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Original Research Article

Prevalence of musculoskeletal disorders in delivery personnel

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ABSTRACT

Background: Musculoskeletal problems are widespread in the elderly, but they are also becoming more common in the younger population as a result of changes in lifestyle and employment. In this study we will be assessing the musculoskeletal disorders in delivery personnel.
Methods: 200 delivery personnel took part in an offline survey at several e-commerce companies' delivery hubs as part of this observational study, based on inclusion and exclusion criteria. In addition to questions from the Nordic Questionnaire, the form included basic demographic information.
Results: The current study showed that the musculoskeletal pain in the last 12 months showed the prevalence was higher for lower back 60(30%) followed by 18(9%) for neck. The seven days prevalence showed 43(21.5%) for lower back followed by 11(5.5%) for neck. Prevention to do the work due to the pain in last 12 months showed highest percentage of the respondents experienced it due to lower back pain. The statistics further showed majority of people who had musculoskeletal pain from last 12 months were working for more than 8 hours per day (52.3%).
Conclusions: We can conclude that MSDs are common in all three groups, namely pain in the past year, pain in the past week, and activity prevention. This incidence demonstrates that MSDs can impact delivery personnel even at younger ages, which can be avoided by reducing workload and observing adequate safety procedures while working.

Keywords: Delivery personnel, Musculoskeletal disorders, Nordic musculoskeletal questionnaire, Prevalence

INTRODUCTION

Muscle, joint, tendon, ligament, and nerve impairments that are caused on or are worsened by job activities and the immediate environment in which those activities are performed are known as work-related musculoskeletal disorders (WRMSDs).[1] These include less standardized conditions such as myalgia, low back pain and other regional pain syndromes not attributable to known pathology. Body regions most commonly involved are the low back, neck, shoulder, forearm, and hand, although recently the lower extremity has received more attention.

MSDs are the top occupational health risk in the developed world, accounting for up to 30% of all injuries requiring time away from work.[2] Several epidemiological studies have demonstrated evidence of a causal relationship between physical exertion at work and work-related musculoskeletal disorders (WRMSDs).[3] MSDs are the single largest category of work- related illness, representing a third or more of all registered occupational diseases in the United States, the Nordic countries, and Japan.[4-6]

High prevalence of WRMSDs, which vary from 53% to 91%, has been reported among drivers in different parts of the world. This is reportedly linked to risk factors that include seat discomfort, exposure to whole-body vibration, long driving time, non-neutral postures, heavy lifting, manual materials handling, and psycho-social

factors.[7] In addition to the bio- mechanical and ergonomic risk factors associated with driving, motorcyclists are exposed to a variety of other hazards including fatigue, pollution from other vehicles, and physical harm due to noise, motion and vibration.[8]

In the platform economy, food aggregators such as Zomato and Swiggy are particularly prominent cases in India.[9,10] On-demand food delivery is increasingly becoming popular, exhibiting rapid growth (with a 25-30 per cent compound annual growth rate) and estimated to become an $8 billion market by 2022. Food delivery workers managed by these platform aggregators thus represent a large gig workforce. However, due to the COVID-19 crisis, the entire food delivery workforce associated with food aggregators has faced the loss either of their entire livelihood or of a good part of their income.

The food aggregators describe their food delivery workers as "platform partners", which emphasizes that they are associated with them only on a day-to-day basis. These delivery workers are treated as entrepreneurs. This strategy of treating food delivery work as an entrepreneurial venture shifts the risk and labor costs onto the workers. In the context of the COVID-19 pandemic, this has had particular pernicious effects, because it has created a situation in which food delivery workers are seen as independent individuals experiencing problems due to the pandemic, absolving the food aggregators from any responsibility to provide socioeconomic support.

In India, food delivery workers associated with digital platforms are not regulated by labor law and the work arrangements between platform and workers do not fall into the traditional employer–employee relationship. This is because these platforms aggregators do not recognize food delivery workers as employees, rather terming them as "delivery partners". This allows companies to avoid compliance with labor laws and reduces the labor cost. For example, companies do not need to pay wages, as food delivery workers are partners; they are only paid delivery charges and incentives.

In this study we will be observing these "delivery personnel" from various delivery hubs situated in and around Bangalore for any musculoskeletal disorders by using Nordic Musculoskeletal Questionnaire (NMQ) as outcome measure. The Nordic Musculoskeletal Questionnaire (NMQ) was developed from a project funded by the Nordic Council of Ministers.[11] The reliability of the NMQ, using a test–retest methodology, found the number of different answers ranged from 0 to 23%. Validity tested against clinical history and the NMQ found a range of 0 to 20% disagreement. The authors concluded this was acceptable in a screening tool.[11]

The NMQ can be used as a questionnaire or as a structured interview. However, significantly higher frequencies of musculoskeletal problems were reported when the questionnaire was administered as part of a focused study on musculoskeletal issues and work factors than when administered as part of a periodic general health examination.[12]

METHODS

This study was conducted on 200 male delivery personnel. The responses were recorded using Nordic Questionnaire form at various delivery hubs of food, daily needs and groceries aggregators like Swiggy, Dunzo, Blinkit, Zepto etc., situated in and around Bangalore. Delivery hubs in charges were approached through the official letter given by my institution, requesting permission to record responses of the delivery personnel working in their respective hub. Instructions to fill the form were given, the questionnaire was explained and the results were recorded based on the inclusion and exclusion criteria. The questionnaire was self-administered, personally distributed and collected.

This was a 6 months (June 2022 to December 2022) observational study with 200 male delivery personnel aged between 18 to 40 years. Convenient sampling method was used. Delivery personnel from various delivery hubs located in and around Bangalore.

Inclusion criteria

Male delivery personnel aged between 18-40 years. Minimum 1 year of work experience. No previous history of diagnosed musculoskeletal disorders.

Exclusion criteria

Female delivery personnel. Less than 1 year of work experience. History of diagnosed musculoskeletal disorder.

Statistical analysis

The data was done by using the software SPSS23.0. Descriptive statistics were calculated and summarized. This includes frequency, percentage, Mean and standard deviation.

RESULTS

The Table 1 depicts, the study was conducted on 200 male delivery personnel. The average age was 26.45±7.34 years. Majority of 76 (385) were between age 21 to 25 years followed by 40 (20%) below 20 years and 37 (18.5%) were of 31 years or more. Minimum age found was 18 years and maximum were 40 years. The work experience shows, majority of 114 (575) had of 13 to 24 months experience followed by 71 (35.5%) less than or equal to one year and 15 (7.55) had more than 25 months experience. Distribution of working hours per day shows, 115 (57.5%) worked more than 8 hours per day and 85 (42.5%) worked for less than or equal to 8 hours per day.

Table 1: Baseline characteristics of the delivery personnels.

Base line characteristics		Frequency	Percent
Age (in years)	≤20	40	20.0
	21-25	76	38.0
	26-30	37	18.5
	≥31	47	23.5
Gender	Male	200	100.0
Experience	≤12 months	71	35.5
	13 -24 months	114	57.0
	≥25 months	15	7.5
Working hours	≤8 hours	85	42.5
	>8 hours	115	57.5
	Total	200	100.0

Data on musculoskeletal pain in the last 12 months showed, prevalence was high for lower back 60 (30%) followed by 18 (9%) for neck, 17 (8.5%) for shoulder (2% bilateral,1% left side and 4.5% right side), 11 (5.55) for upper back and less than 5% prevalence was seen in elbow (2.5% right side), wrist/hand (1% bilateral, 0.5% left side and 2.5% right side), Hips/Thighs/Buttocks, knees and Ankle/feet.

The seven days prevalence showed 43 (21.5%) for lower back followed by 11 (5.5%) for neck and rest all the body parts included had prevalence less than 5% (1.5% right side shoulder, 0.5% each for bilateral, right, left was seen in wrist/hand). Prevention to do the work due to the pain in last 12 months showed highest percentage of the respondents experienced it due to lower back pain.

Table 2: Response based on parts of the body affected in last 12 months, trouble in last 7 days and prevention to do the work from last 12 months.

		Trouble in last 12 months		Trouble in last 7 days		Prevention to do the work from last 12 months	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Neck	No	182	91.0	189	94.5	196	98.0
	Yes	18	9.0	11	5.5	4	2.0
Shoulder	No	183	91.5	194	97.0	195	97.5
	Yes	17	8.5	6	3.0	5	2.5
Elbow	No	194	97.0	199	99.5	199	99.5
	Yes	6	3	1	.5	1	0.5
Wrist/hand	No	192	96.0	195	97.5	199	99.5
	Yes	8	4.0	5	2.5	1	0.5
Upper back	No	189	94.5	193	96.5	198	99.0
	Yes	11	5.5	7	3.5	2	1.0
Lower back	No	140	70.0	157	78.5	186	93.0
	Yes	60	30.0	43	21.5	14	7.0
Hips/thighs/buttocks	No	198	99.0	195	97.5	198	99.0
	Yes	2	1.0	5	2.5	2	1.0
Knees	No	193	96.5	197	98.5	199	99.5
	Yes	7	3.5	3	1.5	1	0.5
Ankle/feet	No	197	98.5	199	99.5	200	100.0
	Yes	3	1.5	1	.5		

Table 3: Cross tabulation of musculoskeletal pain from past 12 months and number of hours of duty.

Duty		Musculoskeletal pain		Total
		No	Yes	
Hours/day	<=8	44	41	85
		38.6%	47.7%	42.5%
	>8	70	45	115
		61.4%	52.3%	57.5%
Total		114	86	200
		100.0%	100.0%	100.0%

The Table 3 shows in the present study, majority of the people who had musculoskeletal pain from last 12 months were working for more than 8 hours per day (52.3%).

Table 4: Cross tabulation of prevention from activities from past 12 months and number of hours of duty.

Duty		Prevention from activities due to musculoskeletal pain		Total
		No	Yes	
Hours/day	≤8	78	Hours/day	<=8
		44.8%	47.7%	42.5%
	>8	96	45	>8
		55.2%	52.3%	57.5%
Total		174	26	Total
		100.0%	100.0%	100.0%

The Table 4 depicts those who experienced prevention of activity due to musculoskeletal pain were working for more than 8 hours per day (73.1%).

Table 5: Prevalence rate of pain in last 12 months, last 7 days and Prevention from activity from last 12 months.

		Frequency	Percent
Last 12 months	No	114	57.0
	Yes	86	43.0
Last 7 days	No	140	70.0
	Yes	60	30.0
Prevention from activity from last 12 months	No	174	87.0
	Yes	26	13.0

The prevalence rate of musculoskeletal pain was 43% in the last 12 months, 30% in last 7 days and 13% respondent experienced prevention of activities in last 12 months.

DISCUSSION

Musculoskeletal disorders or MSDs are injuries and disorders that affect the human body's movement or musculoskeletal system. MSDs are also known as "Repetitive motion injury" or "Repetitive stress injury". When a worker is exposed to MSDs, they begin to fatigue on work. When fatigue outruns their body's recovery system, they develop a musculoskeletal imbalance over time. As fatigue continues to outrun recovery and the musculoskeletal imbalance persists, a musculoskeletal disorder develops.

While the prevalence of musculoskeletal conditions increases with age, younger people are also affected, often during their peak income-earning years. The low back pain is the main reason for a premature exit from the workforce followed by neck pain.

A recent analysis of Global Burden of Disease (GBD) 2019 data showed that approximately 1.71 billion people globally live with musculoskeletal conditions, including low back pain, neck pain, fractures, other injuries, osteoarthritis, amputation and rheumatoid arthritis.[13] While the prevalence of musculoskeletal conditions varies by age and diagnosis, people of all ages everywhere around the world are affected. Notably in the Covid pandemic era the online aggregators have seen a sharp rise in demand and as a result the work load on delivery personnel has increased. Due to this increased work load they are getting exposed to various MSDs. The purpose of this study is to find out the prevalence of musculoskeletal disorders in delivery personnel. This study was conducted on 200 male delivery personnels. The responses were recorded at various delivery hubs of food, daily needs and groceries aggregators like Swiggy, Dunzo, Blinkit, Zepto etc., using the Nordic musculoskeletal questionnaire form. The NMQ can be used as a questionnaire or as a structured interview, which comprises of Section 1: a general questionnaire of 40 forced-choice items identifying areas of the body causing musculoskeletal problems. Completion is aided by a body map to indicate nine symptom sites being neck, shoulders, upper back, elbows, low back, wrist/hands, hips/thighs, knees and ankles/feet. Respondents are asked if they have had any musculoskeletal trouble in the last 12 months and last 7 days which have prevented normal activity. Section 2: additional questions relating to the neck, the shoulders and the lower back further detail relevant issues. Twenty-five forced-choice questions elicit any accidents affecting each area, functional impact at home and work (change of job or duties), duration of the problem, assessment by health professional and musculoskeletal problems in the last 7 days. Results were documented and master chart was made.

Statistical analysis showed the average age was 26.45±7.34 years. Majority of 76 (385) were between age 21 to 25 years followed by 40 (20%) below 20 years and 37 (18.5%) were of 31 years or more .Minimum age found was 18 years and maximum was 40 years. The work experience shows, majority of 114 (575) had of 13 to 24 months experience followed by 71 (35.5%) less than or equal to one year and 15 (7.55) had more than 25 months experience. Distribution of working hours per day shows, 115 (57.5%) worked more than 8 hours per day and 85 (42.5%) worked for less than or equal to 8 hours per day.

Data on musculoskeletal pain in the last 12 months showed, prevalence was high for lower back 60 (30%) followed by 18 (9%) for neck,17 (8.5%) for shoulder (2% bilateral, 1% left side and 4.5% right side), 11 (5.55) for upper back and less than 5% prevalence was seen in elbow (2.5% right side), wrist/hand (1% bilateral, 0.5%

left side and 2.5% right side), hips/thighs/buttocks, knees and ankle/feet.

The seven days prevalence showed 43 (21.5%) for lower back followed by 11 (5.5%) for neck and rest all the body parts included had prevalence less than 5% (1.5% right side shoulder, 0.5% each for bilateral, right, left was seen in wrist/hand). Prevention to do the work due to the pain in last 12 months showed highest percentage of the respondents experienced it due to lower back pain.

The prevalence rate of musculoskeletal pain was 43% in the last 12 months, 30% in last 7 days and 13% respondent experienced prevention of activities in last 12 months.

Similar study carried out to evaluate the prevalence of musculoskeletal disorders in a group of office workers and also to determine the ergonomics risk factors affecting these disorders.[14] The prevalence of symptoms of musculoskeletal disorders (MSDs) in the past 12 months was reported 60.4 percent. What is more, significant associations were observed between job tenure and hours a day using computer with MSDs (P-value<0.05). In this sense, with one unit increase in job tenure (years) and duration of computer use (hours per day), the probability of incidence of MSDs gone up 17.2% and 15.8%, respectively. Based on the statistical chi-square test, a significant relationship was reported between the incidence of MSDs and Rapid Office Strain Assessment method (P-value<0.05).

Based on the result of the current study it is concluded that there is a significant prevalence of musculoskeletal disorders in all the three categories i.e. pain in last 12 months, last 7 days and prevention from activities in delivery personnel due to repetitive stress on the musculoskeletal system. The prevalence rate of musculoskeletal pain was 43% in the last 12 months, 30% in last 7 days and 13% respondent experienced prevention of activities in last 12 months. These MSDs are most likely caused by long working hours, general body posture, improper handling techniques, mental stress and frequent accidents in hurry to deliver order on time.

Limitations of the study

Severity of the pain couldn't be specified in the current study. Samples with longer work experience were not available.

CONCLUSION

The conclusion of the survey was based on the responses, received through the Nordic Questionnaire form filled by the delivery personnel at various delivery hubs situated in and around Bangalore. Based on the result of the current study the musculoskeletal pain in the last 12 months showed the prevalence was higher for lower back 60 (30%) followed by 18 (9%) for neck. Prevention to do the work due to the pain in last 12 months showed highest percentage of the respondents experienced it due to lower back pain. The statistics further showed majority of people who had musculoskeletal pain from last 12 months were working for more than 8 hours per day (52.3%). The prevalence rate of musculoskeletal pain was 43% in the last 12 months, 30% in last 7 days and 13% respondent experienced prevention of activities in last 12 months. Hence, we can conclude that the MSDs are prevalent in all the three categories i.e. pain in last 12 months, last 7 days and prevention from activities. This prevalence shows that MSDs can affect the delivery personnel even in younger age which can be prevented by cutting down the working hours and following proper safety measures while working.

This study provides the correlation between the working condition of the delivery personnel and the prevalence of MSDs that can be used as a basis for further advancements in the field. It can also be used as guidance for the betterment of the working conditions of the delivery personnel.

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REFERENCES

1. European Agency for Safety and Health at Work. Safety and health at work European good practice awards: Prevention of work-related MSDs in practice. Bilbao: Spain: OSHA; 2008. Report No.: TE-81-08-190-EN-C.
2. Gardner BT, Dale AM, Van Dillen L, Franzblau A, Evanoff BA. Predictors of upper extremity symptoms and functional impairment among workers employed for 6 months in a new job. Accident Analysis and Prevention. 2008;51:932-40.
3. Bernard BP (Ed.), Department of Health and Human Services, National Institute for Occupational Safety and Health, Cincinnati, OH, 1997.
4. National Research Council, The Institute of Medicine. Musculoskeletal disorders and the

workplace: Low back and upper extremities. National Academy Press, Washington, DC, 2001.
5. Sjøgaard G, Sejersted OM, Winkel J, Smolander J, West-gaard K, Westgaard RH. Exposure assessment and mechanisms of pathogenesis in work-related musculoskeletal disorders: significant aspects in the documentation of risk factors, in: O. Johansen, C. Johansen (Eds.), Work and health: Scientific basis of progress in the working environment; February. 1993:22-25.
6. European Commission, Directorate-General V, Employment, Industrial Relations and Social Affairs, Copenhagen, Denmark; 1993:75-87.
7. Rempel DM, Punnett L. Epidemiology of wrist and hand dis- orders, in: M. Nordin, G.B. Andersson, M.H. Pope (Eds.), Mosby-Year Book, Inc, Philadelphia, PA; 1997:421-430.
8. Gkikas N. Automotive ergonomics: driver-vehicle Interaction. London: CRC Press; 2012.
9. Onawumi AS, Oyawale FA. Ergonomic survey of commercial motor- cyclist in Nigeria. Int J Eng Sci. 2016;5(2):23-8.
10. Zomato is one of India‟s largest food aggregators; it started in 2008 in New Delhi to provide consumers with digital access to thousands of restaurant menus. They have more than 5,000 workers across the world. Before Covid19, Zomato used to get 19 million orders per month.
11. Swiggy is India‟s largest food delivery platform founded in 2014 in Bangalore. It has a delivery network focusing on logistics and locking in key resources. It has more than 218,000 workers across the board. Before Covid19, Swiggy was getting 25 million orders per month. Parwez S, Ranjan R. The platform economy and the precarisation of food delivery work in the COVID-19 pandemic: Evidence from India. Work Organization, Labour & Globalization. 2021;15(1):11-30.
12. Kuorinka I, Jonsson B, Kilbom. Standardized Nordic questionnaires for the analysis of musculoskeletal symptoms. Appl Ergon. 1987;18:233-7.
13. Andersson K, Karlehagen S, Jonsson B. The importance of variations in questionnaire administration. Appl Ergon. 1987;18:229-32.
14. Smith E, Hoy DG, Cross M. The global burden of other musculoskeletal disorders: estimates from the Global Burden of Disease 2010 study. Ann Rheum Dis. 2014;73(8):1462-9.
15. Samaei SI, Tirgar A, Khanjani N, Mostafaee M, Bagheri Hosseinabadi M, Amrollahi M. Assessment of ergonomics risk factors influencing incidence of musculoskeletal disorders among office workers. J Health Saf Work. 2015;5(4):1-12.

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