

## “Correlation Between Pain and Disability in Cervical and Lumbar Spine in Two-Wheeler Riders”

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### Abstract

**Background:** India is a nation with crowded streets and limited parking spaces, making two wheelers as a preferred modes of commute in cities. Current design of motorbike in market is not equipped with back leaning postures support features for rider leading to musculoskeletal pain in the riders. Use of helmets causes discomfort in neck region; such pain and discomfort affect the quality of life leading to disability (QoL).

**Objectives:** To find out the correlation between Pain and Disability in Cervical and Lumbar Spine in Two- Wheeler Riders Among Physiotherapy Profession based on Neck Disability Index (NDI), Oswestry Disability Index and Numeric Pain Rating Scale (NPRS).

**Method:** 30 young adults with neck and low back pain between 20-30 years, Riding bike more than 1 year were assessed for pain and disability.

**Result:** Data was analyzed by Pearson's Correlation Coefficient suggesting strong positive correlation between Neck pain with Neck Disability ( $r = 0.53$ ) and Low back pain with Low back Disability ( $r = 0.44$ )

**Conclusion:** There is a significant positive correlation between pain and disability of cervical and lumbar spine

**Keywords:** Neck Disability Index; Oswestry Disability Index; Neck Pain

### Abbreviations

QoL: Quality of Life; NDI: Neck Disability Index; ODI: Oswestry Disability Index; NPRS: Numeric Pain Rating Scale; LBP: Low Back Pain; NSLBP: Nonspecific Low Back Pain

### Introduction

The motorcycle often called a bike, motorbike is recognized as an important form of transport as they suit a range of different

purposes: long distance travel, sport including racing and off-road riding. They are usually preferred compared to four wheelers as they are compact, consumes less fuel, pass easily through congested areas. In spite of the above advantages, motorcycle riding is relatively complex and risky process. On the other hand, the health problems are also increasing parallel to the rate of population growth. Furthermore, motorcycle related issues have also been a concern for road safety. The musculoskeletal disorder

is a common health problem throughout the world affecting not only industrial sector people but also the general population. The musculoskeletal disorder is a major health problem that affects the quality of life causing morbidity, increase in demand for health care and cost. Musculoskeletal pain affects all ages, reoccurs most time and its frequency increases with age [1].

India is a developing nation with crowded streets, limited parking spaces, ever increasing fuel prices and limited spending capacity over transportation, making two wheelers one of the most preferred modes of commute in Indian cities and rural areas. In 2014 to 2015, two-wheeler population in the state of Maharashtra contributed to 72% of the total number of vehicles. Good amount of data is available on mortality and morbidity associated with two wheelers due to their proneness to accidents, but there are very limited data available on demography of cumulative trauma disorders, and the significance of its impact on daily two-wheeler commuters. Motorbike riders are relatively more exposed to sitting posture hazard compared to car drivers. Current design of motorbike in market is not equipped with back leaning postures support features for rider which leads to the lower back pain in the riders [10]. Use of helmets can also cause discomfort due to their heavy weight and thus compacting the head of the rider.

Back and neck pain is one of the most common health complaints. Back pain affects approximately 80% of adults at some point in their lives and neck pain; approximately 50%. Back and neck pain can be experienced by people of all ages but can be treated by qualified physiotherapists by a range of treatments. Being caught up in the rush of life, we spend a good deal of time on the roads. And our bumpy roads, punctuated by pot holes, with the bitumen topping disappearing after a slight shower, contribute to a host of health problems [5]. In particular, they take a heavy toll on the musculoskeletal system the back, neck and the spine. Bad roads can cause back and neck problems, particularly in those commuting long distances on a daily basis. As it is, younger people, those in the IT and other industries located on the outskirts, which do a great deal of travelling by road and use two wheelers, are more affected than the elderly, However, when we land in a pothole while riding a bike, the spine absorbs an impact that is much higher, if the vehicle suspension is in not-so-good condition, the individual is forced to absorb the shock instead of the vehicle's shock absorber and another one fact for two wheelers, the size of the tire is definitely a reason for not absorbing the shock or transferring it with reduction of impact. A large number of people suffer from back and neck pain

due to driving on bad roads. The problem then will become chronic and recurrent [7].

Low back pain (LBP) is the primary worldwide cause of years lived with disability according to a report of the Global Burden of Disease. Approximately 80% of people experience activity-limiting LBP at some point in their lifetime, and approximately 5% develop chronic LBP lasting for more than 3 months. Costs associated with LBP represent a serious burden to society, and lost work productivity accounts for the bulk of these costs. Approximately 90% of patients with LBP are labeled as having nonspecific low back pain (NSLBP) because a specific cause for their pain cannot be found.

The Musculoskeletal disorder is a common health problem throughout the world, affecting not only industries but also the general population. Transportation sectors also face the same arising problem especially in the western countries where modes of transportation are diverse and convenient [1]. Numerous studies have been conducted on the occupational health of bike rider, little is known about the prevalence of musculoskeletal disorders among motorcyclists, mainly for those who utilizes motorcycles as part of their daily transportation and for leisure activities. Motorbike riders are relatively more exposed to sitting posture hazard compared to car drivers. Current design of motorbike in market is not equipped with back leaning postures support features for rider which leads to the lower back pain in the riders. Use of helmets can also cause discomfort due to their heavy weight and compacting the head of the rider thus leading to neck pain.

There are some studies focusing on neck and low back pain. So, there is a need to analyze the pain and disability in cervical and lumbar spine in two-wheeler

## Materials and Methods

A descriptive study on 30 young adults with neck and low back pain between 20-30 years, were done in bike riders who were riding bikes more than 1 year more than half an hour 5 times in a week. They were assessed on the outcome measures as NDI, ODI, NPRS to evaluate pain and disability. Individuals with History of recent orthopedics injuries like fracture (less than six months), spinal deformities, Prolapse Intervertebral disc and pregnancy were excluded from the study.

The ethical approval was taken from the institutional ethical committee. Individuals were screened based on inclusion and

exclusion criteria. Total 30 subjects were taken. Aims and objectives of the study were explained and written consent were taken from each of the individuals participating in this study. Proper guidance and explanation about Neck Disability Index, Oswestry Disability Index and Numeric Pain Rating Scale were given to individuals and they were asked to mark the answers of questions properly on the spot in front of investigator to ensure that there was no doubt present within the individuals and also to ensure that there was no confusion happening while filling the questionnaires. The questionnaires were collected and scored. Further data was analyzed by using appropriate statistical tests.

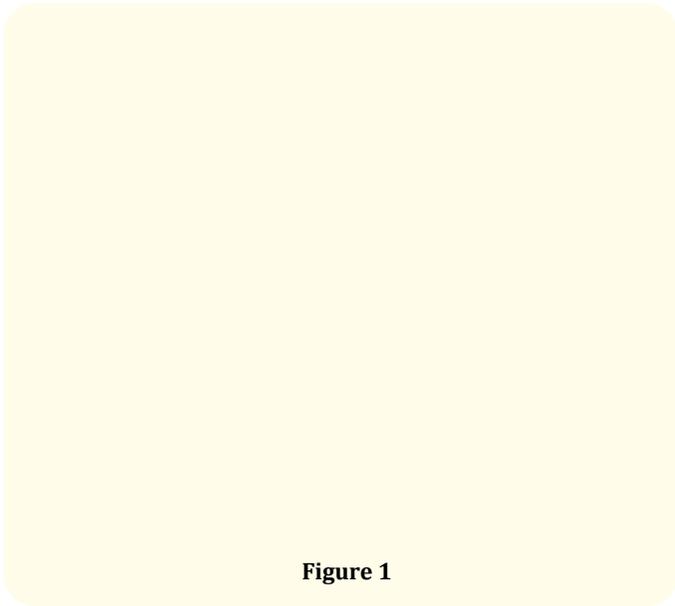


Figure 1

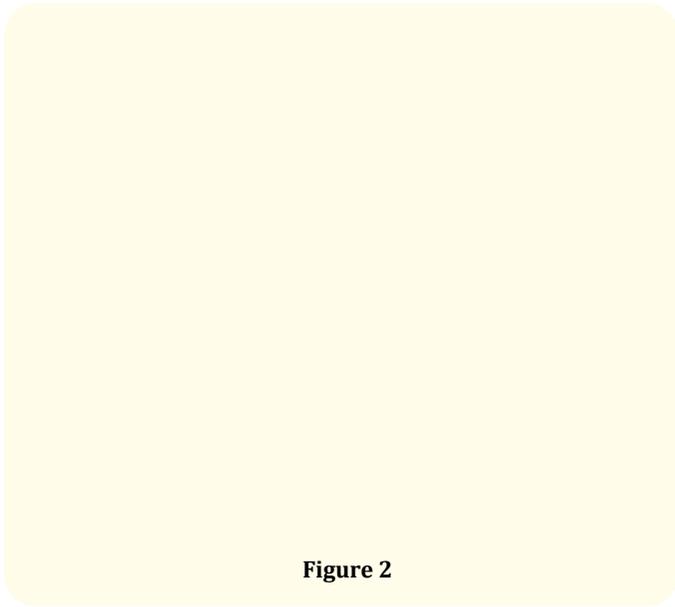


Figure 2

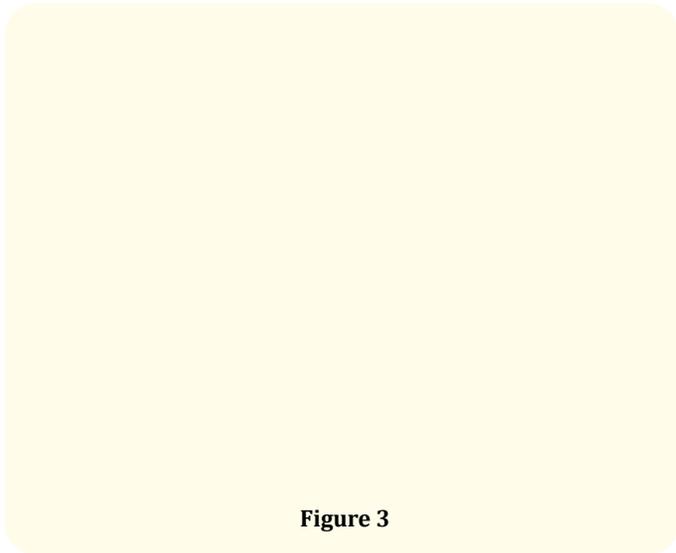


Figure 3

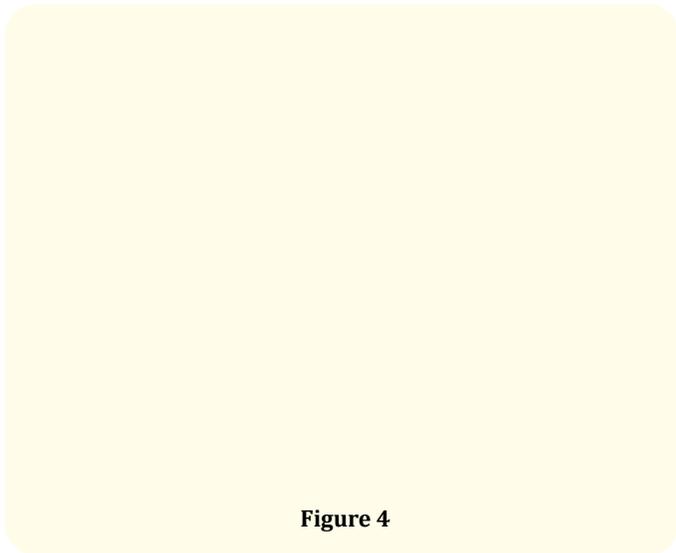


Figure 4

### Result and Discussion

Data analysis was done by using Pearson’s correlation coefficient.

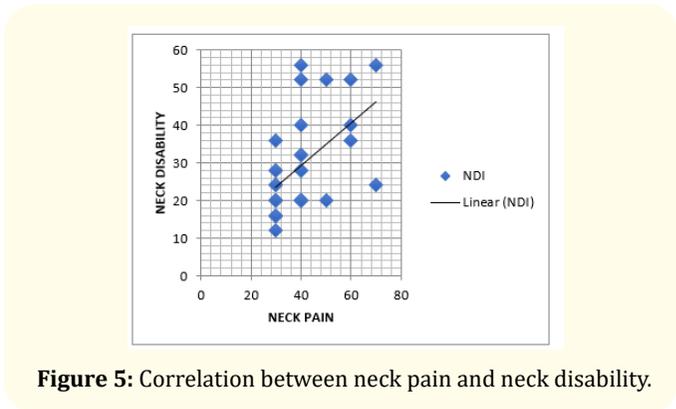
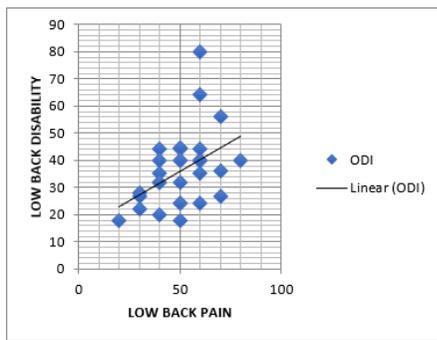


Figure 5: Correlation between neck pain and neck disability.



**Figure 6:** Correlation between low back pain and disability.

- There is a significant positive correlation between Pain and Disability of Cervical spine with  $r = 0.53$  on Pearson’s correlation coefficient.
- There is a significant positive correlation between Pain and Disability of Lumbar spine with  $r = 0.44$  on Pearson’s correlation coefficient.

The above graphs show the graphical representation saying that there was a significant positive correlation between neck pain and neck disability as well as low back pain and low back disability.

Motorbike is recognized as an important form of transport as they suit a range of different purposes: long distance travel, sports including racing and off-road riding. They are usually preferred compared to four wheelers as they are compact, consumes less fuel, pass easily through congested areas. With increase in the population there is also an increase in the usage of motorbikes. Thus, also increasing the risk factors associated with neck and low back pain.

In this study we had included 30 bikers in which there were 15 males and 15 females were selected in order to prevent any kind of bias. The disability of neck and low back is calculated using the questionnaires Neck Disability Index and Oswestry Disability Index. After calculating the questionnaires, we found out that the subjects were having more disability in low back than the neck.

The pain was assessed using the Numerical Pain Rating Scale. This scale was used to assess the pain of neck and low back on activity and on rest. With this we found that the pain intensity of low back was more than the pain intensity of neck.

Back and neck are the most common affected areas for health problem related to usage of two-wheeler vehicles. There are many factors affecting such as bad roads, heavy helmets, low vehicle maintenance, incorrect posture while riding, vibration injury, etc. If not given proper attention then the problem might become chronic and recurrent.

The mentioned graphs depicts that there is a significant positive correlation between neck pain and disability and between low back pain and disability. The limitations of this study were small sample size was taken and the type of bike was not mentioned.

### Conclusion

This study concludes that there is a significant positive correlation between Pain and Disability of Cervical and Lumbar spine.

### Acknowledgements

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### Conflict of Interest

We declare there is no conflict of interest.

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