



## Research Article

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# Overview of musculoskeletal pain complains in motorcycles and car drivers

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## Abstract

**Background:** Motorcycle and car riders in Indonesia have a very high population. This results in the rider's body being in a prolonged static position every day while driving. Motorcycle and car riders are forced to drive a vehicle for at least 1 – 2 hours a day. Prolonged sitting positions can result in some musculoskeletal pain. This study aims to analyze the use of vehicles, both motorcycles and cars, in terms of driving duration and determine the incidence of musculoskeletal pain. **Methods:** This research uses a descriptive research design with a cross-sectional analysis. The data source for this research is primary data obtained by interviewing and using a questionnaire that refers to the Nordic Body Map to map musculoskeletal pain complaints felt by participants while driving. **Results:** The total population was 124 people, however, only 88 samples were willing to be research subjects in this study. The results shown that more than 60 percent of respondents felt musculoskeletal pain in their bodies because of driving. Driving for more than 3 hours a day is one of the factor causing the musculoskeletal pain. From the data that has been obtained, it can be seen that musculoskeletal pain is felt in almost all parts of the body. Furthermore, pain in the lower back and neck was the most painful area of the body that felt by the most respondents. The upper back/shoulder is also a part of the body that feels pain almost the same as the neck. **Conclusion:** Vehicle drivers, both motorcycles and cars, have quite a large percentage of experiencing musculoskeletal pain complaints. The parts of the body that experience the most of musculoskeletal pain complaints are the low back, neck and upper back or shoulders.

**Keywords:** Motorcycles, Car, Driving, Musculoskeletal Pain, Physiotherapy.

## INTRODUCTION

Motorcycle riders in Indonesia have a very high population, coupled with the existence of several online transportation applications that require riders to ride motorcycles for quite a long time <sup>[1]</sup>. The population of motorcycle riders and car drivers is equally large, especially in big cities like Jakarta <sup>[2,3]</sup>. With a dense human population and high mobility, significant traffic jams occur during daily driving by car or motorcycle <sup>[3]</sup>. With the condition of the human population being quite large, motorcycle and car riders are forced to drive the vehicle for at least 1 – 2 hours a day due to traffic dense <sup>[4]</sup>. This results in the rider's body being in a prolonged static position in a day while riding. Prolonged sitting positions can result in several musculoskeletal pain complaints <sup>[5]</sup>. Musculoskeletal pain complaints are generally felt in various joints in the body in the form of pain, movement disorders and even radicular pain <sup>[6]</sup>. Physically, the bodily discomfort can result in body fatigue when carrying out activities or work after driving <sup>[7]</sup>. Furthermore, joint discomfort can cause other health problems and affect a person's psychological condition at work <sup>[8]</sup>. Consequently, it can also cause decreased productivity due to complaints of discomfort in the joints <sup>[9]</sup>. These complaints can increase absenteeism from work because people who drive a vehicle with musculoskeletal complaints have to go to healthcare services to receive treatments like physiotherapy or medication <sup>[10]</sup>. This study aims to analyze the use of vehicles, both motorcycles and cars, in terms of driving duration and determine the incidence of musculoskeletal pain. This research can provide a sufficient knowledge base to develop further applied research on musculoskeletal complaints in motor vehicle drivers.

## METHOD

This research uses a descriptive research design with cross-sectional analysis. The sample in this study was all participants in the vehicle gas emissions test conducted by the Universitas Kristen Indonesia, Jakarta on November 26, 2019. The data source used is the primary data obtained through interviews and using a questionnaire that refers to the Nordic Body Map to map complaints of musculoskeletal pain felt by participants while driving. However, the questionnaire is simplified by only mapping the areas where

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musculoskeletal complaints occur. The total population was 124 people, but only 88 samples were willing to be research subjects in this study. All subjects who took part in the study met the inclusion criteria, namely, vehicle gas emissions test participants at the Universitas Kristen Indonesia and were willing to become respondents. The exclusion criteria for this study were motor vehicle drivers who had muscle and/or bone disorders before the research was conducted, had experienced a serious accident, and were unwilling to be respondents.

The questionnaire is divided into two parts. The first stage is collecting identity data such as name, age, gender, vehicle most frequently used, length of time spent driving, and then questions regarding complaints of pain after driving. From the last question of the first stage, respondents will be selected regarding complaints of musculoskeletal pain and continue to the second stage.

Thereafter, in the second stage of the questionnaire, it only applies to respondents who complain of musculoskeletal pain. The question is more specific to the part of the body that feels pain after driving a vehicle for a long time. There are seven body parts that respondents can choose from, namely neck, shoulder blades, elbows, wrists, lower back, knees and ankles.

The data that has been obtained is then processed and analyzed with the Statistical Package for The Social Science (SPSS) version 26. The results obtained with the questionnaire were processed and presented in the form of a frequency distribution table and then analyzed descriptively to determine the overview of musculoskeletal complaints in motor vehicle drivers.

## RESULTS AND DISCUSSION

From the total 124 target participants, only 88 respondents were willing to take part in this research and fill out the questionnaire prepared by the researcher. The following table is the profile of the respondents based on the first stage of the questionnaire.

**Table 1:** Respondents Profile

Parameter	N (%)
Total Respondents	88 (100)
Respondents profile	
Age	
17- 20 years old	30 (34.1)
21 – 30 years old	22 (25)
31- 40 years old	6 (6.8)
41-50 years old	15 (17)
51 – 60 years old	7 (8)
<60 years old	8 (9.1)
Gender	
Male	68 (77.3)
Female	20 (22.7)
Type of vehicle	
Motorcycle	60 (68.2)
Car	28 (31.8)
Driving duration in 1 day	
Around 30 minutes	14 (15.9)
Around 1 hour	15 (17)
Around 2 hours	21 (23.9)
Around or more than 3 hours	38 (43.2)

From the data that was collected, respondents who took part in this research were classified into teenagers starting from the minimum age allowed to drive a vehicle, namely 17 years to 20 years. Then the next age classification is based on productive working age based on previous research, namely within a range of 10 years [11]. With this classification, it can be seen that the early ages are dominated by teenagers who use motorcycles, followed by those aged 21-30 years who are students and productive workers. Following classification is the age of 41-50 years which is also the final stage of productive age. This result is also supported by several previous studies which stated that ages 17 to 21 years are one of the age ranges that often use a vehicle [1,12]. Nevertheless, those several previous studies stated that those aged 22-35 years were the most frequent users. This can be determined that they use vehicles for daily work more often than those aged 17- to 20 years old.

Then, from the classification of respondents based on gender, there were results that the majority of men used motor vehicles with more than 60 percent of the respondents. In previous research, it was also stated that most men use cars or motorcycles [13]. Furthermore, in the vehicle category, motorcycles are the vehicle most used by respondents. The data shows that more than half of the respondents use motorcycles. This condition often occurs in urban areas where more of the population uses motorcycles because motorcycles are more suitable for traffic, as a result the population of motorcycles is also very high [2-4].

Driving duration was also analyzed in this study. In the data, most respondents answered around or more than 3 hours of driving. The results of this research are also in line with several previous studies where many people use vehicles for more than three hours due to their work as online transportation drivers, the availability of public transportation and the distance to their destination [4,13,14]. Furthermore, previous research also states that long driving conditions can also result in the risk of stress and musculoskeletal disorders [7,14]. In fact, over a long period of time, it also causes physical fatigue which allows the risk of accidents due to lack of concentration [15].

After all the respondents' profiles were described, it was continued with an analysis of musculoskeletal pain complaints among respondents, then a cross-tabulation analysis between motorcycle and car drivers, gender and driving duration.

**Table 2:** Musculoskeletal pain complaints among respondents

Characteristic		Musculoskeletal pain complaints	
		Yes N (%)	No N (%)
All Respondents		61 (69.3)	27 (30.7)
Type of Vehicle	Motorcycle	42 (70)	18 (30)
	Car	19 (67.9)	9 (32.1)
Gender	Male	46 (67.9)	22 (32.4)
	Female	15 (75)	5 (25)
Driving Duration	Around 30 minutes	7 (50)	7 (50)
	Around 1 hour	10 (66.7)	5 (33.3)
	Around 2 hours	15 (71.4)	6 (28.6)
	Around or more than 3 hours	29 (76.3)	9 (23.7)

The results of the data show that more than 60 percent of respondents felt musculoskeletal pain in their bodies due to driving. From the data analyzed, motorcycle users mostly complained of musculoskeletal pain. Despite this, more than half of car drivers also experience musculoskeletal pain. In terms of gender, both men and women, more than half of the respondents complained of musculoskeletal pain.

Moreover, driving duration is also a factor in the high percentage of musculoskeletal pain complaints. As can be seen from the data, more than 75 percent of respondents who driving vehicles for more than 3 hours a day experience musculoskeletal pain

The condition of musculoskeletal pain is very likely to occur in motor vehicle drivers, whether using motorcycles or cars [13]. Previous research also supports that riding a motorcycle is one of the factors causing musculoskeletal pain [7]. This also includes driving motorcycles and cars for a long time which can increase complaints of musculoskeletal pain [4,7]. Musculoskeletal pain conditions can also be caused by prolonged sitting while driving and causing fatigue and pain in the body [1,6]. The majority of men use vehicles more, thus increasing the number of complaints of musculoskeletal pain in men compared to

women. Previous research has also shown that almost half of the respondents experience complaints of musculoskeletal pain because vehicle drivers are also more dominated by men [13].

The results of the questionnaire in the second stage are to analyze the part of the body that experiences pain. In this section, only 61 respondents answered that they experienced complaints of musculoskeletal pain, hence, the analysis of body parts that felt pain was only for respondents who had complaints. The choices are divided into 7 body parts and respondents can choose more than one. The following are the results of the respondents' choices.

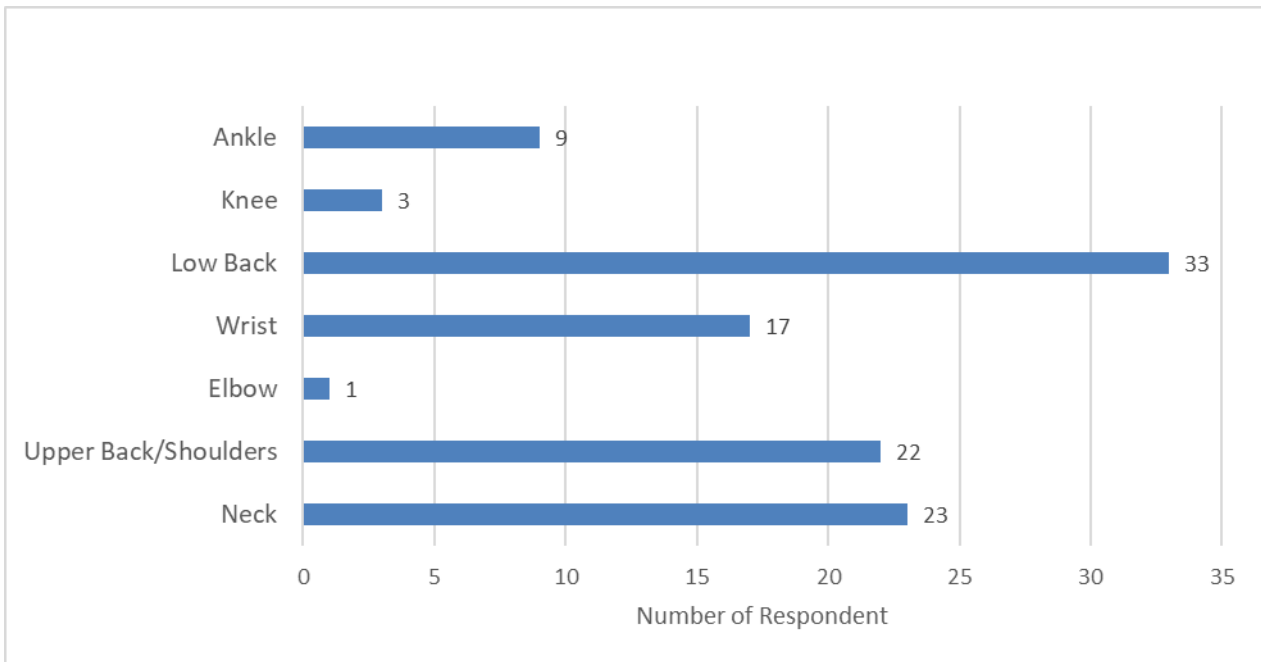


Figure 1: Musculoskeletal Pain Body Parts (n=61)

From the data obtained, it can be seen that musculoskeletal pain is felt in almost all parts of the body. Furthermore, pain in the lower back and neck were the parts of the body that were most frequently felt by respondents. The upper back/shoulder is also a part of the body that feels pain in almost the same amount as the neck. Also, wrist pain was also quite high with 17 respondents. The results of this study are supported with several previous studies. Gibran et al., in their research stated that low back pain was a problem experienced by vehicle users by almost 60 percent of the research respondents [13]. Also in their research, wrist pain was also studied and pain disorders were found in the wrist, although not more than 50 percent of the research respondents.

Previous research by Sylvano & Novendy, also shows that a percentage of people who regularly use motor vehicles more than 60 percent who experience lower back pain for about 1 week using a vehicle [4]. The research also stated that most drivers had to stop working due to lower back pain.

Likewise, research by Pickard et al., who identified musculoskeletal disorders in drivers using a systematic review method stated that low back pain was one of the disorders most frequently complained about by drivers [16]. Apart from that, they also stated that the neck, shoulders, upper back and knees were also parts of the body that felt pain due to their work as drivers. Their research also concluded that the factors causing musculoskeletal pain are prolonged sitting, prolonged use of vehicles due to work, body ergonomics, as well as vibrations or swaying produced by vehicles which cause muscles to

work harder to maintain good posture. Previous research also stated the same thing, low back pain can occur due to prolonged sitting for at least 3 hours a day [5]. This was also concluded from previous research where low back pain often occurs due to lower crossed syndrome in vehicle [17]. Several approaches can be given to reduce musculoskeletal pain, namely by improving ergonomics when driving, stretching exercise programs that can be provided by a physiotherapist [16]. A self-stretching program has become one of the initial treatments when complaints of musculoskeletal pain occur due to static positions [18,19].

The author also realizes several weaknesses in this research. This research is only an observational descriptive study that determines the incidence of musculoskeletal pain complaints felt by respondents who use vehicles in terms of the type of vehicle used, gender, and duration of driving the vehicle and does not identify the relationship between all factors and musculoskeletal complaints. This research more specifically analyzes body parts that experience musculoskeletal pain disorders. Hence, it is hoped that research with better methods will be carried out in the future.

Other factors such as road conditions, traffic density and stress levels were not analyzed in this study. Therefore, further research could analyze the relationship between musculoskeletal complaints and other possible contributing factors. The results of this research are expected to be used appropriately because they cannot represent a population. This is because the number of respondents is small and data is only collected at one time.

## CONCLUSION

From the results and discussion, it can be concluded that motor vehicle drivers, both motorcycles and cars, have a fairly large percentage of experiencing musculoskeletal pain complaints. Some risk factors that may cause musculoskeletal pain disorders are the type of vehicle and the vehicle driving duration which requires prolonged static sitting when driving. The body parts that experience the most musculoskeletal pain complaints are the low back, neck and upper back or shoulders.

## Recommendation

In this study, researchers were assisted by several volunteers, namely physiotherapists, who provided ergonomics education and stretching exercises to all respondents. This is done because ergonomics education and self-stretching are highly recommended to reduce musculoskeletal disorders in vehicle driving activities. Neck and lower back stretches can be done while the rider is resting.

## Conflict of Interest

Author has no conflict of interest to declare.

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## Compliance with Ethics

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## REFERENCES

1. Putra R, Legiran, Azhar M. Hubungan posisi duduk dan ketidaksesuaian desain tempat duduk sepeda motor dengan kejadian nyeri pingang pada pengendara ojek daring. *Maj Kedokt Sriwij.* 2018;(April):74-84.
2. Kresnanto NC. Model Pertumbuhan Sepeda Motor Berdasarkan Produk Domestik Regional Bruto (PRDB) Perkapita (Studi Kasus Pulau Jawa). *Media Komun Tek Sipil.* 2019;25(1):107. doi:10.14710/mkts.v25i1.18585
3. Chie HH, Widaningrum DL. Kajian Perilaku Bersepeda Motor Di Jakarta. *Ind Syst Eng Assess J.* 2014;15(1):42-51.
4. Sylvano L, Novendy. Hubungan Durasi Berkendara Dengan Kejadian Gejala Low Back Pain Pada Pengemudi Ojek Online. *Ebers Papyrus.* 2021;27(2):42-49.
5. Anggiat L, Hon WHC, Baait SN. The incidence of low back pain among university students. *J Pro-Life.* 2018;5(3):677-687.
6. Fahmi R. Gambaran Kelelahan dan Keluhan Muskuloskeletal pada Pengemudi Bus Malam Jarak Jauh PO. Restu Mulya. *Indones J Occup Saf Heal.* 2015;4(2):167-176.
7. Dalope M, Kawatu A., Joseph B. Hubungan Durasi Pengemudi Dan Faktor Ergonomi Dengan Keluhan Nyeri Pinggang Pada Sopir Bus Trayek Manado-Langowan Di Terminal Karombasan. *J Fak Kesehat Masyarakat, Univ Sam Ratulangi.* Published online 2018:1-5.
8. Iqramullah M, Asri A, Fakhri N. Stres Berkendara Akibat Kemacetan Lalu Lintas Dan Perilaku Agresif Berkendara. *Gema Lingkungan Kesehatan.* 2022;20(2):105-110. doi:10.36568/gelinkes.v20i2.28

9. Daneshmandi H, Choobineh AR, Ghaem H, Alhamd M, Fakherpour A. The effect of musculoskeletal problems on fatigue and productivity of office personnel: A cross-sectional study. *J Prev Med Hyg.* 2017;58(3):E252-E258.
10. Svebak S, Halvari H. Sickness absence due to chronic musculoskeletal pain: The exploration of a predictive psychological model including negative moods, subjective health and work efficacy in an adult county population (The HUNT study). *Eur J Psychol.* 2018;14(2):373-385. doi:10.5964/EJOP.V14I2.1470
11. Maulidia M, Fairuzabadi F. Pengaruh Usia Terhadap Keseimbangan Kehidupan Kerja Yang Dimediasi Oleh Batasan Pekerjaan Di Kantor Dan Batasan Pekerjaan Di Rumah Pada Karyawan Sektor Perbankan Di Banda Aceh. *J Ilm Mhs Ekon Manaj.* 2021;6(3):471-485.
12. Lovely, Lady, Rizqandini LA, Trenggonowati DL. Efek usia, pengalaman berkendara, dan tingkat kecelakaan terhadap driver behavior pengendara sepeda motor. *J Teknol.* 2020;12(1):57-64.
13. Gibran K, Dewi WN, Damanik SRH. Identifikasi Masalah Muskuloskeletal Pada Pengendara Transportasi Umum. *J Ners Indones.* 2020;10(2):216. doi:10.31258/jni.10.2.216-228
14. Hidayat J, Istriana E. Hubungan lama mengemudi dan tingkat stres pada supir bus antar kota. *J Biomedika dan Kesehat.* 2019;2(1):34-38. doi:10.18051/jbiomedkes.2019.v2.34-38
15. Marmo S, Indriastingsih E, Oktavia A, Devi T. Mengelola Kelelahan/Fatigue Management Case Kecelakaan Transportasi Dampak Dari Kelelahan Pengendara Kendaraan. *Gaug Inform.* 2016;9(3):140-150.
16. Pickard O, Burton P, Yamada H, Schram B, Canetti EFD, Orr R. Musculoskeletal Disorders Associated with Occupational Driving: A Systematic Review Spanning 2006–2021. *Int J Environ Res Public Health.* 2022;19(11). doi:10.3390/ijerph19116837
17. Hafid ZS, Aisyah N U, Putro PD. Nyeri Punggung Bawah Akibat Posisi Duduk yang Salah Pada Pesepeda. *J Keterampilan Fis.* 2020;5(2):71-88. doi:10.37341/jkf.v5i2.233
18. Anggiat L. A brief review in Non-Specific Low Back Pain: Evaluation and Physiotherapy Intervention. *Int J Med Exerc Sci.* 2020;6(3):760-769. doi:10.36678/ijmaes.2020.v06i03.001
19. Budhyanti W, Anggiat L, Juwita CP. Penanganan dan pencegahan nyeri leher dan punggung bawah dengan peregangan mandiri pada pegawai sekolah menengah kejuruan negeri 10 cawang : program pengabdian kepada masyarakat. *J Fisioter dan Rehabil.* 2020;4(1):79-89.

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