihood in Thane District. *Granthaalayah*, 11(2), 5028. College of Social Work, Autonomous, Nirmala Niketan, India. <https://doi.org/10.29121/granthaalayah.v11.i2.2023.5028>.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details