

Prevalence of Work-Related Musculoskeletal Disorders and its Association of Stress among Food Delivery Personnel of Gujarat - A Cross-Sectional Analytical Study

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Abstract: ***Background:** The online food delivery sector in India delivers goods and food to clients via motorcycle. The constant usage of motorcycles makes riders more vulnerable to musculoskeletal conditions such as disc dislocation, lower back discomfort, and spine damage. Another prevalent musculoskeletal condition among riders of motorbikes that is connected to driving is lower back pain. The main purpose of the study was to determine the prevalence of Work-related musculoskeletal disorders (WRMSD) and their association with stress among food delivery personnel. **Methodology:** This present study evaluates the prevalence of WRMSDs and the association of stress in food delivery personnel. 225 food delivery personnel gave responses in the study, whereas, the data were collected through the survey analysis, they were asked to fill up the questionnaires. **Result:** 225 food delivery personnel gave a response in the study, among them 37% reported having symptoms of musculoskeletal system disorder in at least one body part. The most frequently reported areas were the Low back (49%), proceeded by Neck (45.5%), most affected. The stress level was, 15 (6.7%) had mild stress, 199 (88.4%) had moderate stress level, and 11 (4.9%) had severe stress in a food delivery personnel while doing their services. **Conclusion:** Current study concluded that 37% of delivery personnel are suffering from WRMSD region-wise distribution is mainly in the low back (49%), and neck (45.5%). The same population are having a moderate amount of stress.*

Keywords: Work-related musculoskeletal disorders (WRMSDs), Work-related Stress, Food delivery Personal.

1. Introduction

The food market is one of the market's fastest-growing segments and the food delivery industry is predicted to generate USD 956 million in yearly sales by the year 2022.1 Southeast Asia has a big market for meal delivery services. Although the food industry is a trillion-dollar industry, just a small portion of this market is the delivery industry.2 Companies that allow consumers to buy food online provide a variety of alternatives and conveniences that let customers have their favorite food at their fingertips.3

The online food delivery sector in India delivers goods and food to clients via motorcycle. Motorcycles are very important for daily tasks including transportation, mobility, commerce, and sports. The constant usage of motorcycles makes riders more vulnerable to musculoskeletal conditions such as disc dislocation, lower back discomfort, and spine damage. Another prevalent musculoskeletal condition among riders of motorbikes that is connected to driving is lower back pain. Lower back pain, spinal injuries, and vehicle body vibration are all strongly linked to WRMSD. Compared to drivers of cars, motorcyclists are comparatively more vulnerable to the dangers of poor seating position. Shoulder and neck are the most common regions to be affected in motorbike users.4 The sitting posture is one of the causes that lead to shoulder and neck problems to those using motorcycle very frequently. Sitting without back support generate pain in lower back as well as central back accordingly.5 Unique evaluations in the area of

work and machine ergonomics are the impression of comfort and discomfort.6 Sitting posture may lead to discomfort motorbike rider and it can be related to body parts. Usually, uncomfortable posture is the sign that is responsible for several kind of musculoskeletal disorders.7

Work-related musculoskeletal disorders (WRMSDs) are impairments of body structures such as muscles, joints, tendons, ligaments, nerves, bones and the localised blood circulation system, that are caused or aggravated primarily by work and by the effects of the immediate environment in which work is carried out.8 When a worker's physical capabilities do not match the physical demands of the job, they develop work-related musculoskeletal diseases (WRMSDs).9 There is epidemiological and psychophysiological evidence implicating work-related mental stress in the development of WMDs.10 When employees experience failure at work, they are prone to feel stressed.11

There is a dearth of literature that clearly demonstrates WRMSD, its regional distribution, and the stress that it causes among delivery workers. Determining the prevalence of WRMSD and work-related stress among delivery personnel in the Two Gujarat regions was the goal of the current study.

2. Methodology

2 cities of the Gujarat region, from September 2022 to

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February 2023, a cross-sectional analytical study involving 225 food delivery workers was carried out. Participants were included whose age was between 18 to 45 years, have at least one year of food delivery service experience, and travel at least 60-7 km per day. Participants were excluded if they had undergone surgery for a musculoskeletal disorder during the previous year, had a comorbid condition, or a musculoskeletal disorder of non-occupational origin.

3. Data Collection Procedure

After taken permission from the department, we started collecting data. Data mainly covered the food delivery personnel of Vadodara and Bharuch City. The duration for collecting data was from September 2022 to March 2023. We asked for the permission of the higher authorities of particular food delivery Service Company and asked for able to gather the data from the personnel. They evaluated our survey and gave the permission. The link was sent to the main group of food delivery personnel by the manager of the company, manager asked them to support our study as well as to show concern related to the survey. The survey included a consent form, only after they accept the consent form the person can go ahead with the questionnaire and they would be able to fill it up. Furthermore, we have taken different questionnaires in our survey like the Nordic scale, and perceived stress scale, the personnel are given 15-20 minutes to fill it and up, and they were convinced that their data are safe.

Outcome measures

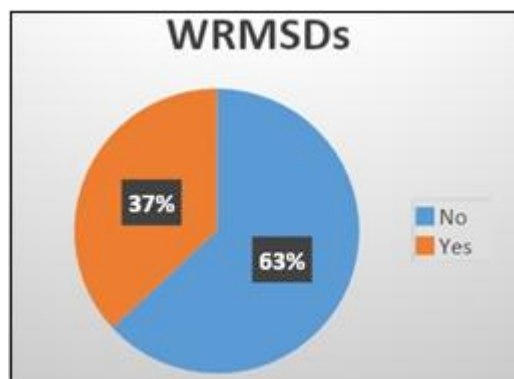
The Nordic musculoskeletal questionnaire aids to measures musculoskeletal pain and activity prevention. The NMQ were administered through self-completion and in-person interviews, and it gathers accurate data on the onset, prevalence, and effects of musculoskeletal pain. The Perceived Stress Scale (PSS) is a well-known tool for measuring stress. This scale asks you about your emotions and ideas from the previous month.

Statistical Analysis

Demographic data and joint-wise distributions were analysed by descriptive statistics and the association of stress with WRMSDs was analysed by chi-square test using IBM SPSS Statistics version 29.0. The level of significance was kept at $p < 0.05$.

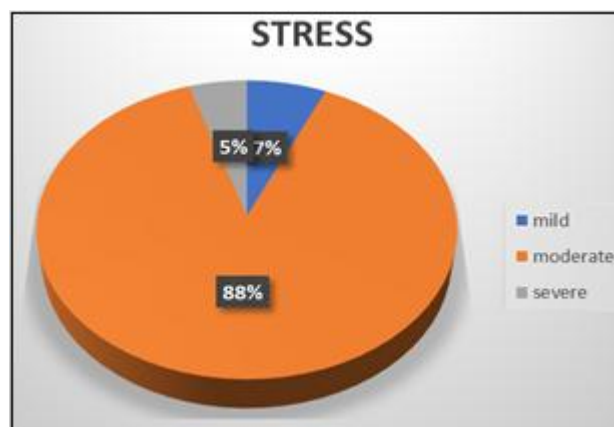
4. Result

The presences of WRMSDs were 37 among the food delivery personnel.



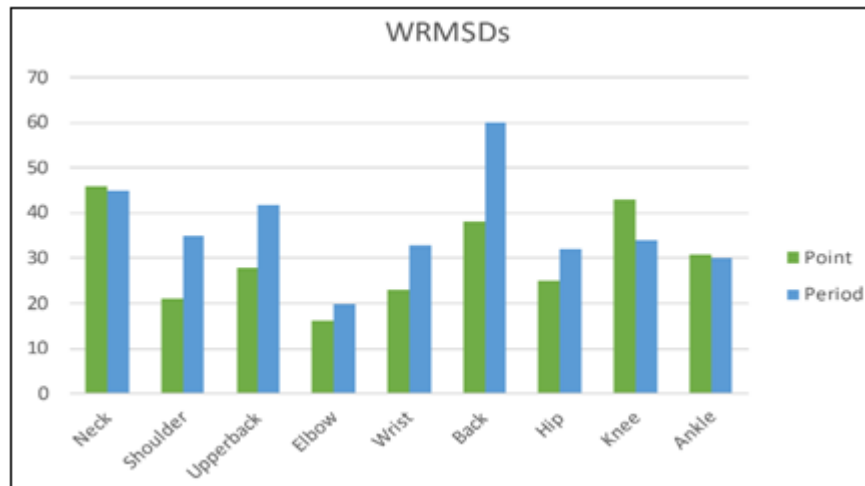
Graph 1: Distribution of WRMSDs among food delivery personnel

Graph 2 shows the significant amount of stress distributed among the food delivery personnel into three categories with mild stress 7%, Moderate stress 88%, and severe stress 5%



Graph 2: Distribution of stress among food delivery personnel

37% of the food delivery personnel suffer Work-Related Musculoskeletal Disorders in their occupational lives. The 12 months period and the point prevalence rate of work-related musculoskeletal disorder involving any other regions of the body are shown in below bar graph (graph no.3). Work-related musculoskeletal disorders are mainly seen in Low back (49%), Neck (45.5%), Knees (38.5%), Upper back (35%), Ankle (30.5%), Hip (28.5%), Shoulder (28%), Wrist (28%), Elbow (18%).



Graph 3: Distribution of point and period prevalence of WRMSDs at different regions of the body

Table 1: Distribution of food delivery personnel characteristics as individual factors and WRMSDs

Individual Factors	Data	No. Participant n=225	Percentage
Age	18-24	82	36.4
	25-34	105	46.7
	35-45	38	16.9
Address	Vadodara	86	38.2
	Bharuch	139	61.8
Qualification	Primary Education	26	11.6
	SSC	55	24.4
	HSC	72	32
	Graduates	72	32
Work Experience	1 year	88	39.1
	2 to 5 years	122	54.2
	6 to 10 years	15	6.7
Workdays	7 days/week	110	48.9
	6 days/week	99	44
	5 days/week	16	7.1

Given Table 1 shows the distribution of individual factors like age, address, qualification, work experience, and workdays, with WRMSDs in the total numbers of 225 food delivery personnel, into the relevant of data, no. of participants and percentages.

Table 2: Association between Individual Factors and WRMSDs among Food Delivery Personnel

Individual Factors	Data	Frequency	WRMSDs (Yes)	WRMSDs (No)	P-Value
Age	18 to 24	18-24	32	50	0.868
	25 to 34	25-34	37	68	
	35 to 45	35-45	14	24	
Address	Vadodara	86	22	64	0.006
	Bharuch	139	61	78	
Qualification	Primary education	26	83	142	0.58
	SSC	55	11	15	
	HSC	72	21	34	
	Graduates	72	29	43	
Work Experience	1 year	88	22	50	0.018
	2 to 5 years	122	25	63	
	6 to 10 years	15	55	67	
Workdays	7 days/week	110	3	12	0.053
	6 days/week	99	32	78	
	5 days/week	16	43	56	
Stress	Low stress	15	4	11	0.534
	Moderate stress	199	76	123	
	High-perceived stress	11	3	8	

Given table 2 is illustrating the association of individual factors with WRMSDs and stress, Thus, the variables like age, qualification, workdays, and work experience are discovered to have a minimal association with it, which are insignificant to the service of food delivery personnel.

5. Discussion

The aim of the study was to identify the percentage and various risk factors for work-related musculoskeletal disorders among the food delivery personnel from the Vadodara and Bharuch Cities of Gujarat. The survey questionnaire form was created on google forms, where, The NMQ Scale and PSS were administered to food delivery personnel.

There was a total of 225 food delivery personnel were recruited for the study purpose, whereas, the data are collected through survey analysis (google form); they are asked to fill up the respective questionnaires. A study elicits that 37% of food delivery people (n=225) have reported having symptoms of musculoskeletal system disorder in at least one body part. The most frequently reported areas were the Low back (49%), proceeded by Neck (45.5%), Knees (38.5%), Upper back (35%), Ankle (30.5%), Hip (28.5%), Shoulder (28%), Wrist (28%), and Elbow (18%). It has been shown that the lower back is the major cause of showing symptoms and the leading to develop detrimental disorders of the musculoskeletal system. One of the studies explored the incidence and potential risk factors of musculoskeletal disorders among food delivery boys. There is 100 participants were included in which they show the highest per cent of lower back pain (38%), then come neck (18%), knee (17%), lower leg (14%), upper back (12%), hip (12%), thigh (12%), shoulder (10%), upper arm (7%), wrist (6%), forearm (4%), and feet (4%).⁴ Stated study's result shows less amount of percentage for the lower back region than our study's findings which can be due to long hours of working.¹²

Analysis of association between the WRMSDs and the individual factors-age, qualification, work experience, workdays, and as well as stress and fatigue-related symptoms. The result shows not a single personal factor is a significant match of statistical data of association of WRMSD with any other variable in our study. Whereas a study has found stress and fatigue are correlated with the food delivery personnel and affect most of their lives. According to a 2015 study by the National Council for Occupational Safety and Health of thousands of American fast food delivery riders and crewmembers, 75% of these workers experience burnout or had experienced it more than once in the previous years.¹³

In our study, work-related stress factor which was measured by using of perceived stress scale (PSS), evaluate that, only 15 (6.7%) have mild stress, 199 (88.4%) have moderate stress level, 11 (4.9%) with severe stress in a food delivery personnel while doing their services. In which there is no significant relationship has been found between the WRMSDs and PSS. A controversial study found that job performance and job stress are associated; the study's conclusion was that food delivery executives experience stress regardless of when they work. Positive (54%) and negative (46%) coping techniques make up the majority of the stress-reduction strategies.¹⁴ However, there is no relevant studies have been done on the relation between the WRMSDs and stress on food delivery personnel.

Our statistical analysis found that food delivery personnel are facing a moderate amount of stress but there is insignificant association of any personal variable with WRMSDs. There should be other factors, which lead to a musculoskeletal disorder affected to the bodies of the occupational food delivers. Thus, there have been not many studies done related to WRMSDs and the association of stress with it among food delivery personnel.

6. Limitations

- Small sample size (more excluded from the study)
- Lack of time for filling up the data for the research.
- Not able to cover the whole population as well as the cities of Gujarat.

7. Conclusion

From the current study, we are able to conclude that 37% of delivery personnel are suffering from WRMSD, which is considerably low in proportion region-wise distribution, is mainly seen in low back (49%), neck (45.5%), knees (38.5%), upper back (35%), ankle (30.5%), hip (28.5%), shoulder (28%), wrist (28%), and elbow (18%). The same population are having a moderate amount of stress.

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