



PREVALENCE OF MUSCULOSKELETAL PAIN AND DISCOMFORT IN COURIER PACKAGING AND MOVING SERVICE WORKERS

¹Dr. Yukta Divakar, ²Dr. Siddhi Tendulkar

¹BPTH, ²Musculoskeletal Sciences, Associate Professor in PES Modern College Of Physiotherapy.

¹PES Modern College Of Physiotherapy, Pune, India.

Abstract: This study has been undertaken to find out the prevalence of musculoskeletal pain and discomfort in courier packaging and moving service workers. These people have to work in awkward postures and lift, carry, push, and pull loads and packages as it is their work demand. But these activities if not done properly or due to overuse can affect the musculoskeletal system adversely resulting in work related musculoskeletal disorders. Standardized Nordic musculoskeletal questionnaire was used to find out prevalence of pain in different body parts. Numerical pain rating scale (NPRS) was used to find the pain intensity in the 'last 7 days' component of Nordic musculoskeletal questionnaire. In the present study it was found that in last 12 months' component of Nordic musculoskeletal questionnaire lower back was highly affected with a prevalence of 62 (48.8%), followed by shoulders with 28 (22%), knees 13 (10.2%), neck 9 (7.1%), wrists/hands 8 (6.3%), upper back 6 (4.7%), less affected in ankles/feet 1 (0.8%). It was also found that in last 7 days' component of Nordic musculoskeletal questionnaire prevalence of low back pain was highest 63 (57.3%), shoulders 23 (20.9%), knees 9 (9.1%), neck 6 (5.5%), upper back 4 (3.6%), wrists/hands 3 (2.7%), ankles/feet 1 (0.9%).

From this study it was concluded that low back is most commonly affected with moderate pain, followed by shoulders and knees in courier packaging and moving service workers.

Index Terms - Prevalence of musculoskeletal pain and discomfort, courier service workers, Nordic musculoskeletal questionnaire, Numerical pain rating scale (NPRS), lower back pain, moderate pain.

I. INTRODUCTION

- ❖ Operational definitions :-
 1. Packers :- Workers working in courier industry who are involved in packing of the packages.
 2. Movers :- Workers working in courier industry who are involved in shifting the packed parcels or packages from one place to another within the company.
- ❖ Health problems range from discomfort, minor aches and pains, to more serious medical conditions that require time off work and medical treatment. The impact of musculoskeletal problems on the workers and their ability to work varies significantly from person to person. [2]
- ❖ Work related musculoskeletal disorders are a group of painful disorders due to repeated basis overuse and affects bones, muscles, joints, ligaments, tendons, nerves, bursa and blood vessels are stressed and traumatized and those body tissues ultimately become damaged. Often associated to or aggravated by the work, these disorders or injuries are termed as work-related musculoskeletal disorders (WMSDs) [1]
- ❖ This category of MSDs takes months or sometimes even years to develop and affect workers in a wide range of occupations. [3]
- ❖ Manual material handling activities have been recognized as the primary source of severe and overexertion injuries in industries [2]. The most important risk factors attributed with such tasks consists of :-
 - (a) repetitive motions (frequent lifting/carrying of loads)
 - (b) forceful exertions (lifting/ carrying of heavy loads)
 - (c) awkward postures (bending/twisting)
 - (d) accumulated pressure points with loads having sharp edges

(e) pushing/pulling of heavy materials. [3]

II. NEED OF STUDY

- ❖ There are a wealth of information on musculoskeletal problems in health care workers, especially nurses and physicians, and blue-collar workers. But there is less information/study available related to packers and movers workers. [3]
- ❖ These people have to carry out tough physical tasks while working in a hazardous environment. [3]
- ❖ These people have to work in awkward postures and lift, carry, push, and pull loads and packages as it is their work demand. [3]
- ❖ But these activities if not done properly or due to overuse mostly can affect the musculoskeletal system adversely resulting in work related musculoskeletal disorders. [3]
- ❖ A study has been conducted on manual material handling workers in courier industry before in a courier industry in Malaysia. [3]
- ❖ But there is lack of information on the musculoskeletal problems among workers that involve in manual handling especially in India. [3]
- ❖ In India, the health issues of the workers working in various unorganized sectors are given less importance. [3]
- ❖ Very limited provision exists for occupational health services in such sectors. [3]
- ❖ Hence, it is important to find out the prevalence of musculoskeletal discomfort in manual handlers in courier industries in India which will help for further research in this field.

III. REVIEW OF LITERATURE

[1] Mohd Shahril bin Abu Hanifah from Malaysia, Selangor conducted prevalence study of Musculoskeletal Problems among Manual Handling Workers in Courier Service Industry using Nordic musculoskeletal questionnaire (NMQ) and by taking socio demographic information, current job information, musculoskeletal symptoms information.

Conclusion :- The prevalence of musculoskeletal problems among manual handling workers was high, with 69.6 % of the workers complaint about having musculoskeletal problems at different part of the body. The most common body parts with musculoskeletal problems among the workers were lower back followed by upper back. This was due to their nature of works that give strain and repetitive movement on the upper and lower back. The results proved that there was significant relationship between duration of employment and education level of workers with musculoskeletal problems.

[2] Mohammed Rajik Khan and Nishant Kumar Singh from Odisha, India conducted a cross-sectional study for the prevalence of musculoskeletal disorders among Indian railway sahayaks. With a modified Nordic questionnaire, data were collected on their demographics, work, and musculoskeletal pain history. Electromyography (EMG) of the upper trapezius muscle of selected 12 healthy sahayaks having no history of neck-shoulder complaints were analyzed under different load lifting and carrying conditions. Additionally, ergonomic risk levels were recorded using Rapid Entire Body Assessment method. The questionnaire revealed that for the past 1 year prevalence, the most affected body regions of railway sahayaks were neck (47%), shoulder (51%), lower back (43%), and knee (47%). The association between age group and MSDs in different body regions were found significant ($p = 0.012$ for neck, $p = 0.017$ for shoulder, etc.). Work experience also had a significant relation to the MSDs in different body regions ($p = 0.013$ for shoulder, $p = 0.023$ for calf, etc.). Analysis of variance reveals high significance level between EMG values and tasks performed by the sahayaks.

Conclusion :- Railway sahayaks were found to have high rate of MSDs which may be associated with lifting/carrying heavy loads in awkward postures. Ergonomic interventions must be implemented to reduce the risk level on this group of workers.

IV. RESEARCH METHODOLOGY

- ❖ **STUDY DESIGN :-** Cross-sectional study
- ❖ **STUDY POPULATION :-** Courier packers and movers.
- ❖ **STUDY SETTING :-** Pune, Maharashtra.
- ❖ **STUDY DURATION :-** 6 months
- ❖ **SAMPLING METHOD :-** Convenient sampling
- ❖ **SAMPLE SIZE :-** 70



V. CRITERIA

❖ INCLUSION

1. Subjects willing to participate.
2. Only males
3. Age group:- 25 - 40 yrs.
4. Working since minimum 2yrs.
5. Daily working hrs :- min. 7-8 hrs/day.
6. Education :- Minimum SSC passed

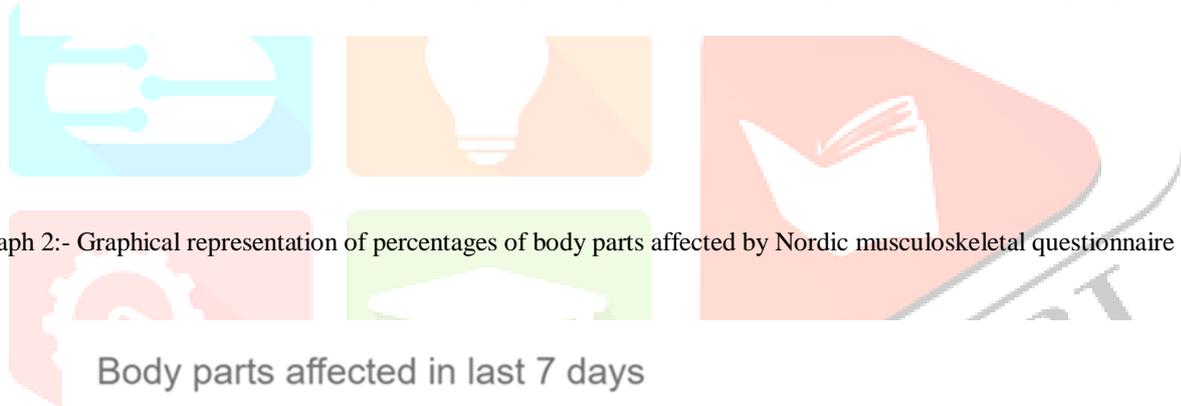
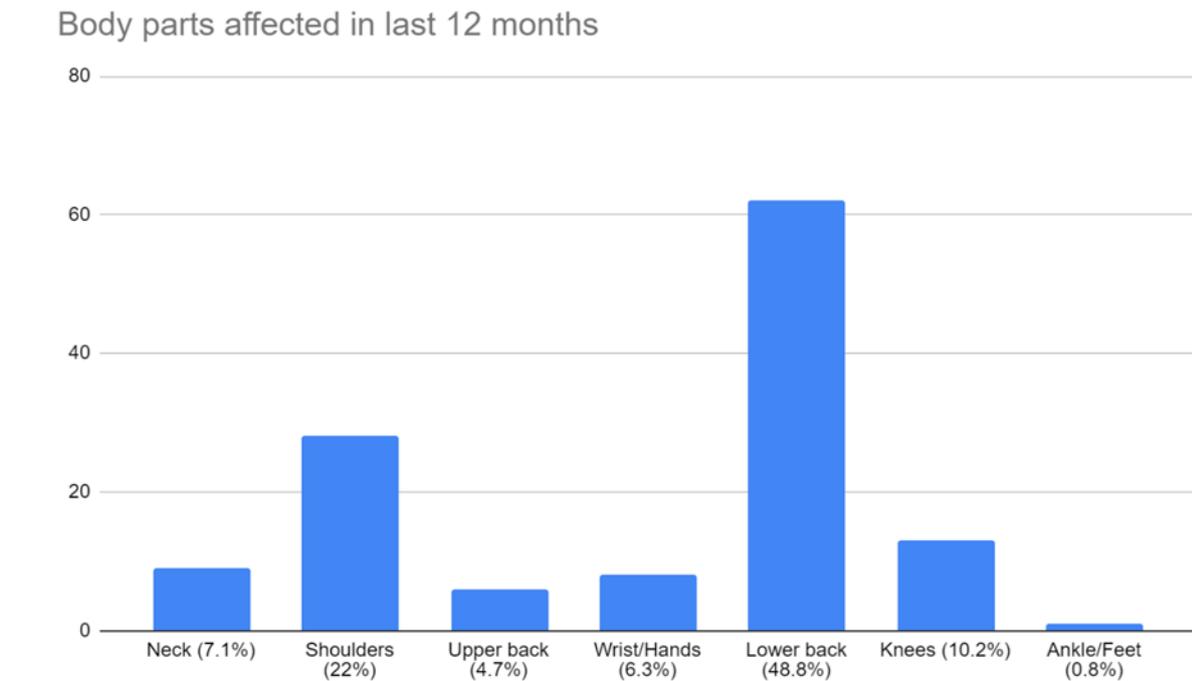
❖ EXCLUSION

1. Subjects not willing to participate.
2. Subjects with any recent musculoskeletal pathology (fractures, surgeries, any diagnosed spinal pathology or deformities)
3. Subjects with hearing problems.
4. Subjects with any diagnosed neurological conditions.
5. Subjects involved in any kind of physical fitness activities.
6. Specially abled people.

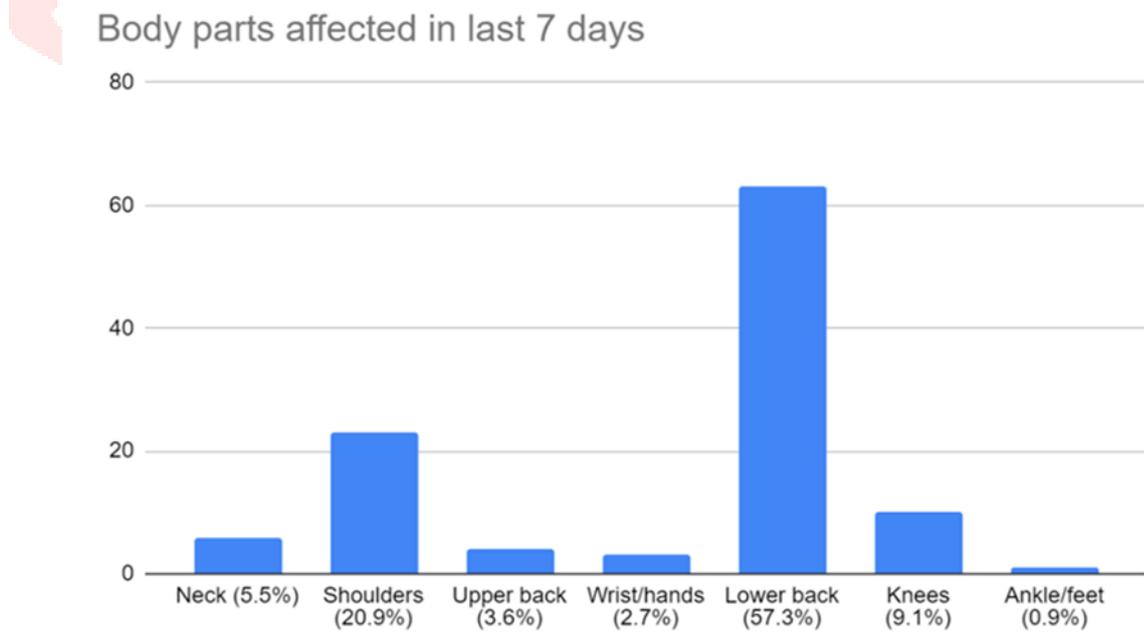


VII. STATISTICAL ANALYSIS

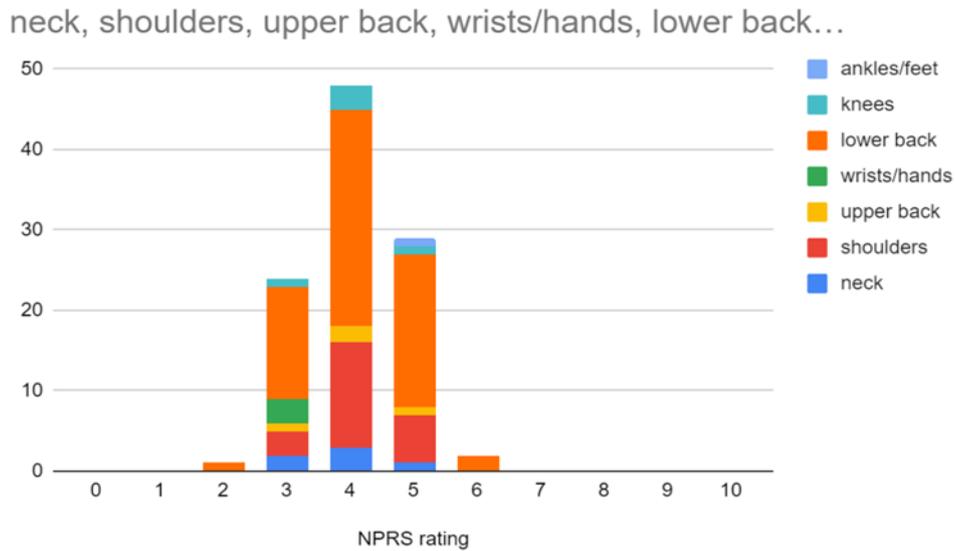
Graph 1:- Graphical representation of percentages of body parts affected by the Nordic musculoskeletal questionnaire.



Graph 2:- Graphical representation of percentages of body parts affected by Nordic musculoskeletal questionnaire



Graph 3:- Graphical representation of severity of pain in different body parts



NPRS rating	Shoulders	Lower back	Knees
0			
1			
2			
3	3 (4.3%)	14 (20%)	1 (1.4%)
4	13 (2%)	27(39%)	3 (4.3%)
5	6 (9%)	19 (27.1%)	1 (1.4%)
6		2 (3%)	1 (1.4%)
7			
8			
9			
10			

VIII. RESULT

- 1) This study was carried out in 70 courier workers by using Nordic musculoskeletal questionnaire and numerical pain rating scale.
- 2) Workers rated the intensity of pain for body parts affected in last 7 days.
- 3) In the present study it was found that in last 12 months’ component of Nordic musculoskeletal questionnaire lower back was highly affected with a prevalence of 62 (48.8%), followed by shoulders with 28 (22%), knees 13 (10.2%), neck 9 (7.1%), wrists/hands 8 (6.3%), upper back 6 (4.7%), less affected in ankles/feet 1 (0.8%).
- 4) It was also found that in last 7 days’ component of Nordic musculoskeletal questionnaire prevalence of low back pain was highest 63 (57.3%), shoulders 23 (20.9%), knees 9 (9.1%), neck 6 (5.5%), upper back 4 (3.6%), wrists/hands 3 (2.7%), ankles/feet 1 (0.9%).

IX. DISCUSSION

- ❖ Aim of the study was to find the Prevalence of musculoskeletal pain and discomfort in courier packaging and moving service workers.
- ❖ Manual material handling activities have been recognized as the primary source of severe overexertion injuries in industries.^[2]
- ❖ Frequently, Manual Material Handling tasks are to be performed in unusual postures.^[2]
- ❖ Mohd Shahril bin Abu Hanifah found that the prevalence of musculoskeletal problems among manual handling workers was high, with 69.6 % of the workers complaint about having musculoskeletal problems at different part of the body.^[2]
- ❖ According to the analysis of numerical pain rating scale done in this study, the intensity of maximum people who had low back pain(48) and shoulders(19) was moderate.
- ❖ Mohammed Rajik Khan etal. stated that one of the main reasons of pain in the upper part of the body is lifting and carrying of heavy loads above shoulder height.^[3]
- ❖ Repetitive motions (frequent lifting/carrying of loads), forceful exertions (lifting/ carrying of heavy loads), awkward postures (bending/twisting), pushing/pulling of heavy materials are the factors that contribute to development of musculoskeletal pain and discomfort in courier service workers.^[3]
- ❖ In the present study it was found that in last 12 months' component of Nordic musculoskeletal questionnaire lower back was highly affected with a prevalence of 48.8%, followed by shoulders with a prevalence of 22%, knees (10.2%), neck (7.1%), wrists/hands (6.3%), upper back (4.7%), ankles/feet (0.8%).
- ❖ It was also found that in last 7 days' component of Nordic musculoskeletal questionnaire prevalence of low back pain was highest (57.3%), shoulders (20.9%), knees (9.1%), neck (5.5%), upper back (3.6%), wrists/hands (2.7%), ankles/feet (0.9%).
- ❖ Low back is most affected as workers have repetitive bending work, constant lifting of loads, and standing for long periods of time.
- ❖ While standing and walking, the increased pressure on your spine can make the lower back muscles especially the extensor muscles like erector spinae to tighten and spasm, leading to pain.
- ❖ Shoulders are followed by low back as workers have to push and pull the loads from one place to another, constantly lift and carry the loads, which puts lot of stress on shoulders.
- ❖ Chronic shoulder pain often stems from prolonged, repetitive, or awkward movements. This type of pain is sometimes referred to as repetitive strain injury. Due to overuse the large shoulder muscles like trapezius, deltoid, pectoralis major which are used in overhead activities go in spasm, fatigue and eventually these muscles get strained.^{[7] [8] [9]}
- ❖ The workers are involved in frequent lifting loads. The lifting muscles of the body are quadriceps, glutes and abdominals. Quadriceps are the knee extensors and they are the lifting muscles hence they easily undergo spasm and strain leading to pain.
- ❖ Knees are the next most affected as the workers tend to stand for prolonged period of time doing their work and they are also involved in sitting and standing repetitively hence they can also be on the risk of developing degenerative disorders in the early age.

X. CONCLUSION

From this study we can conclude that low back is most commonly affected with moderate pain, followed by shoulders and knees in courier packaging and moving service workers.

XI. LIMITATIONS

- ❖ Study was done only in males.
- ❖ BMI was not considered for the study.
- ❖ There was no homogeneity in the years of work experience of workers.
- ❖ Study was carried out only in Pune.
- ❖ Sample size was small.

XII. FUTURE SCOPE

- ❖ Further study can be done by considering postural analysis in these workers.
- ❖ Further study can be done by giving postural correction exercises.
- ❖ Strengthening exercises can be intervened to the workers to reduce the pain and improve work efficiency.

REFERENCES

- [1] Mital, A., Nicholson, A.S., & Ayoub, M.M. (1997). A Guide to Manual Materials Handling (2nd ed.). CRC Press. <https://doi.org/10.1201/9780203719633>
- [2] Mohd Shahril bin Abu Hanifah. Prevalence of Musculoskeletal Problems among Manual Handling Workers in Courier Service Industry. (IJETS) Vol.4 (1) December 2015, Universiti Malaysia Pahang DOI:<http://dx.doi.org/10.15282/ijets.4.2015.1.10.1039>.
- [3] Mohammed Rajik Khan & Nishant Kumar Singh (2018) Prevalence of musculoskeletal disorders among Indian railway sahayaks, International Journal of Occupational and Environmental Health, 24:1-2, 27-37, DOI: [10.1080/10773525.2018.1507187](https://doi.org/10.1080/10773525.2018.1507187)
- [4] Kuorinka, Ilkka, et al. "Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms." *Applied ergonomics* 18.3 (1987): 233-237. [https://doi.org/10.1016/0003-6870\(87\)90010-X](https://doi.org/10.1016/0003-6870(87)90010-X)
- [5] Wang, Michael, Ferry Jie, and Ahmad Abareshi. "A conceptual framework for mitigating supply chain uncertainties and risks in the courier industry." *International Journal of Supply Chain and Operations Resilience* 1.4 (2015): 319-338.
- [6] Anvekar, S. (2007). Courier Services in India: Concerns for Effective Service Delivery. *Ushus Journal of Business Management*, 6(2), 83-90. <https://doi.org/10.12725/ujbm.11.8>
- [7] Miniato MA, et al. (2019). Anatomy, shoulder and upper limb, shoulder. [ncbi.nlm.nih.gov/books/NBK536933/](https://www.ncbi.nlm.nih.gov/books/NBK536933/)
- [8] Seth A, et al. (2019). Muscle contributions to upper-extremity movement and work from a musculoskeletal model of the human shoulder. DOI:[10.3389/fnbot.2019.00090](https://doi.org/10.3389/fnbot.2019.00090)
- [9] Terry GC, et al. (2000). Functional anatomy of the shoulder. [ncbi.nlm.nih.gov/pmc/articles/PMC1323385/pdf/jathtrain00003-0018.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1323385/pdf/jathtrain00003-0018.pdf)

