



## THE PREVALENCE OF WORK RELATED MUSCULO SKELETAL DISORDERS AMONG CAR DRIVERS IN SRM UNIVERSITY

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### **Abstract**

*Work-related musculoskeletal disorders (WRMD) and other postural damage may result in physiological illness that may develop over a long period due to prolonged mechanical stresses imposed on the musculoskeletal system. Driving most often refers to the controlled operations and movement of a motorized vehicle, Such as car, truck or a bus. Driving in traffic is more than just knowing how to apply the rules of the road. An effective driver also has an intuitive understanding of the basics of the vehicle handling and can drive responsibly, whereas, improper handling leads to various musculoskeletal disorders.*

### **Objectives**

To investigate the most common musculoskeletal disorders experienced by the car drivers in SRM UNIVERSITY, Kattankulathur campus. Study Design: study design: Non-Experimental Study Type: Observational. Sampling Method: Convenient sampling Sample Size: 108 samples. Study setting: SRM University, Kattankulathur.

### **Methods**

Subjects who have met the inclusion criteria and exclusion criteria were assessed for normal complaints using physiotherapy assessment format. Personal information about respondent like name, sex, nationality, town, city, age and educational background were requested. driving license, years of experience and model of the vehicle were also included. The consent form should be explained to the subjects and acceptance was obtained. Subjects are explained with Nordic Questionnaire and its importance. True markings and response are encouraged from the subjects. Obtained response is documented for statistical analysis.

**Key words:** *car drivers, Work related Musculoskeletal Disorders, Nordic Questionnaire.*

### **Introduction**

Musculoskeletal disorders include damage to tendons, tendon sheaths, and synovial lubrication of tendon sheaths, related to bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck and back. Generally, the car drivers report of neck, shoulders, back, lumbar, elbows, wrist, hands, buttock, knee and ankle pain by which their range of motion is restricted or limited. Driving most often refers to the controlled operations and movement of a motorized vehicle, Such as car, truck or a bus. Driving in traffic is more than just knowing how to apply the rules of the road. An effective driver also has an intuitive understanding of the basics of the vehicle handling and can drive responsibly, whereas, improper handling leads to various musculoskeletal disorders. Such data can only be obtained by involving the drivers involved in driving frequently. The design of driving pattern among car drivers needs an input for consideration, the human-body dimensions as well as other physical and psychological limitations during



driving. Professional drivers have a higher prevalence of occupational disorders than other groups. Since their occupation involves postural stress, specifically twisting, bending which increase risk of diseases of lower back besides exposure to vehicle vibrations particularly when working in confined areas. Work-related musculoskeletal disorders (WRMD) and other postural damage may result in physiological illness that may develop over a long period due to prolonged mechanical stresses imposed on the musculoskeletal system. Poor design of driver's workplace and poor sitting posture are part of what are responsible for stresses and strains imposed by the uncontrollable conditions of the elements of workplace on drivers. Musculoskeletal pain comprises a major health problem for the general population, affecting their quality of life, demanding increased health care and organization. The most frequently reported risk factor for pain is heavy physical workload such as lifting, awkward posture, and whole body vibration. Interestingly, the risks have been noted to be higher for similar exposure i.e. driving for more than half the working day, more than 2 hours a day and more than 10 hours a week. There are many reasons why a high prevalence of musculoskeletal pain could be expected, for example, prolonged sitting, fixed posture, vibration, asymmetric forces acting on the body and perhaps periodic lifting, any of which individually could lead to musculoskeletal troubles. Variables such as gender, lifestyle, work tasks, mood and motivation may also have an effect on reports of symptoms of discomfort. The operation of foot controls like brakes and accelerator with accommodation of passengers in the front cabin changes the alignment of the lower extremities.

**Aim of Study:** To investigate the most common musculoskeletal disorders experienced by the car drivers in SRM UNIVERSITY, Kattankulathur campus.

### **Need for the Study**

Car drivers who drive long distance daily experience more Musculoskeletal Disorders worldwide. Creating awareness among those drivers for Common work related disorders are the need of the hour than treating their conditions. Further, when most common musculoskeletal disorders among car drivers is known ergonomic advices and preventive measures can be framed and educated for the improvement of quality of life of car drivers. Hence, this study is done.

### **Methodology**

#### **Study Design**

Non-Experimental Study Type: Observational Sampling Method: Convenient Sampling Sample Size: 108 Samples Study Duration: 1 Days Study Setting: Srm University, Kattankulathur.

**Inclusion Criteria** :Person who drives the car to SRM University Kattankulathur campus, Age limit: 25-50 years Experience: >5 years in driving, Male drivers driving more than an hour per day and more than 10 hours per week.

#### **Exclusion Criteria**

Subjects, who have undergone recent surgeries (musculoskeletal), recent trauma to be excluded from assessment, vascular diseases and Neurological disorders.

### **Procedure**

Subjects who have met the inclusion criteria and exclusion criteria were assessed for normal complaints using physiotherapy assessment format. Personal information about respondent like name, sex, nationality, town, city, age and educational background were requested. Also included driving license, years of experience and model of the vehicle. The consent form should be explained to the subjects and acceptance was obtained. Subjects are explained with Nordic Questionnaire and its importance. True



markings and response are encouraged from the subjects. Obtained response is documented for statistical analysis. A Nordic questionnaire is explained in detail and is requested to fill by themselves. The questionnaire consists of three questions for evaluating trouble with the locomotive organs. The whole body is divided into nine regions. They are neck, shoulder, elbow, wrist/hand, upper back, lower back, thighs/hip, knee and ankle/foot.

**The Questionnaire can be filled by the following criteria,**

1. Have you at any time during last 12 month had trouble (ache, pain, discomfort, numbness) in?.
2. Have you at any times during the last 12 months been prevented from doing your work (at home or away from home) because of the trouble?.
3. Have you had trouble at any time during the last 7 days?.

Respective Ergonomic Education is given to the subjects depending upon their Work Related Musculoskeletal Disorders. Protective and Preventive Exercises are given to reduce further risks. Home care and advices taught to them.

According to the posture of the driver and duration of the work per day relates with musculoskeletal problems are also raised.

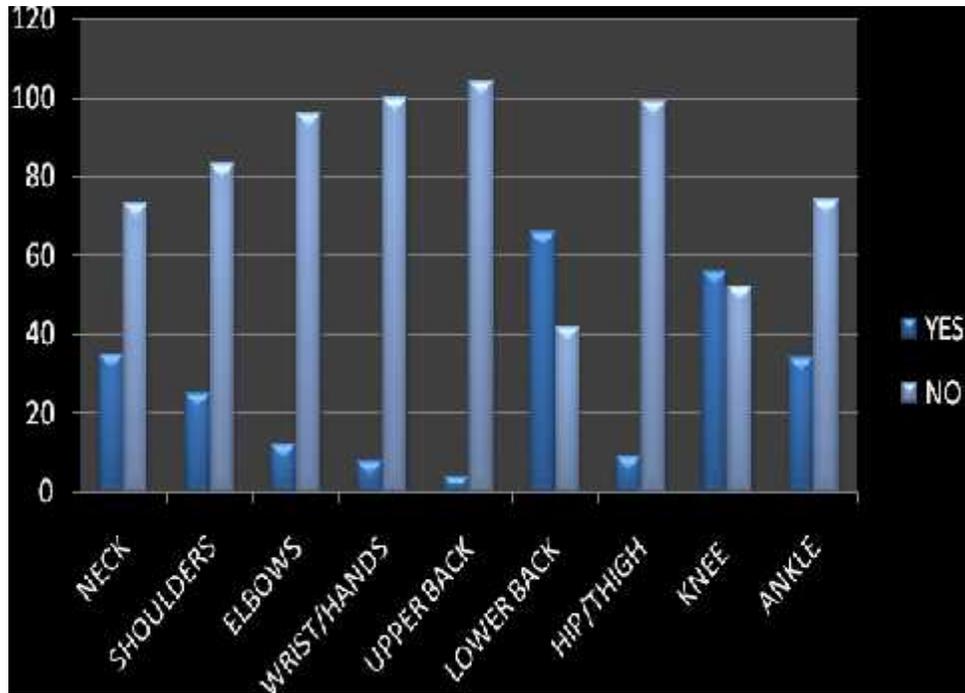
**Data Analysis**

**Table 1: percentage of Pain In Different Regions of The Body At Any Time During Last 12 Months Among Car Drivers**

<b>Regions of Pain</b>	<b>YES</b>	<b>NO</b>
Neck	35	73
Shoulders	25	83
Elbows	12	96
Wrist/Hands	8	100
Upper Back	4	104
Lower Back	66	42
Hip/Thigh	9	99
Knee	56	52
Ankle	34	74



**Graph 1: Percentage of Pain In Different Regions of The Body At Any Time During Last 12 Months Among Car Drivers.**

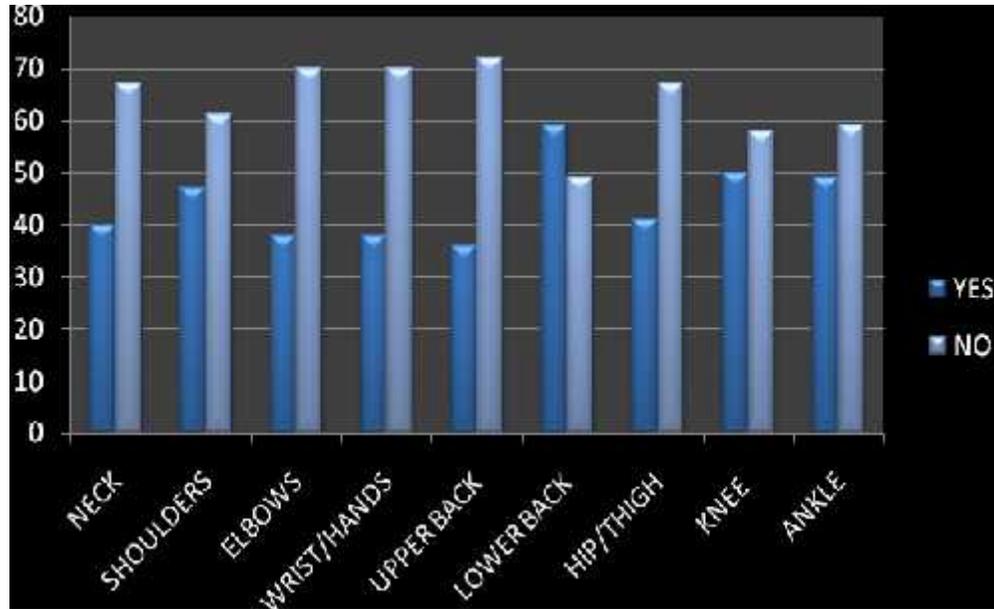


**Table 2: Percentage of Pain That Has Prevented From Doing Work during Last 12 Months among Car Drivers.**

Regions of Pain	Yes	No
Neck	40	67
Shoulders	47	61
Elbows	38	70
Wrist/Hands	38	70
Upper Back	36	72
Lower Back	59	49
Hip/Thigh	41	67
Knee	50	58
Ankle	49	59



**Graph 2: Percentage of Pain That Has Prevented From Doing Work during Last 12 Months among Car Drivers.**

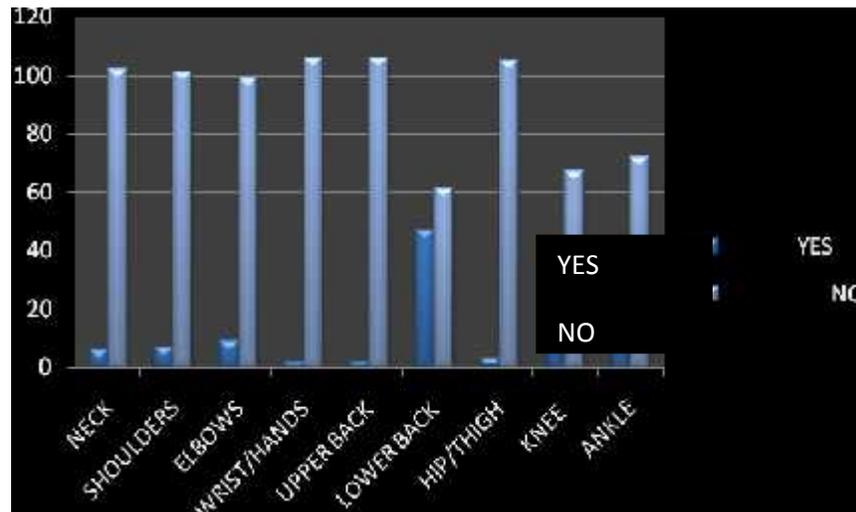


**Table 3: Percentage of Pain at Any Time during the Last 7 Days among Car Drivers.**

Regions of Pain	Yes	No
Neck	6	102
Shoulders	7	101
Elbows	9	99
Wrist/Hands	2	106
Upper Back	2	106
Lower Back	47	61
Hip/Thigh	3	105
Knee	41	67
Ankle	36	72



**Graph 3: Percentage of Pain at Any Time during the Last 7 Days among Car Driver**



**Results: Table 1**

The musculoskeletal disorders in car drivers within 12 months with a cause of pain, ache, discomfort, numbness while working or on the rest period were assessed. The statistical analysis shows about 35% of the car drivers reported neck pain, 25% of car drivers reported shoulder pain, 12% of car drivers reported elbow pain, wrist/hands pain was reported in about 8% of car drivers, upper back pain was found in about 4% of car drivers, about 66% of car drivers were found with Low back pain and it was found to be the most higher discomfort found among car drivers, 9% of car drivers were found with hip /thigh pain, knee pain was found among 56% of car drivers, ankle pain was found in about 34% of car drivers as marked from the subjects using the NORDIC Questionnaire.

**Table 2**

The musculoskeletal disorders in car drivers had prevented from doing work during last 12 months with a cause of pain, ache, discomfort and numbness while working or on the rest period were assessed. The statistical analysis shows about 40% of the car drivers reported neck pain, 47% of car drivers reported shoulder pain, 38% of car drivers reported elbow pain, wrist/hands pain was reported in about 38% of car drivers, upper back pain was found in about 36% of car drivers, about 59% of car drivers were found with Low back pain and it was found to be the most higher discomfort found among car drivers, 41% of car drivers were found with hip /thigh pain, knee pain was found among 50% of car drivers, ankle pain was found in about 49% of car drivers as marked from the subjects using the NORDIC Questionnaire.

**Table 3**

The musculoskeletal disorders in car drivers at any time during the last 7 days while working or on the rest period were assessed. The statistical analysis shows about 6% of the car drivers reported neck pain, 7% of car drivers reported shoulder pain, 9% of car drivers reported elbow pain, wrist/hands pain was reported in about 2% of car drivers, upper back pain was found in about 2% of car drivers, about 47% of car drivers were found with Low back pain and it was found to be the most higher discomfort found among car drivers, 3% of car drivers were found with hip /thigh pain, knee pain was found among 41% of car drivers, ankle pain was found in about 36% of car drivers as marked from the subjects using the NORDIC Questionnaire.



## Discussion

Musculoskeletal pain comprises a major health problem for the general population, affecting their quality of life, demanding increased health care and organization. There are many reasons why a high prevalence of musculoskeletal pain could be expected among car drivers, for example prolonged sitting, fixed posture, vibration, asymmetric forces acting on the body and perhaps periodic lifting, any of which individually could lead to musculoskeletal troubles. About 66% of car drivers gave a history of low back pain during past 12 months which was the highly reported discomfort, Knee pain was the second most reported discomfort about 56% among car drivers. It due to the poor ergonomic posture inside the car and this results a predominant low back pain. About 59% of car drivers gave a history of low back pain that has prevented them over last 12 months from doing any work in home or away from home, Knee pain was the second most reported discomfort about 50% among car drivers. It is because of the bad posture during driving and position of the seat, vibration and road-shock. These may be a cause of low back pain. About 47% of car drivers gave a history of low back pain in last 7 days, which was most reported discomfort, Knee pain was the second most reported discomfort with about 41% among car drivers. The most frequently reported risk factor for pain is heavy physical workload such as lifting, awkward posture, and whole body vibration. Interestingly, the risks have been noted to be higher for similar exposures i.e. driving for more than half the working day, more than 2 hours a day and more than 10 hours a week. The results can be further explained by Rahul Shaik et al (2014) concluded that Increasing age, work experience, maximum working hours per week, increased left shoulder to handle distance and greater driver's seat vibrations are increasing the risk of musculoskeletal disorders. Most of the drivers do not adopt an correct posture while driving and driving for prolonged hours make the shoulder muscles and low back muscles tired and with time lead to inappropriate firing and due to improper posture certain muscle goes for lengthened position and few muscle goes for shortened state which may lead to discomforts. This view can be supported by Okunribido et al (2008) showed that interaction effects due to posture and one or both of vibration and manual materials handling, rather than the individual exposure effects, are the main contributors for precipitation of LBP. Work-related musculoskeletal disorders (WRMD) and other postural damage may result in physiological illness that may develop over a long period due to prolonged mechanical stresses imposed on the musculoskeletal system and this may lead to poor work performance and frequent leave. Car drivers should have more concentration and less tension to excel in their job and to prevent unnecessary accidents. These discomforts as mentioned above may disturb the concentration and also the pain affects the mental status indirectly thus compromising the concentration while driving. As GH Walker et al (2006) stated that the role of ergonomics can also play a vital role in contemporary vehicle design. Ergonomics should be educated and followed to prevent the discomfort and make car drivers to work efficiently without pain.

## Conclusion

From the above study it is concluded that prevalence of musculoskeletal disorders is high among car drivers and low back pain being the highest reported in past 12 months (66%) and also it was the first that prevented them from work (59%) and also the worst discomfort in past one week (47%). Hence, insisting and providing ergonomic advice to Car drivers will be helpful from preventing musculoskeletal disorders in future.

## Limitations

Car drivers were selected only from SRM University Kattankulathur campus. Small sample size was taken.



## Recommendations

The follow-up of car drivers who were taught the ergonomic advices and exercises could be done. Further studies can be done effect of ergonomic advices on musculoskeletal discomfort. Studies can compare the discomforts between the different types of car users. Can be done on truck drivers.

## Conclusion

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