

Prevalence of Work Related Musculoskeletal Pain among Garage Workers of Bharuch District: A Cross Sectional Survey

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ABSTRACT

Background: Car repair is one of the most risky and tiring occupation. Lack of knowledge of proper posture, manual handling and repetitive task can lead to the pain in different part of the body of workers.

Objectives: The main aim of this study was to identify the 12 months prevalence of work related musculoskeletal pain among all male car garage workers in Bharuch district, Gujarat.

Method: Gujarati version of Nordic Musculoskeletal Questionnaire consisting questions about prevalence of work-related musculoskeletal pain in different body region was distributed among 90 participants. From which 20 participants were excluded and total 70 participants were included in the study.

Result: Descriptive statistical analysis was used. From the result lower back part (39.2%) was highest percentage to be affected among car garage workers. And there was lack of physical activity among garage workers only 6 (8.6%) workers were doing physical activity.

Conclusion: The research concluded that nearly 80% of car garage workers experienced work-related musculoskeletal pain, with the highest prevalence found in the lower back. The shoulder was identified as the second most commonly affected area, followed by the neck. Furthermore, a significant number of workers reported experiencing pain in multiple body parts.

Keywords: Car garage workers, work related musculoskeletal pain, Nordic Musculoskeletal Questionnaire.

INTRODUCTION

Professionals in the auto industry understand what it takes to keep a car looking new. Most people place little value on this profession. They are unaware of the health risks and hazards associated with performing simple to complex tasks. Many workers in this field are exposed to health and environmental hazards on a daily basis.(1)Musculoskeletal symptoms are very common condition worldwide. It affects people's activity performance in their everyday life.(2)

Musculoskeletal pain is injuries or pain that occur in the musculoskeletal system of the body. Bones, nerves, tendons, ligaments, joints, cartilage, blood vessels, and spinal discs are examples. Work-related musculoskeletal pain are musculoskeletal pain that are primarily caused or exacerbated by work and the effects of the immediate environment in which work is performed.(3) In repetitive work, discomfort and pain in the neck, shoulders, and upper extremities are more common. Pain associated with mechanical tissue overload caused by repetitive movements, force

requirements, and awkward postures.(4) One of the major factors that can cause or exacerbate WMSDs is the workplace environment.(5)

This sort of musculoskeletal pain affects various body areas, including the back, upper and lower limbs. Activities that involve these body parts are more likely to trigger musculoskeletal pain.(6) Ergonomic risk factor detection in the workplace is an important step in addressing hazards and increasing worker safety. When compared to other forms of workplace injuries, workers suffering from ergonomic-related injuries required greater time off the job.(7)

Car garage workers typically work standing on a cement or similar hard material floor. People who stand for long periods of time at work are more likely than others to experience pain and aching in their legs and low back.(8) Kant et al.(9) discovered that many garage workers are done beneath the hood and below the car in a study of car technicians' working postures. This job demands mechanics to work for extended periods of time with their back bent forward and/or their arms flexed at or above shoulder level. These working positions are stressful on the back and shoulders.(8)

The international labor organization (ILO) evaluate that a few 2 million ladies and men around the world drop casualty to work-related disease each year. Within the developing world, among other things, insufficiency in the workers' understanding of word related risks, and poorly planned workstations are likely to incredibly increase the burden of musculoskeletal pain among laborers.(3) Work related musculoskeletal pain is one of the leading causes of activity-limiting pain among working populations. Individual, psychological, ergonomic, and workplace variables in particular have been found to be aggravating factors in the progression of musculoskeletal illnesses.(3)

The vehicle industry may be an expansive and developing industry in India and this industry utilizes numerous laborers as garage workers. Many health issues affect

garage workers, but musculoskeletal pain is one of the most prevalent.(9)

Garage workers face significant physical risks because they work in awkward postures for long periods of time while standing, sitting, or lying. They typically perform engine tune-ups, oil changes, tire rotation and changes, wheel balancing, repairing mechanical and electrical system malfunctions; raising the vehicle with a hydraulic jack; replacing parts and components; repairing the car's damaged body; and maintaining the vehicle's appearance by cleaning, washing, and painting.(2)

It can be found from the previous study of visual observations of the mechanical work posture when installing the wheel, wheel nuts and during locking nuts that the garage workers was unable to complete the task in a safe and comfortable manner. Additionally, there are no chair or safety shoes used during the work. This is apparent from the tools used and the mechanical work posture.(10)

Scientists and researchers from various nations have created a variety of working posture assessment methods based on each body movement to investigate musculoskeletal pain and develop a safe, comfortable, and healthy work system. These methods were developed in response to research and complaints about musculoskeletal pain.(10)



Figure 1: Overhead posture while repairing

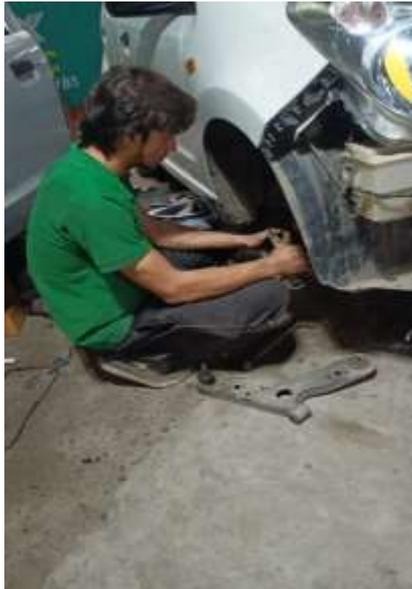


Figure 2: A vehicle repair worker working in poor posture

MATERIALS & METHODS

This research study employed a cross-sectional survey design and was conducted in Bharuch District, Gujarat, India. The sampling method utilized was convenient sampling, resulting in a sample size of 70 participants. The inclusion criteria for the study were as follows: participants had to be between 20 and 50 years of age, have a minimum of one year of continuous involvement in garage work, work for more than 4-6 hours per day, and be exclusively car garage workers. On the other hand, the exclusion criteria were individuals with any previous or recent injury or trauma (such as fractures) and those with diagnosed diseases like cervical and lumbar spondylosis, sciatica, among others.

PROCEDURE

This research article focuses on a study conducted among male garage workers aged between 20 and 50 years old in Bharuch District, Gujarat, India, who experienced work-related musculoskeletal pain. Prior to data collection, participants were informed about the study's objectives and procedures. Informed consent was obtained from all participants before proceeding with data collection. The questionnaire, including its various components, was explained to the garage workers, followed by the

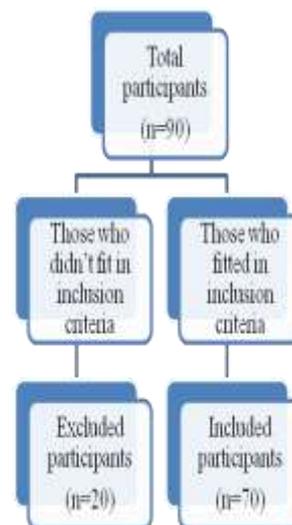
administration of the Gujarati version of the Nordic questionnaire. The collected data were analyzed using the latest version of SPSS, employing descriptive methods.

OUTCOME MEASURE:

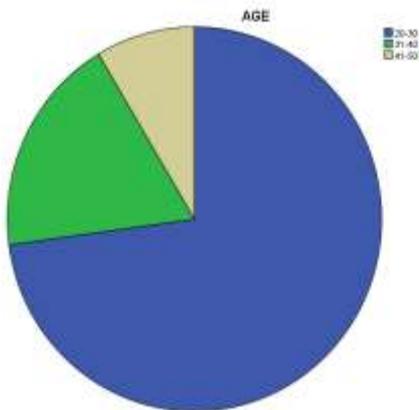
Gujarati version of Nordic questionnaire was used. Face validity and Content validity was found to be good by the expert committee for Gujarati version of Nordic questionnaire and its acceptable reliability value was 0.790.(19)

RESULT

For this research The Nordic questionnaire was distributed to detect pain, and it used YES/NO questions about body parts and a time period of 12 months. In this total 90 participants were there from which based on inclusion and exclusion criteria 20 participants were excluded and total 70 participants were included for the research. All the participants in this study were male. And all of them had work related musculoskeletal pain.

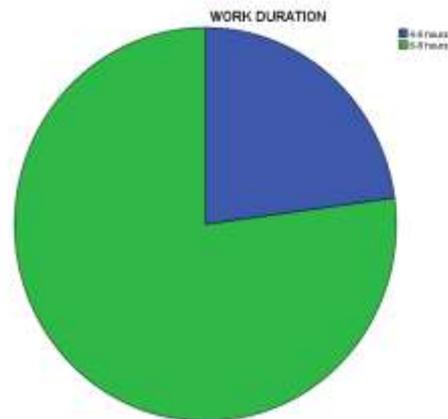


		Frequency	Percent
Years	20-30	51	72.9
	31-40	13	18.6
	41-50	6	8.6
	Total	70	100.0



Graph 1

This graph shows that highest percentage of age in this study was 20 to 30 years. (table 1 and graph 1)

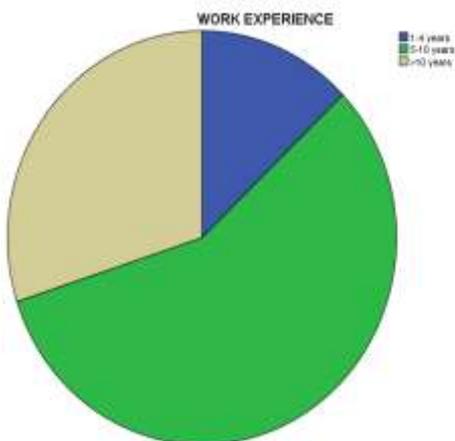


Graph 3

In this study highest percentage of work duration of workers in garage was 6 to 8 hours. (Table 3 and graph 3)

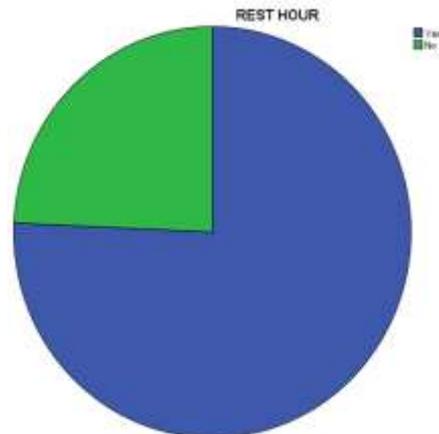
		Frequency	Percent
Years	1-4 years	9	12.9
	5-10 years	40	57.1
	>10 years	21	30.0
	Total	70	100.0

		Frequency	Percent
Taking	Yes	53	75.7
	No	17	24.3
	Total	70	100.0



Graph 2

In these study workers with experience between 5-10 years is the greatest number of years of experience in percentage was seen (57.1%). (Table 2 and graph 2)

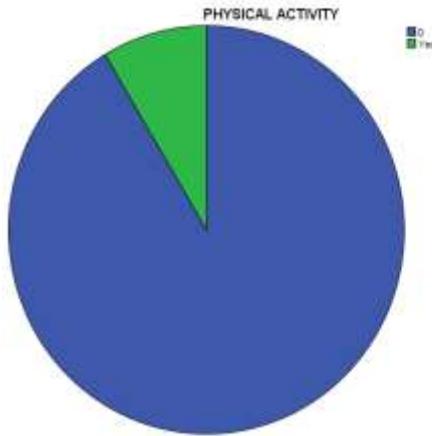


Graph 4

In this survey 53 workers with highest percentage of 75.7% take rest. (table 4 and graph 4)

		Frequency	Percent
Hours	4-6 hours	16	22.9
	6-8 hours	54	77.1
	Total	70	100.0

		Frequency	Percent
Valid	No	64	91.4
	Yes	6	8.6
	Total	70	100.0



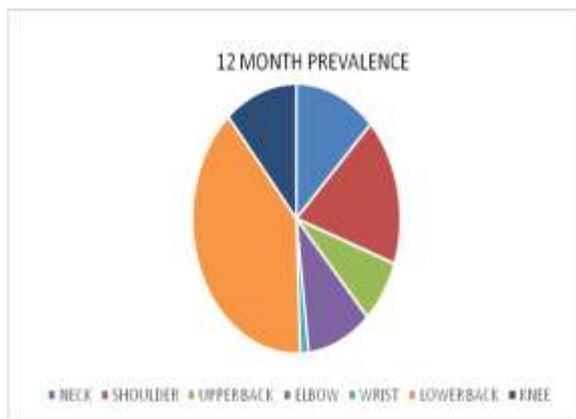
Graph 5

In the survey of 70 workers highest percent of physical activity was 64 with 91.4%. (Table 5 and graph 5)

Table 6: 12 Month prevalence frequencies

		Responses	
		N	Percent
12 Month prevalence	Neck	10	12.7%
	Shoulder	14	17.7%
	Upper back	6	7.6%
	Elbow	8	10.1%
	Wrist	1	1.3%
	Lower back	31	39.2%
	Knee	9	11.4%
Total		79	100.0%

a. Dichotomy group tabulated at value 1.



Graph 6

In this study most common affected body part with work related musculoskeletal pain was lower back with 39.2%. and second most was shoulder. (Table 6 and graph 6)

DISCUSSION

We found the frequency of work-related musculoskeletal pain among car garage workers of Bharuch district. And almost 80% of the workers have work related experience musculoskeletal pain. Total of 70 garage workers were distributed, and data was collected through asking questions and scale grading through Nordic musculoskeletal questionnaire Gujarati version. According to the findings of this study garage workers reported pain in neck is 12.7%(n=10), shoulder is 17.7%(n=14), upper limb is 7.6%(n=6), elbow is 10.1%(n=8), wrist is 1.3%(n=1), lower back is 39.2%(n=31) and knee is 11.4%(n=9) which shows that garage workers suffered the most from lower back pain that is 39.2% after lower back part shoulder is most common area to be affected. Activities that cause pain in garage workers are lifting heavy load, manual handling, bending posture, beneath the car. Other demographic data (age, work experience, work hours, rest do or not, any joint pain, any medicine for pain, and any physical activity) were also collected from the workers. In this study response rate is 80% which is lower than previous study.

According to previous study Sameed Liaquat et al. in 2021 in Lahore WRLBP and Disability among automobile mechanics which was 69.4% in Lahore city. Muscle weakness can be accounted as a major cause of functional 25 disability and low back pain as the end result. This study also shows that frequency of low back pain was high among garage workers which has similar result to our study.(17) Another study was done in southern Ethiopia Aiggan Tamene et al. in 2020 which also shows that Lower back pain was the most commonly reported pain or discomfort in this study, accounting for 62.8% of all reports.(22)which has similar result to our study.

According to Alka Chandraknata et al. in 2022, 61.33 percent of garage workers reported neck pain in the last year in

Uttarakhand. Where as in our study it was 12.7% second most common area to be affected in our study. Back, neck and shoulder problems were more associated with poor working postures, while limbs, hand, and wrist problems were more affected by repetitive movements.(23) Physical fitness is defined as the ability to perform daily tasks with vigor and alertness without excessive fatigue, as well as to have enough energy to enjoy leisure activities and respond to unforeseen emergencies. Good physical fitness results in to higher productivity at work and vice versa.(22) In this study we can see that physical activity like daily exercise are less likely to be performed among workers that can also lead to the work related musculoskeletal pain due to inadequate muscle power. That can increase by advising them some daily physical activities. And can also advise proper posture or positioning that will reduce work related musculoskeletal pain.

Krishnendu Sarkar et al. in 2016 found that male workers carrying about 100 kg overhead for a distance of about 800 meters. And severity of low back pain was higher than other body part by using BPD scale due to repeated jerk movement of trunk and leg in addition to twisting and bending. That is similar to our result. They also mention that in a review of MSD research, the National Institute of Occupational Safety and Health (NIOSH) discovered strong evidence that low back disorders are related to forceful lifting and the weight of the load lifted.(14)

CONCLUSION

This study evaluates the prevalence of work-related musculoskeletal pain in past 12 month among car garage workers which concluded that most of the garage workers were suffered from lower back pain due to heavy work load. Secondary to the lower back, shoulder is most common part to be affected. And many workers had pain in more than one region. It is recommended to reducing the frequency of back movement during manual handling tasks, waist/hand

deviation or bending and neck bending or twisting.

Declaration by Authors

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