

Prevalence of Shoulder Pain Among Food Delivery Riders in Nagpur City Using Shoulder Pain and Disability Index (SPADI)

Nayan Tikale¹; Dr. Kanvi Jagani²

²Research Guide

¹Bachelor of Physiotherapy Student Smt. Radhikatai Pandav College of Physiotherapy, Nagpur, Maharashtra, India

²MPT, Professor, Smt. Radhikatai Pandav College of Physiotherapy, Nagpur, Maharashtra, India

Publication Date: 2026/09/14

Abstract:

➤ *Background:*

Food delivery riders spend long hours riding motorcycles or scooters and often carry heavy delivery bags. Prolonged riding, sustained posture, repetitive upper-limb movements, and road vibrations may place increased stress on the shoulder region, leading to pain and functional limitations. Shoulder pain can affect both work performance and daily activities. Therefore, this study aims to determine the prevalence of shoulder pain and disability among food delivery riders in Nagpur city using the Shoulder Pain and Disability Index (SPADI).

➤ *Aim:*

To find out the prevalence of shoulder pain among food delivery riders in Nagpur city using Shoulder Pain And Disability Index (SPADI).

➤ *Objective:*

To determine the prevalence of shoulder pain among food delivery riders in Nagpur city using Shoulder Pain And Disability Index (SPADI).

➤ *Materials and Methodology:*

- Study Design: Prevalence Study
- Study Setting: Nagpur city
- Duration of Study: 6 Months
- Study Population: Male Food delivery riders working in Nagpur city.
- Sampling Method: A convenient sampling
- Sample Size: Required sample size is 44.
- Sample Size Estimation Formula

$$n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2}$$

Where,

- ✓ P: Expected proportion
- ✓ D: Absolute precision
- ✓ 1- α /2: Desired Confidence level

➤ Results:

A total of 44 food delivery riders participated in the study. The majority of participants were aged 26–30 years (45.45%), had 0–2 years of work experience (59.09%), and drove for 9–11 hours per day (56.82%). According to the SPADI assessment, moderate disability was the most common category, while the majority of participants experienced mild-to-moderate to high levels of shoulder pain. The findings indicate a considerable level of shoulder pain and associated functional disability among the food delivery riders included in the study.

➤ Conclusion:

The study concludes that food delivery riders demonstrated a considerable level of shoulder pain and disability. The findings highlight the importance of early identification, ergonomic awareness, proper riding posture, regular rest breaks, and preventive physiotherapy strategies to reduce shoulder-related problems in this occupational group.

Keywords: Shoulder Pain; Food Delivery Riders; Shoulder Disability; SPADI; Musculoskeletal Disorders; Occupational Health; Nagpur City.

How to Cite: Nayan Tikale; Dr. Kanvi Jagani (2026) Prevalence of Shoulder Pain Among Food Delivery Riders in Nagpur City Using Shoulder Pain and Disability Index (SPADI). *International Journal of Innovative Science and Research Technology*, 11(9), 164-175. <https://doi.org/10.38124/ijisrt/26sep155>

I. INTRODUCTION

The food delivery industry has experienced rapid growth due to changing consumer preferences, technological advancements, and the increasing use of app-based delivery platforms. This expansion has created numerous employment opportunities for gig workers, particularly food delivery riders. A two-wheeler and its rider together function as a constrained workstation, where the rider maintains nearly the same posture throughout the journey.⁽¹⁾ However, the occupational nature of food delivery work requires riders to spend prolonged periods on motorcycles, often involving repetitive movements, sustained postures, limited rest intervals, and continuous exposure to traffic and environmental demands. These occupational characteristics may increase the risk of developing work-related musculoskeletal problems.⁽²⁾

Two-wheelers are regarded as a fast, fuel-efficient and low maintenance mode of transportation. Prolonged maintenance of a static posture can restrict normal movement and circulation, contributing to muscle stiffness, discomfort, and fatigue.⁽³⁾ Motorcycles serve as their primary workstation because of their convenience, ease of parking, and ability to navigate through traffic efficiently for food delivery riders. During prolonged riding, the rider and motorcycle function as a combined workstation, requiring the rider to maintain a relatively fixed posture while controlling the vehicle. The posture adopted during riding is influenced by several factors, including seat height, footrest position, handlebar height and reach, and the rider's individual body dimensions.⁽⁴⁾ Additionally, inappropriate motorcycle ergonomics, such as excessive handlebar reach or unsuitable saddle height, may contribute to increased physical strain and aggravate musculoskeletal symptoms.⁽⁵⁾

Among the various body regions exposed to occupational stress during motorcycle riding, the shoulder may be particularly vulnerable. The shoulder complex plays an important role in maintaining upper-limb positioning and controlling the handlebars during steering and manoeuvring. Prolonged positioning of the upper limbs, repetitive steering

movements, and sustained muscular activity may contribute to muscle fatigue and mechanical stress around the shoulder. Consequently, repeated occupational exposure may increase the likelihood of developing shoulder discomfort and pain.⁽⁶⁾

Shoulder pain is an important musculoskeletal complaint because it can affect movement, muscle strength, functional capacity, and the performance of daily and occupational activities. For food delivery riders, shoulder function is particularly important because effective upper-limb control is required for steering, manoeuvring the motorcycle, handling delivery items, and performing other work-related tasks. Persistent shoulder pain or dysfunction may therefore interfere with their ability to perform these activities efficiently and may negatively affect their occupational performance.⁽⁷⁾

The assessment of shoulder pain and associated functional limitations is therefore important in occupational populations exposed to repetitive and sustained upperlimb demands. The Shoulder Pain and Disability Index (SPADI) is a self-reported, condition-specific questionnaire developed to assess pain and disability associated with shoulder disorders.⁽⁸⁾ It evaluates both pain and functional disability and provides a standardized method for determining the severity and functional impact of shoulder-related symptoms. Assessment of functional status is an important component in understanding the impact of shoulder disorders and evaluating treatment outcomes.⁽⁹⁾

The rapid expansion of app-based food delivery services in India has resulted in a growing population of delivery riders who are exposed to prolonged and repetitive motorcycle riding as part of their daily occupation. Despite this growing workforce, limited information is available regarding the prevalence of shoulder pain among food delivery riders and its potential impact on their functional abilities.⁽¹⁰⁾

➤ *Aim*

To find out the prevalence of shoulder pain among food delivery riders in Nagpur city using Shoulder Pain And Disability Index (SPADI).

➤ *Objective*

To determine the prevalence of shoulder pain among food delivery riders in Nagpur city using Shoulder Pain And Disability Index (SPADI).

➤ *Need for the Study*

The shoulder plays a key role in handlebar control, steering stability, and maintaining upper limb endurance during prolonged two wheeler riding. Continuous upper limb loading, sustained arm positions, and repetitive movements performed during daily delivery tasks place considerable physical demands on shoulder complex. In addition, food delivery rider frequently carry heavy bags on their shoulders, which further increases external load mechanical stress during occupational activities. As shoulder is directly related to work efficiency and ability to perform occupational tasks safely, understanding its functional status is clinically important.

II. REVIEW OF LITERATURE

- *Benson TM, Sathiyarajeswaran NS, Radhakrishnan R, et al. Factors and Prevalence of Musculoskeletal Pain Among the App-Based Food Delivery Riders in Tamil Nadu: a Cross-Sectional study. Discov Soc Sci Health. 2025;5:14.*

This study concluded that the study reported a high prevalence of musculoskeletal pain among food delivery riders, with the lower back being one of the most commonly affected regions. The findings highlighted that prolonged riding and the physical demands associated with food delivery work may contribute to musculoskeletal problems. The authors emphasized the limited research available on pain and injuries among food delivery riders and the need to prioritize the health and safety of workers involved in prolonged riding and driving activities.

- *Samad NI, Maridin AF, Hamzah NA, Anua SM, Mamat MN, Nawi MN. Prevalence of Back Pain Among Food Delivery Riders in Kota Bharu, Kelantan: a Preliminary Study. J Energy Saf Technol. 2023;5(2):52-60.*

This study concluded that the highest 12 months' prevalence was low back pain, while for seven days' prevalence was led by lower back pain and shoulder pain. This was followed by shoulder and neck pain with, respectively and upper back pain with. The primary influencing factors of back pain that the respondents presumed were prolonged sitting, followed by discomfort while riding and bad posture while riding. The selected factors that had a significant association with back pain were working experience, classification of work, the activity of lifting load and bending body, and delivery bag lead to bad posture.

- *Tembhurne S. Prevalence of Riding Related Musculoskeletal Disorders and Disability Among Motorcyclists in Pune Region: a Cross-Sectional Study. Galore Int J Appl Sci Humanit. 2025;9(2):59-68.*

This study concluded that there is high prevalence of riding related musculoskeletal disorders among motorcyclists. The prevalence of musculoskeletal disorders is seen highest in cruiser group of motorcyclists followed by sports group of motorcyclists and least prevalence is seen in commuter group of motorcyclists. There is significant association found between intensity of musculoskeletal pain and type of motorcycle ridden by motor cyclists group of motorcycle. Region wise prevalence of musculoskeletal disorders was found highest in Upper Back, Lower back, shoulder and neck among all three categories.

- *Anoop GA, Binoosh SA. A Study on Musculoskeletal Disorders Among Two Wheeler Riders of Kerala State in India. Kerala Technol Cong KETCON. 2019;6:411-8.*

This study concluded that musculoskeletal disorders are highly prevalent among two-wheeler riders, with lower back pain being the most commonly reported complaint, primarily due to prolonged riding hours and constrained postures. A considerable prevalence of musculoskeletal symptoms was also observed in the upper back, shoulder, and neck regions. The findings suggest that prolonged exposure to riding-related postures may contribute to musculoskeletal problems irrespective of age, gender, or type of vehicle.

- *Chitrarasu K, Sathish K. Outcome of Activity Modification in Management of Mechanical Low Backache Among the Motorbike Drivers in Delivery Service. Int J Res Med Sci. 2021;9(8):2300-2305.*

This study concluded that the moderate to severe disability as well as impaired quality of life are impacts as consequences of Non Specific low back pain, due to various ergonomic factors involved while riding of motorbike .

- *Pandis P, Prinold JA, Bull AM. Shoulder Muscle Forces During Driving: Sudden Steering Can Load the Rotator Cuff Beyond its Repair Limit. Clin Biomech. 2015;30(8):839-846.*

This study concluded that sudden steering movements can produce high loads on the shoulder muscles, particularly the rotator cuff, which may exceed the normal load-bearing capacity of the tissues. Repetitive or sudden steering manoeuvres during prolonged driving may therefore increase mechanical stress on the shoulder and contribute to the development of shoulder discomfort and musculoskeletal problems.

- *Panumasvivat J, Surawattanasakul V, Kwangsukstith S, Mahakkanukrauh C, Kiratipaisarl W. The Relationship Between Working Conditions, Vehicle Factors, and Work-Related Musculoskeletal Disorders Affecting job Satisfaction and job Stress Among Motorcycle Food Delivery Riders. Int J Hyg Environ Health. 2025;267:114594.*

This study concluded that motorcycle food delivery riders have a high prevalence of work-related musculoskeletal disorders, particularly affecting the shoulder,

neck, and lower back. Longer working hours, awkward postures, and repetitive movements were significantly associated with musculoskeletal pain, highlighting the need for ergonomic interventions and improved working conditions among food delivery riders.

- MacDermid JC, Solomon P, Prkachin K. *The Shoulder Pain and Disability Index Demonstrates Factor, Construct and Longitudinal Validity. BMC Musculoskeletal Disord.* 2006;7:12.

This study provides additional support for the validity of the SPADI in clinical evaluation of shoulder pain and disability in that it discriminates between levels of pain and disability in a community-based sample. It provides new information suggesting that negative pain coping strategies are associated with greater self-reported pain and disability. Future studies should focus on comparing competing measures to encourage greater uniformity or comparability across future clinical outcomes studies.

- Van Der Heijden GJ, Leffers P, Bouter LM. *Shoulder Disability Questionnaire Design and Responsiveness of a Functional Status Measure. J Clin Epidemiol.* 2000;53(1):29-38.

This study concluded that the Shoulder Disability Questionnaire (SDQ) is a reliable and responsive measure for assessing functional status and disability in individuals with shoulder disorders. It demonstrated that the questionnaire can effectively identify limitations in daily activities associated with shoulder problems and can be used to evaluate changes in functional status over time. This study supports the importance of assessing not only shoulder pain but also the resulting functional disability in individuals with shoulder-related conditions. Therefore, the use of standardized and responsive assessment tools such as the SDQ is valuable for evaluating the impact of shoulder problems on daily activities and functional performance.

- Chawathe VS, Mhambre AS, Gaur AK, Pusnake VJ, Sharma R, Wangdi NI. *Prevalence of Pain in Medical Representatives Using Two-Wheeler for Daily Commute. J Musculoskeletal Ultrasound Pain Med.* 2017;3(2):61-65.

This study concluded that The findings of the study can be concluded as follows. There is a higher prevalence of musculoskeletal pain in medical representatives exposed to daily long-term use of two wheelers. There is also a significant disability or limitation of daily activities associated with this pain in two-wheeler users. There is a good dose-response relationship between exposure to two-wheeler use and pain. Lastly, the various areas of distribution of pain point out toward the research and ergonomic intervention possible in this subject.

- Yahya M, Kiran Q, Shaukat S, Naveed M, Tariq U, Bilal M. *Prevalence of Low Back Pain and Physical Disability in Food Delivery Riders. Med J South Punjab.* 2025;6(4):17-24.

The study concluded that low back pain and physical disability are prevalent among food delivery riders, highlighting the negative impact of prolonged riding and occupational demands on their physical health. It emphasizes

the need for early identification, preventive measures, and appropriate ergonomic interventions among food delivery riders.

- Amod B, Shubhangi A, Sandeep G, Prashant T. *Study of Occupational Factors Associated with Low Back Pain in Truck Drivers of Nagpur city, India. Int J Med Health Sci.* 2012;1(3):53-60.

The study concluded that occupational factors such as prolonged driving, repetitive postures, and work-related physical demands contribute significantly to musculoskeletal problems among truck drivers. The findings highlight the importance of ergonomic modifications and preventive strategies to reduce work-related musculoskeletal disorders in professional drivers.

- Alrashidi Y, Sriram S, Beek MA, Fadlalmola HA, Albadrani M. *Work-Related Musculoskeletal Disorders Among Gig-Based Food Delivery Workers: a Systematic Review and Meta-Analysis. Front Public Health.* 2026;14:1788523.

This study concluded that food delivery workers experience a high burden of work-related musculoskeletal disorders, with the shoulder being one of the commonly affected regions. The findings highlight the need for improved ergonomic practices and preventive measures among food delivery workers.

- Joseph L, Standen M, Paungmali A, Kuisma R, Sittlerpisan P, Pirunsan U. *Prevalence of Musculoskeletal Pain Among Professional Drivers: a Systematic Review. J Occup Health.* 2020;62(1):e12150.

This study concluded that professional drivers have a high prevalence of musculoskeletal pain, with the low back, neck and shoulder being commonly affected regions. The findings suggest that occupational factors such as prolonged posture, vibration and repetitive activities may contribute to musculoskeletal problems among drivers.

- Khera S, Lokras S, Np K, Gitte SV. *Musculoskeletal Health and Mental Wellbeing of Occupational Two-Wheeler Delivery Drivers from Mumbai Metropolitan Region. Indian J Med Res.* 2026;164(1):153-155.

This study concluded that occupational two-wheeler delivery drivers experience a high prevalence of musculoskeletal discomfort, with the shoulder and upperlimb regions being commonly affected. The findings suggest that prolonged motorcycle riding and occupational demands may contribute to musculoskeletal problems among delivery workers.

III. MATERIALS & METHODOLOGY

- Study Design: Cross-sectional Study
- Study Setting: Nagpur city
- Duration of Study: 6 Months
- Study Population: Male Food delivery riders working in Nagpur city.
- Sample Size: Required sample size is 44.

➤ *Sample Size Estimation:*

It is estimated based on prevalence of Shoulder pain and disability among Food delivery riders worker reported in published article (Reference : Factors and prevalence of musculoskeletal pain among the App based food delivery riders in Tamil Nadu: a cross sectional study Thomas M. Benson¹ · Narrain Shree Sathiyarajeswaran¹ · R. Radhakrishnan¹ · A. Abdul Gaffoor¹ · M. Krupalakshmi¹ · Janmejaya Samal¹) with following assumptions.

- Prevalence of shoulder pain among food delivery riders = 26.12%
- Absolute precision = 13 %

➤ *Method of Selection of Study Subject*

Table 1 Method of Selection of Study Subject

INCLUSION CRITERIA	EXCLUSION CRITERIA
1. Food delivery riders in Nagpur city	1. History of shoulder fracture, surgery, or dislocation.
2. Age group: 20–35 years (Male)	2. Neurological disorder (Stroke, Myasthenia Gervis, Gulian Barrie Syndrome, Multiple sclerosis)
3. Riders using two-wheelers for deliveries.	3. Less than 6 months of work experience.
4. Riders working a minimum 5-6 hrs daily.	4. Participants unwilling to participate and give informed consent in the study

➤ *Materials Used*• *Tools and Scales:*

- ✓ Consent form
- ✓ Shoulder Pain And Disability Index (SPADI)

- Desired confidence level $(1-\alpha)\% = 95$

➤ *Sample Size Estimation Formula:*

$$n = Z^2 \frac{p(1-p)}{d^2}$$

Where,

- p: Expected proportion
- d: Absolute precision
- $1-\alpha/2$: Desired Confidence level
- ✓ Sampling Technique: Convenient Sampling

- ✓ Pen
- ✓ Paper

➤ *Methods of Measurements*

The SPADI (Shoulder Pain and Disability Index) is a self-report questionnaire that assesses the severity of shoulder pain and its impact on daily activities.

Shoulder Pain and Disability Index (SPADI)

Please place a mark on the line that best represents your experience during the last week attributable to your shoulder problem.

Pain scale

How severe is your pain?

Circle the number that best describes your pain where: 0 = no pain and 10 = the worst pain imaginable.

At its worst?	0	1	2	3	4	5	6	7	8	9	10
When lying on the involved side?	0	1	2	3	4	5	6	7	8	9	10
Reaching for something on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Touching the back of your neck?	0	1	2	3	4	5	6	7	8	9	10
Pushing with the involved arm?	0	1	2	3	4	5	6	7	8	9	10

Disability scale

How much difficulty do you have?

Circle the number that best describes your experience where: 0 = no difficulty and 10 = so difficult it requires help.

Washing your hair?	0	1	2	3	4	5	6	7	8	9	10
Washing your back?	0	1	2	3	4	5	6	7	8	9	10
Putting on an undershirt or jumper?	0	1	2	3	4	5	6	7	8	9	10
Putting on a shirt that buttons down the front?	0	1	2	3	4	5	6	7	8	9	10
Putting on your pants?	0	1	2	3	4	5	6	7	8	9	10
Placing an object on a high shelf?	0	1	2	3	4	5	6	7	8	9	10
Carrying a heavy object of 10 pounds (4.5 kilograms)	0	1	2	3	4	5	6	7	8	9	10
Removing something from your back pocket?	0	1	2	3	4	5	6	7	8	9	10

Fig 1 Shoulder Pain and Disability Index (SPADI) Interpretation

- *Shoulder Pain and Disability Index (SPADI) Interpretation*

Scoring instructions

To answer the questions, patients place a mark on a 10cm visual analogue scale for each question. Verbal anchors for the pain dimension are 'no pain at all' and 'worst pain imaginable', and those for the functional activities are 'no difficulty' and 'so difficult it required help'. The scores from both dimensions are averaged to derive a total score.

Interpretation of scores

Total pain score: _____ / 50 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 40)

Total disability score: _____ / 80 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 70)

Total Spadi score: _____ / 130 x 100 = %

(Note: If a person does not answer all questions divide by the total possible score, eg. if 1 question missed divide by 120)

The means of the two subscales are averaged to produce a total score ranging from 0 (best) to 100 (worst).

Minimum Detectable Change (90% confidence) = 13 points

(Change less than this may be attributable to measurement error)

Fig 2 Scoring Instructions

➤ *General Procedure*

- The approval of the study is obtained from the ethical committee.
- Participants were screened according to the inclusion and exclusion criteria.
- The study procedure was explained and written informed consent was obtained.
- Demographic and occupational details were recorded.
- Shoulder pain and disability were assessed using the Shoulder Pain and Disability Index (SPADI).
- Pain, disability, and total SPADI scores were calculated.
- Data were systematically recorded and statistically analysed.
- The results were interpreted to determine the prevalence of shoulder pain and disability among food delivery riders in Nagpur city.

➤ *Flow Chart for General Procedure*

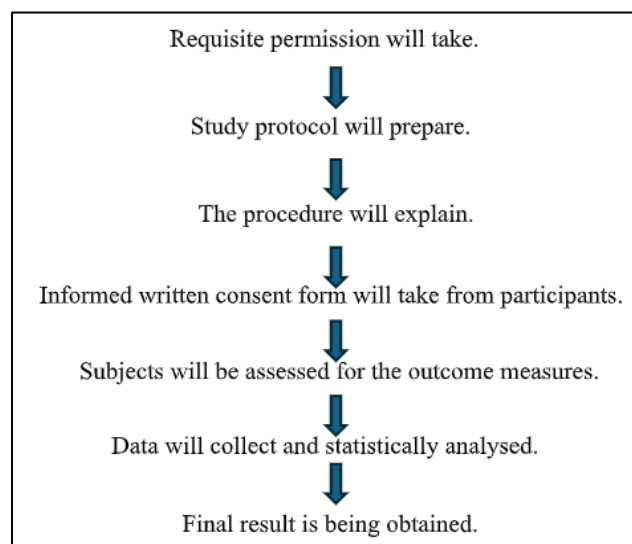
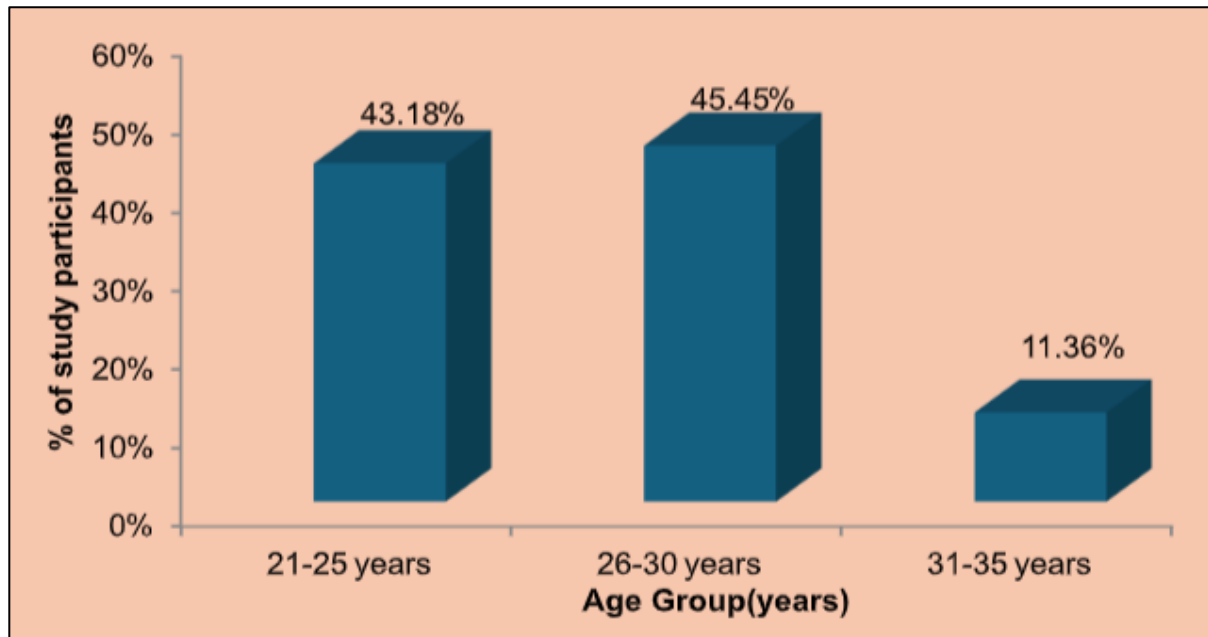


Fig 3 Flow Chart for General Procedure

IV. RESULTS AND TABLES

Table 2 Age Wise Distribution of Study Participants

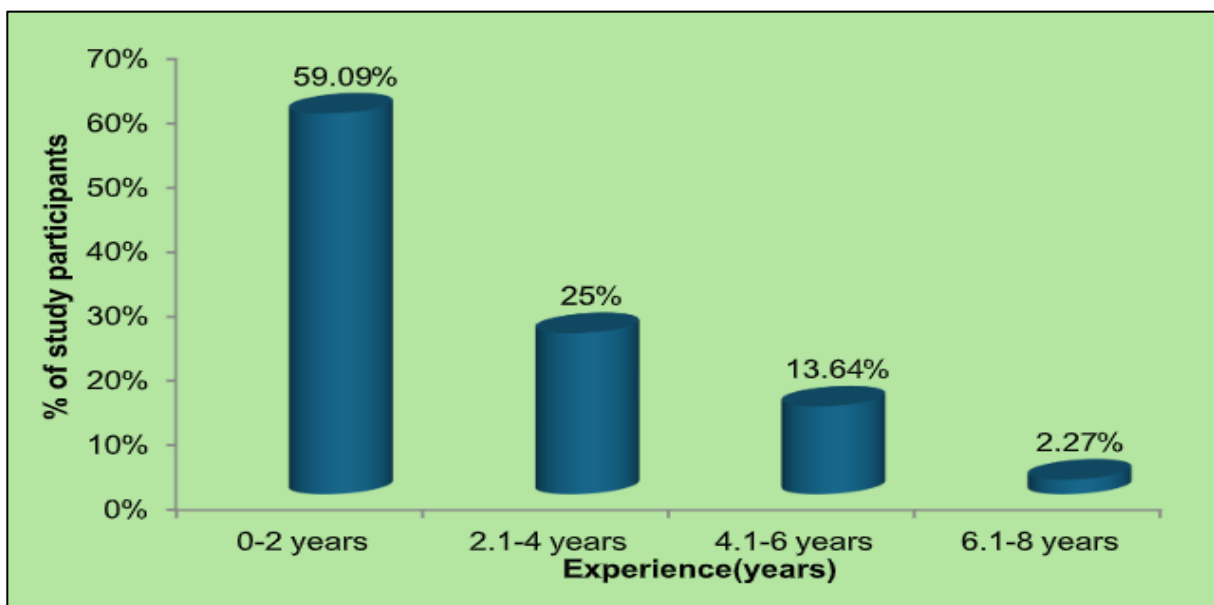
Age Group(years)	No of study participants	Percentage
21-25 years	19	43.18
26-30 years	20	45.45
31-35 years	5	11.36
Total	44	100
Mean±SD	26.18±3.34(21-33 years)	



Graph 1 Age Wise Distribution of Study Participants

Table 3 Distribution of Study Participants According to Experience in Years

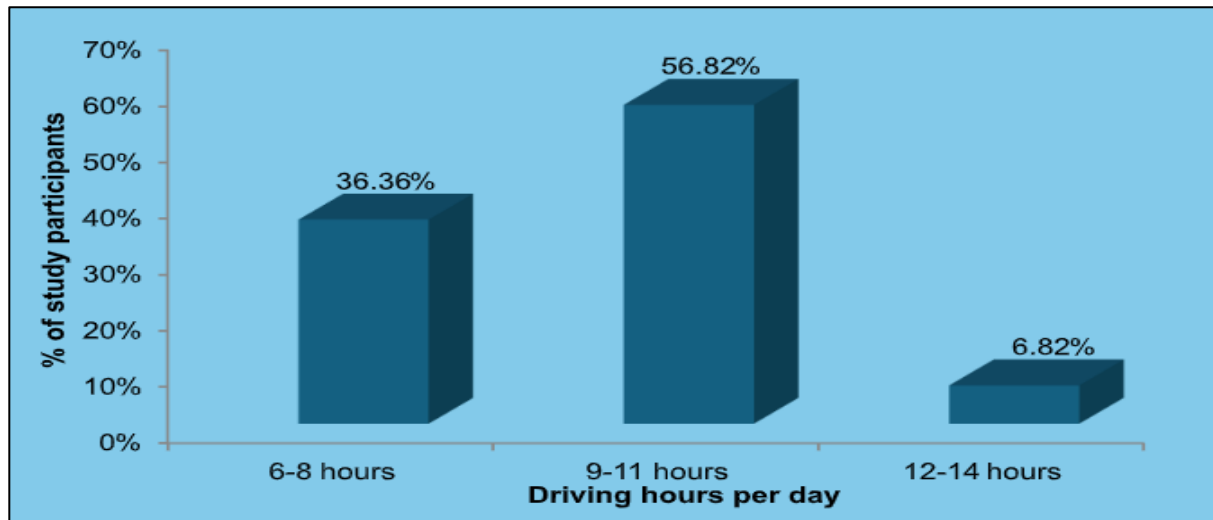
Experience (years)	No of study participants	Percentage
0-2 years	26	59.09
2.1-4 years	11	25
4.1-6 years	6	13.64
6.1-8 years	1	2.27
Total	44	100
Mean±SD	2.49±1.82(0.42-8 years)	



Graph 2 Distribution of Study Participants According to Experience in Years

Table 4 Distribution of Study Participants According to Driving Hours Per Day

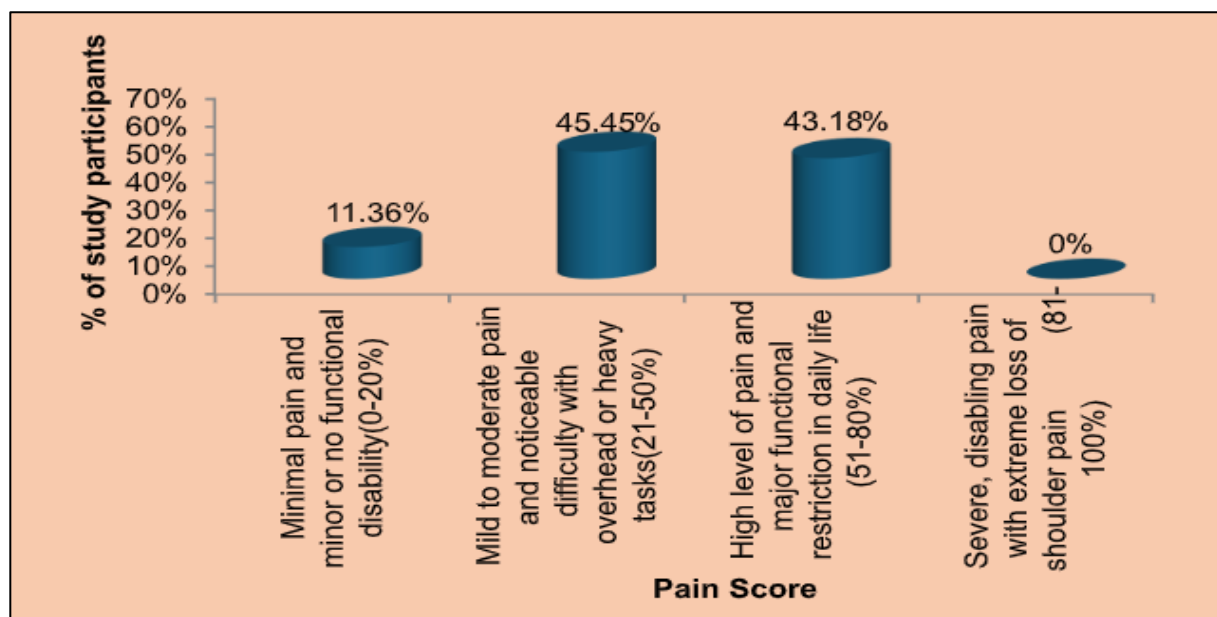
Driving hours per day	No of study participants	Percentage
6-8 hours	16	36.36
9-11 hours	25	56.82
12-14 hours	3	6.82
Total	44	100
Mean±SD	9.02±1.51(6-12 hours)	



Graph 3 Distribution of Study Participants According to Driving Hours Per Day

Table 5 Distribution of Study Participants According to Their Pain Score

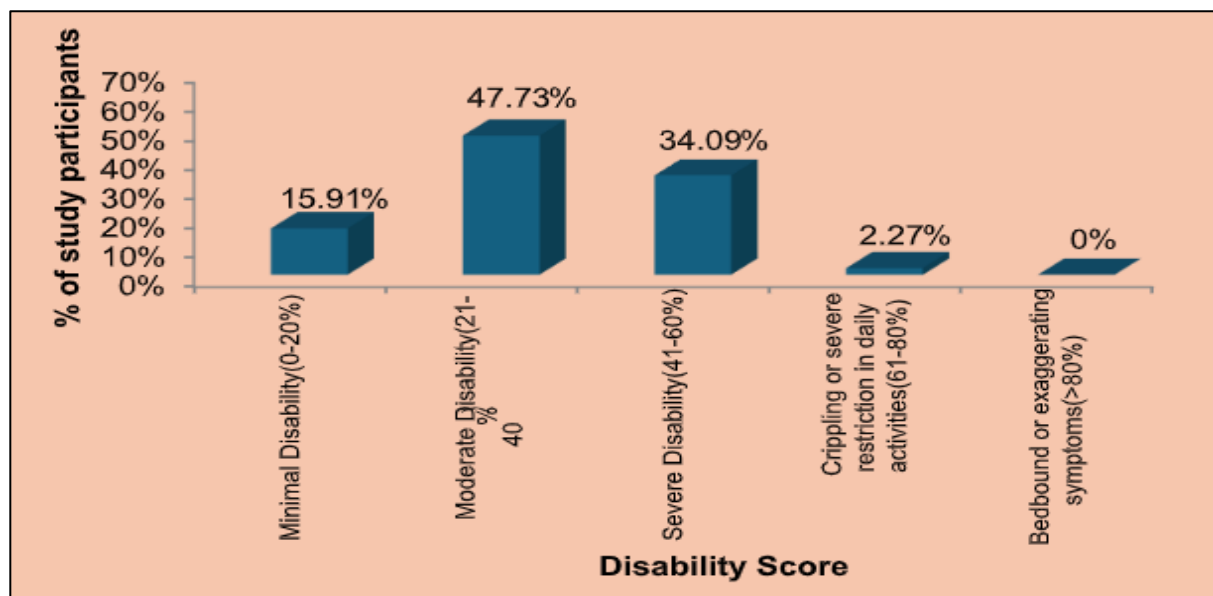
Pain Score	No of study participants	Percentage
Minimal pain and minor or no functional disability (0-20%)	5	11.36
Mild to moderate pain and noticeable difficulty with overhead or heavy tasks (21-50%)	20	45.45
High level of pain and major functional restriction in daily life (51-80%)	19	43.18
Severe, disabling pain with extreme loss of shoulder pain (81-100%)	0	0
Total	44	100
Mean±SD	46.50±18.28(14-80)	



Graph 4 Distribution of Study Participants According to their Pain Score

Table 6 Distribution of Study Participants According to their Disability Score

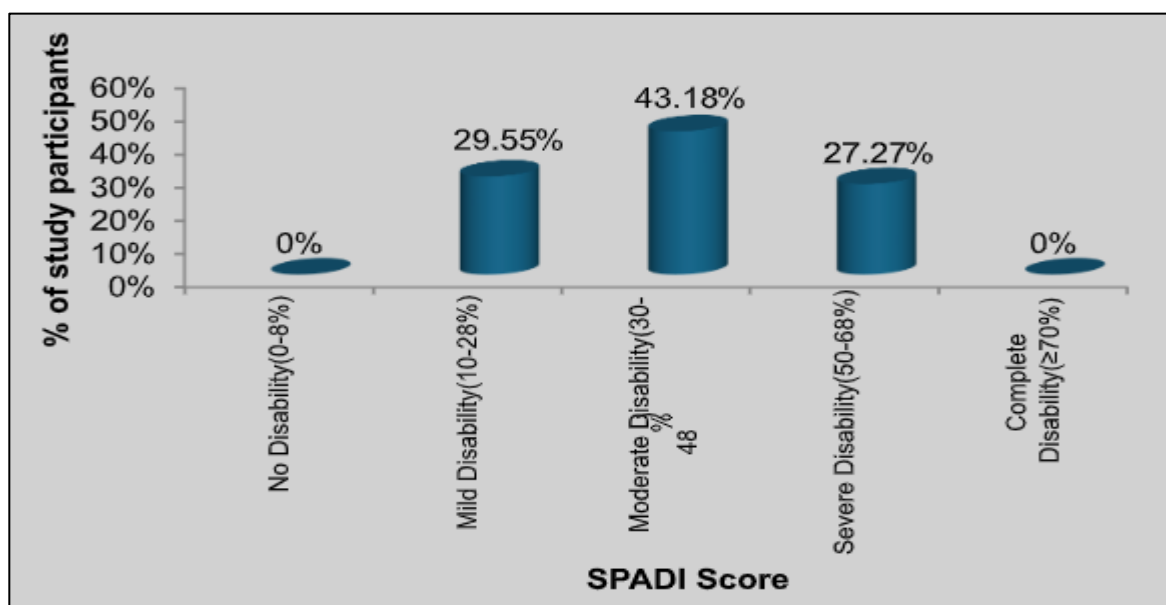
Disability Score	No of study participants	Percentage
Minimal Disability (0-20%)	7	15.91
Moderate Disability (21-40%)	21	47.73
Severe Disability (41-60%)	15	34.09
Crippling or severe restriction in daily activities (61-80%)	1	2.27
Bedbound or exaggerating symptoms (>80%)	0	0
Total	44	100
Mean±SD	34.89±13.92(11.20-61.20)	



Graph 5 Distribution of Study Participants According to their Disability Score

Table 7 Distribution of Study Participants According to their SPADI Score

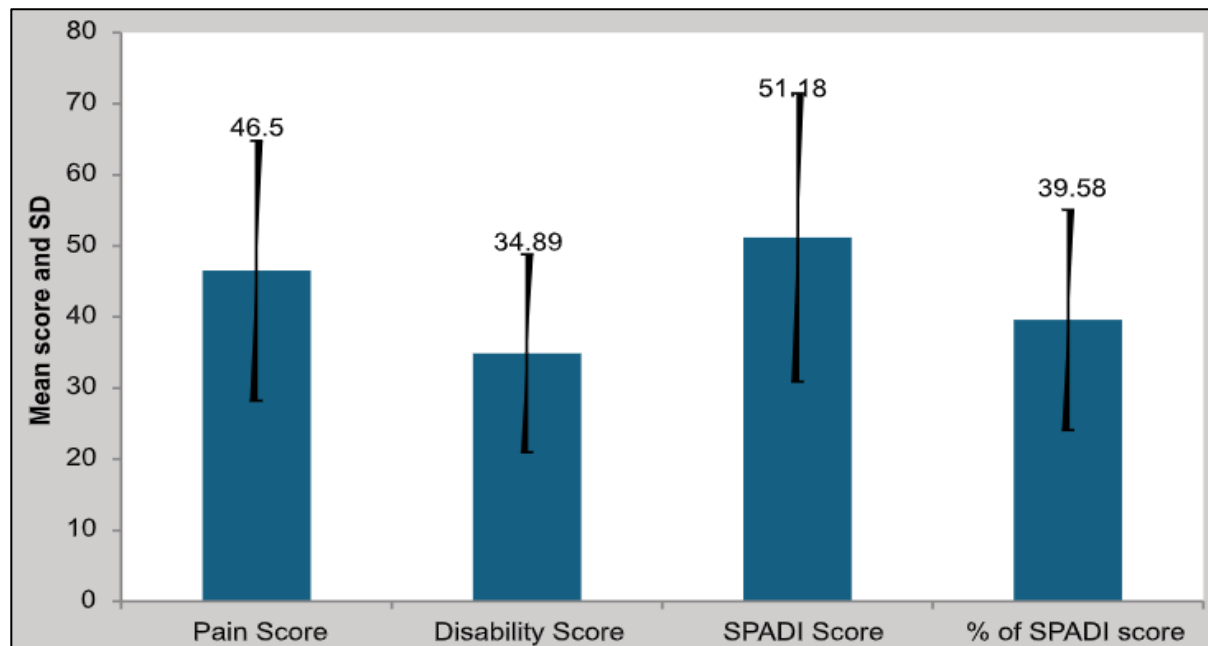
SPADI Score	No of study participants	Percentage
No Pain and Disability (0-8%)	0	0
Mild Pain and Disability (10-28%)	13	29.55
Moderate Pain and Disability (30-48%)	19	43.18
Severe Pain and Disability (50-68%)	12	27.27
Complete Pain and Disability ($\geq 70\%$)	0	0
Total	44	100
Mean $\pm$ SD	51.18 $\pm$ 20.27(16-89)	
% SPADI Score	39.57 $\pm$ 15.49(12.30-68.50)	



Graph 6 Distribution of Study Participants According to their SPADI Score

Table 8 Distribution of Study Participants According to their Pain, Disability SPADI Score and % of SPADI Score

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Pain Score	44	14.00	80.00	46.50	18.28
Disability Score	44	11.20	61.20	34.89	13.92
SPADI Score	44	16.00	89.00	51.18	20.27
% of SPADI score	44	12	69	39.58	15.49



Graph 7 Distribution of Study Participants According to their Pain, Disability SPADI Score and % of SPADI Score

V. DISCUSSIONS

The present study was conducted to assess shoulder pain and disability among food delivery riders in Nagpur City using the Shoulder Pain and Disability Index (SPADI). A total of 44 food delivery riders participated in the study. The participants were assessed according to their age, work experience, daily driving hours, and SPADI scores, including the pain and disability components.

The age-wise distribution showed that the majority of participants belonged to the 26–30 years age group (45.45%), followed by the 21–25 years age group (43.18%), while only 11.36% belonged to the 31–35 years age group. The mean age of the participants was 26.18 ± 3.54 years. These findings indicate that food delivery work is predominantly performed by young adults. Despite the relatively young age of the participants, varying degrees of shoulder pain and disability were observed. This suggests that occupational demands associated with food delivery work may contribute to shoulder-related musculoskeletal symptoms even among younger individuals.

With regard to work experience, the majority of participants (59.09%) had 0–2 years of experience, followed by 25% with 2.1–4 years of experience. The mean work experience was 2.49 ± 1.82 years. This indicates that most participants had relatively limited occupational experience. However, the presence of shoulder pain and disability among the participants suggests that musculoskeletal symptoms may develop during the early years of employment. Prolonged riding, sustained gripping of the handlebars, repetitive upper-limb movements, and exposure to road vibrations may contribute to muscular fatigue and discomfort.

The distribution according to daily driving hours revealed that the majority of participants (56.82%) drove for 9–11 hours per day, while 36.36% drove for 6–8 hours and

6.82% drove for 12–14 hours. The mean daily driving duration was 9.02 ± 1.51 hours. This finding demonstrates that food delivery riders are exposed to prolonged periods of two-wheeler riding as part of their occupation. Prolonged riding requires sustained positioning of the shoulders and upper limbs, continuous gripping of the handlebars, and repetitive movements during steering, braking, and acceleration. Such occupational demands may result in muscular fatigue and increased mechanical stress on the shoulder region.

The pain component of SPADI demonstrated that 45.45% of participants experienced mild-to-moderate pain, while 43.18% experienced a high level of pain. Only 11.36% experienced minimal pain, and none of the participants reported severe disabling pain. The mean pain score was 46.50 ± 18.28 . These findings indicate that shoulder pain was a prominent concern among the study participants. Most participants experienced more than minimal levels of shoulder pain, which may be related to prolonged driving and repetitive upper-limb activity.

Similarly, the disability component revealed that 47.73% of participants had moderate disability, followed by 34.09% with severe disability and 15.91% with minimal disability. Only 2.27% experienced severe restriction in activities. The mean disability score was 34.89 ± 13.92 . These findings suggest that shoulder symptoms were associated not only with pain but also with difficulty in performing functional activities.

The overall SPADI score showed that the highest proportion of participants (43.18%) had moderate disability, followed by 29.55% with mild disability and 27.27% with severe disability. None of the participants were classified as having no disability or complete disability. The mean SPADI score was 51.18 ± 20.27 . These findings indicate that shoulder-related symptoms were associated with varying

degrees of functional limitation among the food delivery riders. The presence of moderate and severe disability among a considerable proportion of participants suggests that shoulder problems may affect their functional activities and occupational performance.

Several occupational factors may contribute to the shoulder pain and disability observed among food delivery riders. These include prolonged two-wheeler riding, sustained gripping of the handlebars, repetitive steering and braking movements, prolonged static posture of the upper limbs, exposure to road vibrations, and long working hours. In the present study, the majority of participants drove for 9–11 hours per day, indicating prolonged occupational exposure. Continuous static muscle activity and repetitive movements may contribute to muscle fatigue and increased stress on the shoulder and surrounding structures.

Overall, the present study demonstrated that shoulder pain and disability were common among the food delivery riders included in the study. Most participants were young adults with relatively limited work experience but were exposed to prolonged daily driving hours. The highest proportion of participants demonstrated moderate disability according to the overall SPADI score, while mild-to-moderate and high levels of pain were also commonly observed. These findings highlight the importance of addressing the musculoskeletal health of food delivery riders through preventive strategies such as proper riding posture, regular rest breaks, ergonomic awareness, and appropriate shoulder strengthening and flexibility exercises. However, as the present study was descriptive and cross-sectional, a direct cause-and-effect relationship between occupational factors and shoulder pain cannot be established. Further research with larger sample sizes is recommended to investigate the relationship between occupational exposure and shoulder-related musculoskeletal problems among food delivery riders.

VI. CONCLUSION

The present study was conducted to assess shoulder pain and disability among food delivery riders in Nagpur City using the Shoulder Pain and Disability Index (SPADI). The study included 44 food delivery riders, most of whom were young adults aged between 21 and 30 years and were exposed to prolonged daily driving hours.

The findings revealed that shoulder-related pain and disability were common among the study participants. The majority of participants demonstrated moderate disability according to the overall SPADI score (43.18%), followed by mild disability (29.55%) and severe disability (27.27%). The mean SPADI score was 51.18 ± 20.27 .

Regarding the pain component, 45.45% of participants experienced mild-to-moderate pain, while 43.18% experienced a high level of pain. The mean pain score was 46.50 ± 18.28 . Similarly, the disability component showed that 47.73% of participants experienced moderate disability,

while 34.09% experienced severe disability, with a mean disability score of 34.89 ± 13.92 .

The findings suggest that the occupational demands of food delivery work, particularly prolonged two-wheeler riding and sustained or repetitive upper-limb activities, may contribute to shoulder-related musculoskeletal symptoms and functional limitations. Therefore, greater attention should be given to the musculoskeletal health of food delivery riders through preventive measures such as ergonomic awareness, proper riding posture, regular rest breaks, and appropriate exercises.

Overall, the study concludes that food delivery riders included in the study demonstrated a considerable burden of shoulder pain and disability, highlighting the importance of early identification and preventive strategies to reduce shoulder-related musculoskeletal problems in this occupational group.

RECOMMENDATION

Regular screening of food delivery riders: Periodic screening for shoulder pain and disability should be encouraged among food delivery riders, particularly those who work for prolonged hours.

Ergonomic education: Riders should be educated regarding proper riding posture, optimal positioning of the shoulders and upper limbs, and appropriate adjustment of the vehicle and delivery equipment to minimize excessive strain on the shoulder.

Work-break strategies: Riders should be encouraged to take short, regular breaks during prolonged working hours. Simple stretching and mobility exercises during these breaks may help reduce muscular fatigue and discomfort.

Preventive exercise programs: Physiotherapists can design simple shoulder, neck, and upper-back strengthening and stretching programs that can be performed regularly by food delivery riders as a preventive measure.

Early identification and management: Riders experiencing recurrent or persistent shoulder pain should be encouraged to seek early physiotherapy assessment to prevent progression of symptoms and functional limitations.

Awareness regarding occupational risk factors: Food delivery companies and riders should be made aware of occupational factors such as prolonged riding, repetitive upper-limb movements, sustained postures, and inadequate rest that may contribute to musculoskeletal complaints.

Further research: Future studies should be conducted with larger sample sizes and participants from different areas to improve the generalizability of the findings. Studies may also investigate the association of shoulder pain with working hours, years of experience, riding posture, workload, type of vehicle, and other occupational factors.

Longitudinal studies: Future longitudinal studies may be undertaken to determine the development and progression of shoulder pain among food delivery riders over time and to evaluate the effectiveness of preventive physiotherapy and ergonomic interventions.

FUTURE SCOPE OF STUDY

Future studies should be conducted with a larger sample size and across diverse geographical locations to obtain a more representative and comprehensive understanding of shoulder pain and disability among food delivery riders. Further research could investigate the association between occupational factors such as riding posture, handlebar ergonomics, duration of continuous riding, and frequency of rest breaks and the development of shoulder disorders. Additionally, future investigations may examine individual variables, including physical activity levels, prior musculoskeletal injuries, type of two-wheeler used, weight and load distribution of delivery bags, and the specific habit of carrying backpacks on one or both shoulders.

Additionally, future studies may focus on identifying the specific nature and types of functional disabilities experienced by food delivery riders, including difficulties in activities such as lifting, carrying, reaching, pushing, and pulling. Such research may provide a better understanding of the functional limitations associated with shoulder pain and assist in developing appropriate preventive, ergonomic, and physiotherapeutic interventions for this occupational group.

REFERENCES

- [1]. Benson TM, Sathiyarajeswaran NS, Radhakrishnan R, et al. Factors and prevalence of musculoskeletal pain among the app-based food delivery riders in Tamil Nadu: a cross-sectional study. *Discov Soc Sci Health*. 2025;5:14.
- [2]. Samad NI, Maridin AF, Hamzah NA, Anua SM, Mamat MN, Nawati MN. Prevalence of back pain among food delivery riders in Kota Bharu, Kelantan: a preliminary study. *J Energy Saf Technol*. 2023;5(2):52-60.
- [3]. Tembhurne S. Prevalence of riding related musculoskeletal disorders and disability among motorcyclists in Pune region: a cross-sectional study. *Galore Int J Appl Sci Humanit*. 2025;9(2):59-68.
- [4]. Anoop GA, Binoosh SA. A study on musculoskeletal disorders among two-wheeler riders of Kerala state in India. *Kerala Technol Cong KETCON*. 2019;6:411-8.
- [5]. Chitrarasu K, Sathish K. Outcome of activity modification in management of mechanical low backache among the motorbike drivers in delivery service. *Int J Res Med Sci*. 2021;9(8):2300-2305.
- [6]. Pandis P, Prinold JA, Bull AM. Shoulder muscle forces during driving: sudden steering can load the rotator cuff beyond its repair limit. *Clin Biomech*. 2015;30(8):839-846.
- [7]. Panumasvivat J, Surawattanasakul V, Kwangsukstith S, Mahakkanukrauh C, Kiratipaisarl W. The relationship between working conditions, vehicle factors, and work-related musculoskeletal disorders affecting job satisfaction and job stress among motorcycle food delivery riders. *Int J Hyg Environ Health*. 2025;267:114594.
- [8]. MacDermid JC, Solomon P, Prkachin K. The Shoulder Pain and Disability Index demonstrates factor, construct and longitudinal validity. *BMC Musculoskelet Disord*. 2006;7:12.
- [9]. van der Heijden GJ, Leffers P, Bouter LM. Shoulder disability questionnaire design and responsiveness of a functional status measure. *J Clin Epidemiol*. 2000;53(1):29-38.
- [10]. Chawathe VS, Mhambre AS, Gaur AK, Pusnake VJ, Sharma R, Wangdi NI. Prevalence of pain in medical representatives using two-wheeler for daily commute. *J Musculoskelet Ultrasound Pain Med*. 2017;3(2):61-65.
- [11]. Yahya M, Kiran Q, Shaukat S, Naveed M, Tariq U, Bilal M. Prevalence of low back pain and physical disability in food delivery riders. *Med J South Punjab*. 2025;6(4):17-24.
- [12]. Amod B, Shubhangi A, Sandeep G, Prashant T. Study of occupational factors associated with low back pain in truck drivers of Nagpur city, India. *Int J Med Health Sci*. 2012;1(3):53-60.
- [13]. Alrashidi Y, Sriram S, Beek MA, Fadlalmola HA, Albadrani M. Work-related musculoskeletal disorders among gig-based food delivery workers: a systematic review and meta-analysis. *Front Public Health*. 2026;14:1788523.
- [14]. Joseph L, Standen M, Paungmali A, Kuisma R, Sitalertpisan P, Pirunsan U. Prevalence of musculoskeletal pain among professional drivers: a systematic review. *J Occup Health*. 2020;62(1):e12150.
- [15]. Khera S, Lokras S, Np K, Gitte SV. Musculoskeletal health and mental wellbeing of occupational two-wheeler delivery drivers from Mumbai metropolitan region. *Indian J Med Res*. 2026;164(1):153-155.