

PREVALENCE OF NECK PAIN AMONG RICKSHAW DRIVERS IN LAHORE, PAKISTAN

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Received: June 21, 2024

Revised: July 31, 2024

Accepted: August 12, 2024

Published: August 24, 2024

ABSTRACT

Complete mental, physical, and social well-being is defined as health. (MS, 1991) Factors like working hours, posture, ergonomic practices, and social stress can impact one's health. (Mortimer JT, 1996) Rickshaw drivers, due to their job's nature, are at high risk of musculoskeletal disorders and severe neck pain. This study determines to assess the impact of neck pain. We surveyed by using the NDI questionnaire. We took a sample of 96 rickshaw drivers and a questionnaire of 10 sections, scored from 0-5, to evaluate the severity of neck pain. The results showed an average NDI score of 14 among rickshaw drivers that reported 4% had a complete disability, 15% had a severe disability, 25% had a moderate disability, 39% had a mild disability, and 17% showed no disability. In short, several degrees of neck pain disability are presented among the rickshaw drivers of Lahore. It shows that addressing occupational health risks is essential.

Key Words: Lahore, musculoskeletal disorders, neck pain, occupational health, Pakistan.

INTRODUCTION

One of the most common occupational health issues is neck pain, and it is recognized globally. Neck pain is affecting professionals across many occupations. Numerous internal and external factors contribute to musculoskeletal problems and postural defects as a dominant concern. The cervical region or the neck connects the thorax with the head, which serves as a crucial anatomical design. It facilitates the connection between the limbs and the trunk and supports by enabling the movement of the head in multiple directions. It houses nerves, respiratory passages, and blood vessels, making it one of the body's most sensitive and important areas due to its functionality. In South Asian urban areas, rickshaw driving is one of the most common occupations, and there are many factors that increase the risk of this condition in rickshaw drivers. Some important factors are prolonged sitting, continuous vibration, physical posture to handle steering, and driving in congested city

streets. rickshaw drivers not only experienced considerable biomechanical stress but also worsened due to the long hours of sitting, poor ergonomic practices, and repetitive movements. Neck Pain is a widespread issue, according to the studies. Approximately 46% of people experienced it once in their lifetime. This condition reduces the quality of work and life productivity and can seriously affect and limit daily life activities (ADLs). We identify physical therapy as a practical approach to managing musculoskeletal issues that are related to the neck region. We have seen considerable research focused on the pain in neck regions in many occupational areas. However, we observed a noticeable gap in the literature related to this condition in rickshaw drivers as their work is essential and physically demanding in urban transportation.

Anatomy of the Neck

The uppermost portion of the vertebral column consists of the cervical spine, and it lies between the thoracic vertebrae and the cranium. The cervical spine has seven different vertebrae, each named C1 to C7. C1 (atlas) and C2 (axis) are the first two vertebrae that allow the rotational and nodding movement of the head. Other neck movements, such as the rotation of the entire neck, forward and backward movement, and side flexion, are due to the other cervical vertebrae. Three features differentiate the cervical vertebrae in the vertebral column. Three vertebrae that are important for the passage of vital structures are the triangular vertebral foramen, transverse foramina, and bifid spinous processes. (S, [English] 2020 [updated 17 June 2020; cited 2020 23 June 2020]; 59th:)

Muscles of the Neck

There are four categories of neck muscles: suprahyoid muscles, suboccipital muscles, scalene muscles, and infrahyoid muscles. The suprahyoid muscles include the digastric, stylohyoid, geniohyoid, and mylohyoid, which help in swallowing and balancing the hyoid bone. The suboccipital muscles, including the rectus capitis posterior major, obliquus capitis inferior, rectus capitis posterior minor, and obliquus capitis superior, form a triangle called the suboccipital triangle, involved in the smooth movements of the head. The scalene muscles are vital for the first two ribs' elevation during the respiratory process and the neck's lateral flexion. These muscles include anterior, middle, and posterior paired muscles. The infrahyoid muscles comprise omohyoid, sternothyroid, thyrohyoid, and sternohyoid muscles. They help swallowing by depressing the larynx and hyoid bone. (S, [English] 2020 [updated 17 June 2020; cited 2020 23 June 2020]; 59th:)

Nerve Supply of the Neck

The phrenic nerve and cervical plexus supply nerves to the neck. These nerves highlight the neck's essential and complex role in the body's mechanics and are critical for the motor and sensory functions of the neck, diaphragm, and shoulders.

Biomechanics of the Neck

The neck is a complex compound for functional and structural prospects. The neck region has vascular, neurologic, and respiratory structures, including cervical vertebrae and spinal cord. The studies show that the ratio of neck injuries is less than head injuries, yet the neck is most vulnerable to traumas in case of physical impact or accidents. Movements of the neck are possible due to its biomechanics, including reverse flexion, forward flexion, rotational moment, and side bend. (h, 2011) These neck movements are essential for all daily activities and affect the quality of life.

Neck pain is common in developed countries and is one of the significant causes of disability. Studies show that approximately 30-35% of the global population suffers neck pain. Moreover, 15% of them experienced chronic pain in the neck at least once in their lifetime. The most common factors that contribute to this condition are repetitive work, long hours of neck flexion, previous injuries, psychological job stress, and smoking. (IAftSo, 2009) In root compression cases, neck pain is accompanied by neurological symptoms. It results in muscle weakness, radiating pain, and sensory disturbance. In spinal-related neck problems, the most repetitive symptom is muscle pain. (M, 2019)

This study aimed to fill the noticeable gap in the research related to rickshaw drivers by assessing the prevalence of neck pain among rickshaw drivers in Lahore, Pakistan. Thus, contributing to a better understanding of the occupational health challenges faced by this essential workforce.

Literature Review

Neck pain is a common global health issue that affects several populations. Researchers have assessed the factors related to neck pain, such as risk factors, frequency, and consequences. These studies highlighted how many social and professional groups are being affected by this condition. To determine neck pain's duration and frequency, the researchers conducted a randomized and epidemiologic cross-sectional study.

The study, conducted by Bovim G et al., included 10,000 participants from a city in Norway. About 34% of these participants had experienced neck pain in the previous years, and 13% of them faced this issue in the previous six months. The study

concluded that this chronic pain in the neck is very symptomatic and common in the general public, more importantly, in women. (Guez M, 2002)

Similarly, two researchers, Michel Guez and Christer Hildingsson, conducted a retrospective cross-sectional study in 2009. The research aimed to look into the frequency of neck pain. The survey was based on 8,356 persons from the two areas of Sweden's northern regions. The study found that females faced a high prevalence of neck pain at 48% and males at 38%, while overall, 435 people experienced neck pain. We can classify the pain as chronic neck pain if it continues for more than six months. The study observed that chronic neck pain was more common in women. It was present in 22% of women and 16% of men. The study also discovered a relation between a history of other sorts of head pains, neck trauma, persistent neck pain, and whiplash injuries. (Bovim G, 1994)

Rene Fejer et al. executed a significant investigation during their systematic review to figure out neck pain in the global population and pinpoint differences in methodologies in the studies. The study looked into the information provided by five different databases include MEDLINE, EMBASE, CINAHL, OSH-ROM, and PsycINFO. The results showed that population-specific and regional differences are present in the prevalence of neck pain. The study showed that women are more affected by this condition than men if we make an exception for lifetime prevalence. The interesting part of this study was that Scandinavian regions experience more cases of neck pain than other regions of Europe and Asia. (Chiu T, 2002)

The research of Evangelos C Alexopoulos et al. focused on the prevalence of musculoskeletal conditions among dentists. The study included 430 dentists and was conducted in 2004. Alexopoulos et al. aimed to determine the relation between individual, psychosocial, physical features and musculoskeletal complaints. According to the survey results, 30% of participants had ongoing neck pain, while 62% of dentists had complaints of musculoskeletal issues. The study concludes that long hours of static postures, physical load, and repetitive body movements impact musculoskeletal disorders in dentists. (Abiodun-Solanke I, 2010)

Lloyd Long. Yu Chen et al. studied the prevalence of neck pain in undergraduate students. His cross-sectional study aimed to find the differences and comparisons of the prevalence of neck pain and its risk factors among multiple academic areas. This research includes 5,195 students from different universities, and it showed that 22% of students are suffering from neck pain. In contrast, the highest ratio of pain among students was seen in physiotherapy and nursing students, with 26% of them. The study figured out the most important risk factors of neck pain as well, and they were coexisting back pain and anxiety. A specific group that is more exposed to musculoskeletal disorders is otolaryngologists because of their occupational requirements. (Wolfe F, 1995)

Abd El Raouf Abou-Shady et al. aimed to study this group to determine the frequency of neck pain among them. They used Visual Analog Scaled and NDI (Neck Disability Index) for their survey, and they had a hundred senior surgeons and physicians for the survey. Among 100 participants, 69% of them faced frequent pain in the neck, and 80% of them were categorized as severe. The research pinpointed the importance of reducing this occupational risk and the need for ergonomic approaches. It depicted that otolaryngologist experienced frequent occupational neck pain. (NAE-RA-SRMERWEE-DMMIM, 2020)

Gokhan Ozer and Necla Benlier aimed to find the connection between migraines and neck pain. So, they conducted a cross-sectional study that included 50 migraine patients. The study figured out that 89% of patients experienced migraines and neck pain at the same time, and 11% claimed that they had experienced migraines and neck pain at different times. So, they concluded that neck pain has a connection with migraines, and neck pain could be a trigger or a part of migraines. (Özer G, 2020)

Finally, Mukharram M. Bikbov et al. needed a study to find out the prevalence of thoracic spine, neck, and lower back pain in Bashkortostan. To carry out the study, he included 5,397 participants from urban and rural areas of Russia. According to the results, 29% of patients experienced neck pain, 23% of patients suffered from thoracic pain, and 54% of patients suffered back pain. They also figured out that many variables are related to

these conditions, such as age, gender, high anxiety scores, elevated BMI (body mass index), and a high prevalence of cardiovascular issues. The researchers discovered that these musculoskeletal issues seriously affect Russia's public health. (Bikbov MM, 2020)

Although the studies have revealed how common neck pain is in a variety of occupations and demographics. It figured out that different risk factors like occupation, stress, gender, age, and past trauma play a vital role in the prevalence of this condition. However, this study has a gap related to the frequency of neck pain in rickshaw drivers. The drivers are at high risk of having these conditions due to their work's biomechanical and physical requirements. This research aimed to fill this gap by conducting extensive research on the prevalence of neck pain among rickshaw drivers in Lahore, Pakistan.

Objectives

1. The main objective of this study is to determine the risk factors and prevalence of neck pain among rickshaw drivers and assess the severity and frequency of this condition in Lahore, Pakistan.
2. This study finds particular occupation factors that cause neck pain among rickshaw drivers in Lahore, Pakistan. These factors include long sitting hours, long driving hours, vibrations, and handling the rickshaw.
3. To assess the effect of this neck pain on the daily life and activities of rickshaw drivers in Lahore, Pakistan. This study aims to determine how neck pain can seriously impact rickshaw drivers' quality of life and work performance.
4. This study aims to recommend methods to reduce the prevalence of neck pain among rickshaw drivers. These practical suggestions include changes in work practices, ergonomic interventions, and the arrangements for health education programs for rickshaw drivers in Lahore.

Operational Definitions

1. Neck Pain

Experience pain and discomfort in the cervical region, the area between the thorax and head, is called neck pain. (relief mcgtp, 2020)The pain may start at any age and in any gender due to poor posture, muscle strain, and other reasons like osteoarthritis. The severity of neck pain can lead to serious health issues if not treated properly.

2. Prevalence

Prevalence can be defined as the number of specific symptoms, diseases, or conditions that occur in a particular group of people or occupation over a specified period. (health NIom, 2020) In this research, prevalence refers to the number of rickshaw drivers who suffered from neck pain within a timeframe.

3. Rickshaw Driver

Rikshaw is a vehicle with three wheels and it is designed for the passengers in urban areas f Lahore. Rikshaw drivers is the individual who drives this vehicle. (rickshaw, 2013) In this study, rikshaw driver is term that is being used for those who drive rikshaws in the urban areas of Lahore for public transportation.

Materials and Methods

In this section, we will explore the procedures and strategies used in this observational study related to neck pain among rickshaw drivers in Lahore, Pakistan.

1. Study Design

This study used a descriptive cross-sectional study design. This design helps to assess the issue within a specific time period and provides a glimpse of its severity in a targeted population.

2. Duration of Study

The researchers gathered the data over a six-month period, starting after they got the authorities' approval for the research. They collected enough data to depict the targeted population, and the extended timeline ensured the process.

3. Target Population

The researchers selected the group of rickshaw drivers in Lahore, Pakistan to assess the

prevalence of neck pain among this particular occupational group due to their exposure to the activities which may lead them to neck pain.

4. Sampling Technique

The researchers used a non-probability sampling strategy due to its flexibility and convenience. This method made choosing people to participate in the study easy and quick. It also made it possible to guarantee the study's completion within an allotted time frame.

5. Sample Calculation (Systems CR, 2020)

The sample size for the study was determined using the following formula:

$$ss = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where:

1. Z is the value for a 95% confidence level (1.96)
2. P is the estimated ratio of the population who showed interest (ensured a sufficient sample size that was 0.50)
3. C is the margin of error (described as a decimal, e.g., 0.04 for a ±4%)

The estimated sample size for the study was 96 rickshaw drivers by using this formula. This size was chosen to ensure that the findings would be statistically significant and representative of the population.

6. Inclusion Criteria

Rickshaw drivers who fulfil the following criteria are included in the study. They must be between 20 to 40 years of age. There are working hours six days a week, which must be at least 8-10 hours daily. Rickshaw drivers who live in Lahore. These criteria were set to follow the scope of the research. So, drivers who are more likely to be exposed to risk factors related to neck pain are included in the research.

7. Exclusion Criteria

The following exclusion criteria were introduced to reduce confounding variables that may badly

impact the research. Rickshaw drivers who do not live in Lahore are excluded from the research. Drivers who suffered from trauma injuries and neuropathic conditions were not allowed to join the research. Drivers who experienced pre-existing neck pain and musculoskeletal disorders were not included in the study.

Data Analysis Procedure

1. Software Used

The study analyzed the data using the Statistical Package for the Social Sciences (SPSS) version 21.0. SPSS is a tool for data management during research and data collection. It is a powerful statistical tool that helps to represent data graphically and statistically analyze it.

2. Descriptive Statistics

The study calculated the descriptive statistics for quantitative variables. The NDI score included an average score (mean) and a measure of variables (standard Deviation). The standard Deviation provides data regarding the participants' disability level, which changes according to the severity of the issue. The mean offers an overall disability level of neck pain among the participants.

3. Frequency Distributions

Frequency distribution helped the research categorize the sample based on the NDI score. The NDI score was categorized into multiple levels of the condition. This classification helped the researchers to get a clear picture of the serenity and prevalence of neck pain in this population and quantify the ratio of rickshaw drivers facing different levels of neck pain.

- 3.1. No disability (0-4 points)
- 3.2. Mild disability (5-14 points)
- 3.3. Moderate disability (15-24 points)
- 3.4. Severe disability (25-34 points)
- 3.5. Complete disability (35-50 points)
(Macdermid JC WD, 2020)

4. Data Visualization

The study presented its numerical analysis using graphs and charts. It usually presented the distribution of participants' NDI scores. This visual aid aimed to clarify the insights and understand the prevalence of neck pain among rickshaw drivers.

5. Interpretation of Results

The results showed the contributing factors and how widespread neck pain is among rickshaw drivers in Lahore, Pakistan. These results interpreted the implications of ergonomics interventions for occupational health, scheduled working hours, and the need for health programs to spread awareness to address the prevalence of this condition.

Methodology

1. Study Type and Approach

The cross-sectional design of this study is well-suited to assessing the prevalence of a specific issue, such as neck pain. The research was able to identify widespread neck pain within a particular time frame among rickshaw drivers in Lahore without following members for a long period of time.

2. Data Collection Instrument

The Neck Disability Index (NDI) questionnaire was the main tool for data collection in the study. The NDI is commonly used to assess a particular condition and its impacts on daily activities. The questionnaire includes 10 sections, such as sleeping, driving, working hours, concentration, reading, lifting, personal care, headaches, and recreation. Each section scored from 0 to 5. A higher score showed greater disability.

3. Participant Recruitment and Sampling

The study used a non-probability convenient sampling technique due to its flexibility and practicality. This technique allows researchers to select willing and readily available rickshaw drivers in Lahore. The sampling recruitment was conducted in highly populated areas with rickshaw drivers, such as transport hubs, markets, and residential areas. This ensured that a diverse sample of participants was collected.

4. Sample Size Determination

The researchers used a statistical formula that considered the confidence level, estimated ratio of the affected population, and acceptable margin of error. According to the calculation, the required sample size was 96 participants. This was enough to provide

insights and achieve statistically useful results about the prevalence of neck pain among rickshaw drivers in Lahore.

Results:

The following results are collected after a thoughtful consideration of the process.

1. The results showed the age frequency of the participants. 30% of the participants were aged 25 to 30, 33% were aged 30 to 25, 15% were aged 20-25, and 12% were aged 35-40.
2. Regarding the frequency of pain scale during movement, 41% of participants complained of moderate pain, 24% faced mild pain, 16% faced no pain, 10% faced severe pain, and 2% faced the worst pain.
3. While examining the personal care of participants, 45% reported that they needed some help but somehow managed themselves. 25% reported that the pain made them slow to do personal care. 13% managed their personal care but experienced extra pain. 9% of participants needed help in most of their daily personal care activities. And 8% of participants had no pain in personal care.
4. Conjugating the lifting scale frequency in rickshaw drivers, 37% of participants were able to lift anything without any pain. 21% were not allowed to lift heavy objects due to pain, and 17% were only able to lift lighter objects. 13% reported that they feel pain but can lift anything, and 11% reported that somehow, they managed to lift a light object.
5. Let's look at the reading index of participants. 30% were able to read for a long time with moderate pain. 25% could read while facing slight pain, and 17% reported being able to read without any pain. 11% reported being unable to read for a long time due to pain, 10% faced difficulty due to intense pain, and 6% were not able to read at all.
6. The study showed that 27% of dieters faced moderate headaches infrequently, 25% faced headaches frequently, 20% faced slight headaches infrequently, and 10% had no headache. 9% of participants faced frequent severe headaches, while 8% had a full-time headache.
7. If we look into the insights of neck contraction frequency among drivers, 33%

were able to move their neck but with slight difficulty, 26% could move their neck comfortably, 21% could move their neck with a fair degree with slight pain, 11% suffered a lot of pain, and 8% suffered a lot of difficulty while moving their neck.

8. Work frequency among rickshaw drivers showed that 33% of participants were able to do most of their daily work, 28% were able to do lots of work without any pain, and 24% were able to do their usual work. While 8% of them complained that they could do just a little bit of their work, 6% of drivers were not able to do their work due to neck pain.
9. The results should show that on the frequency of driving scale, 38% of participants said they drive with slight pain, 23% of them drive with moderate pain, 22% of them drive without any pain, 10% could hardly drive, and 6% were not able to drive at all.
10. According to the data, 29% of rickshaw drivers experienced some disturbed sleep, 27% had slightly disturbed sleep, and 24% had no trouble sleeping. 12% of participants complained they had moderate disturbance in sleeping, 5% experienced a lot of disturbance in sleep, and 2% had complete disturbance in sleep.
11. 36% of drivers reported they have some recreation frequency but no more due to neck pain. 29% of them could engage in many activities with slight pain, 21% had no pain, 12% could engage in very little activities, and 2% were not able to participate in any activities.
12. Studying the average NDI score of rickshaw drivers showed that 4% experienced complete disability, 15% had severe disability, 17% had no disability, 25% had moderate disability, and 40% had mild disability.
- 13.

Discussion

Men are more affected by musculoskeletal injuries, including neck pain than women due to their occupational activities. Several factors, including occupational demands and the body's movement, contribute to this discrepancy. This study focused on the most overlooked and unique area of the work-related population: rickshaw drivers aged

between 25 to 40 years following the prolonged hours of 6-8 hours of driving. The results of this study aimed to highlight the prevalence of neck pain and its effects among rickshaw drivers.

The results showed a 14 NDI score among this occupational group, which is an indication of mild disability. The driving posture of rickshaw drivers includes sitting with extended arms, one hand extending to operate the accelerator, and the neck flexed to the windshield, exposing rickshaw drivers to serious biomechanical stress on shoulders, neck, and upper limbs. The key factor behind the high prevalence of musculoskeletal disorders is this repetitive tightness.

In comparison to past studies, we found that within the last year, 34% of the general population had experienced neck pain. Our results highlight a similar proportion of neck pain among this particular occupational group. However, our study focused on the rickshaw drivers who are at higher risk of the physical demands of their job. Our study resulted in a slightly higher prevalence of this condition among male rickshaw drivers compared to the results of Muchel Guz and its associates, which showed a greater prevalence of neck pain among females. However, the results align with the understanding that neck pain is a common and global issue.

The insights we present in this study are crucial for healthcare professionals who focus on ergonomics and musculoskeletal health in the workplace. There is a need to emphasize the targeted interventions and identify key factors like smoking, past medical history, stress, prolonged neck flexion, and, more importantly, distance between arms and the handles. Chronic neck pains are the results of biomechanical factors like seating with a hunch back, sustained flex neck pose. These factors contribute to muscle irritation and fatigue.

This study urged the need for initiatives aimed at counseling and educating the rickshaw drivers. They should be encouraged to maintain a muscular balance and a better posture during driving hours.

This study provides valuable data on the prevalence of neck pain and highlights the importance of continued research. To reduce the issue of musculoskeletal disorders, we need to address the particular occupational risk factors experienced by rickshaw drivers and help them improve their quality of life.

3. under particular circumstances and time to complete it conveniently.
4. There is limited data, and it cannot be implemented internationally due to its particular purpose and circumstances.

Recommendations

The researchers found a dire need for education and counselling of rickshaw drivers in Lahore. We need to educate them about muscular balance and posture. The rickshaw drivers must know the difference between non-driving and driving posture. Detailed and extensive studies are needed to find the solution and evaluation of neck pain in this particular occupational group.

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Limitations:

There are a few limitations in this research. Let's have a look.

1. This study includes rickshaw drivers of Lahore but has no international data. For this reason, the insight provided in the study can be biased.
2. This study is conducted to fulfil degree, Bashkortostan, Russia: the Ural Eye and Medical Study. *BMC Musculoskeletal Disorders*. 2020;21(1):64.

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