

# Prevalence Of Non-Specific Upper Back Pain in Professional Bus Drivers

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**Abstract—Background:** Professional bus drivers face significant risks of developing musculoskeletal disorders (MSDs) due to the nature of their work, which involves prolonged sitting, repetitive movements, exposure to vibration, and manual tasks such as lifting and maneuvering vehicles. These factors contribute to discomfort and pain in various body regions, particularly the spine, shoulders, back, neck, and knees. Drivers often experience lower back pain, neck and shoulder tension, and discomfort in the upper and lower extremities. To mitigate the risk of MSDs, interventions focused on ergonomics, posture awareness, regular breaks, and targeted exercises are essential. Employers must prioritize driver well-being by providing ergonomic seating, promoting proper posture, and offering training on lifting techniques and managing discomfort. Addressing these challenges is crucial for safeguarding the health and productivity of professional drivers, especially given their integral role in the transportation industry and the economic growth of regions like India.

## **Method:**

The study aimed to investigate the prevalence of non-specific upper back pain in professional city bus drivers. Subjects were selected from Kolhapur municipal transport and assessed using diagnostic criteria i.e. On palpation and on observation and NPRS scale. Inclusion and exclusion criteria were considered, and subjects willing to participate were included after receiving an explanation of the study's nature.

## **Result:**

In this study of 96 participants, pain complaints varied across age groups, with 30 participants reporting pain. The Numeric Pain Rating Scale (NPRS) revealed that 60 participants had no pain, while 36 participants reported varying degrees of pain severity. Upon observation, redness and swelling were observed in a small percentage of participants, with swelling being more prevalent.

Palpation diagnostic criteria indicated tenderness and spasm, with tenderness present in only one participant and both tenderness and spasm present in 33

participants. These findings suggest a varied presentation of pain and associated symptoms among the participants, with swelling being a notable observation.

## **Conclusion:**

The goal of our study was to investigate the prevalence rate of non-specific upper back pain in professional city bus drivers. According to our research, out of 96 subjects participating in the study, 37% complain of pain and remaining 63% don't show any symptom's regarding nonspecific upper back pain. Non-specific upper back pain is likely to be more in 41-45 age group.

**Index Terms—**Non-specific upper back pain, professional city bus drivers, prevalence, long term outcomes.

## I. INTRODUCTION

The back is covered by superficial and deep fascia. The superficial connective tissue acts as a layer of thickness and strength. It consists of areolar connective or fatty tissue that is only deep to the skin of the back. This fascia is continuous with the superficial fascia of the cervix, buttocks and upper limbs. The deep fascia of the neck and back, a dense fibrous structure, is attached to the collarbone, the spine of the vertebrae and the iliac crest. The middle fibres of the sacrum and the upper fibres of the internal oblique muscle are located as the pectoral fascia. In addition, there are several connections between the parts of the thoracic vertebrae and the ribs, and between successive vertebrae.<sup>15</sup>

Back muscles are divided into three categories. The first category is the superficial back muscles; they are part of the external back muscle. These muscles are located superficially and help the movement of the upper limbs.

Superficial muscles include:

1. Trapezius

Origin of superior occipital line, occipital protuberance, occipital ligament, and C7-T12 articular processes\attachments to clavicle, acromion, and lateral third of scapular spine\innervated by first cranial nerve).

2. Levator scapulae

True from the transverse processes of the first four cervical vertebrae Insertions from the upper angle of the scapula Innervated by the dorsal scapular nerve

3. Rhomboids minor

True from the cervical ligaments and spinous processes of C7-T1 Inner-T11. At the top of the medial border of the scapula (the line between the superior and trigone angles of the scapula between Nervated by the dorsal scapular nerve.

4. Rhomboids major

True T2-T5 spinous processes Attaches to the lower scapula at the medial border of the scapula (the line between the lower corner of the scapula and the triangle) Nervated by the dorsal scapular nerve.

Driving is not just a profession but a crucial component of the economy, facilitating the movement of goods and people, powering industries like logistics, transportation, and tourism, thereby playing a pivotal role in sustaining economic activities and growth.<sup>15</sup>

Professional bus drivers work in a profession that requires them to drive and operate public transportation buses for extended periods of time. Professional bus drivers play a crucial role in the transportation industry by safely driving and operating public transportation buses for extended durations. They ensure the smooth flow of passengers to their destinations while adhering to traffic regulations and maintaining a high level of focus and attention throughout their shifts. Additionally, they often provide excellent customer service, assisting passengers with boarding, fare collection, and route information. Moreover, professional bus drivers must undergo rigorous training and possess a thorough understanding of vehicle mechanics and safety protocols to handle various situations effectively.<sup>3</sup>

Professional drivers, by the very nature of their occupation, are highly susceptible to developing

musculoskeletal disorders (MSDs) that affect a wide array of body regions. The nature of their work involves prolonged periods of sitting and repetitive movements, placing significant strain on various parts of the body. As a result, drivers commonly experience discomfort and pain in multiple areas, including the spine, shoulders, back, neck, and knees, as well as in both the upper and lower extremities. The spine is particularly vulnerable to the adverse effects of prolonged sitting and constant vibration from vehicle movement. Drivers frequently report lower back pain, which can result from prolonged compression of the lumbar spine and poor posture while driving. Additionally, the repetitive motion of steering and operating pedals can lead to strain and tension in the neck and shoulders, contributing to discomfort and stiffness in these areas. Moreover, prolonged sitting without adequate breaks or ergonomic support can lead to increased pressure on the knees and hips, potentially exacerbating existing conditions or predisposing drivers to develop musculoskeletal issues in these joints. Over time, these cumulative stressors can manifest as chronic pain, reduced range of motion, and decreased overall comfort, impacting both the physical health and occupational performance of professional drivers. To mitigate the risk of musculoskeletal disorders among professional drivers, interventions focused on ergonomics, posture awareness, regular breaks, and targeted exercises are essential. Implementing ergonomic seating and adjustable lumbar support can help alleviate pressure on the spine and promote proper alignment. Encouraging drivers to take frequent breaks to stretch and change positions can alleviate muscle fatigue and reduce the risk of developing MSDs. Additionally, providing education and training on proper lifting techniques, ergonomic driving postures, and strategies for managing discomfort can empower drivers to take proactive measures to safeguard their musculoskeletal health. By addressing the unique challenges faced by professional drivers and implementing proactive interventions, employers can help mitigate the prevalence and impact of musculoskeletal disorders in this population, ultimately promoting the well-being and productivity of their workforce.<sup>1</sup>

II. RESULTS

| TABLE ANNEXURE |       |      |
|----------------|-------|------|
| Variable       | Mean  | SD   |
| Age            | 26.40 | 3.38 |

| On observation | Frequency(n) | Percentage (%) |
|----------------|--------------|----------------|
| Redness        | 4            | 4%             |
| Swelling       | 3            | 3%             |
| Both           | 3            | 3%             |
| Absent         | 86           | 90%            |
| Total          | 96           | 100%           |

Table 1: Prevalence of non-specific upper back pain according to on observation criteria.

| On palpation | Frequency(n) | Percentage(%) |
|--------------|--------------|---------------|
| Spasm        | 0            | 0%            |
| Tenderness   | 1            | 1%            |
| Both         | 33           | 36%           |
| Absent       | 62           | 63%           |
| Total        | 96           | 100%          |

Table 2: Prevalence of non-specific upper back pain according to on palpation criteria.

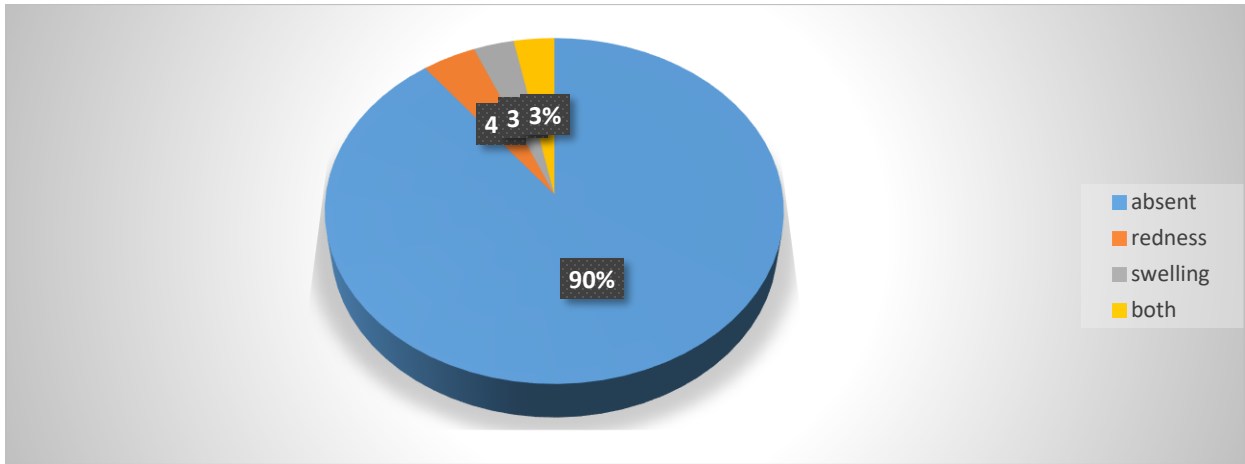
| NPRS scoring | Frequency(n) | Percentage(%) |
|--------------|--------------|---------------|
| 0 no pain    | 60           | 63%           |
| 1-3 mild     | 1            | 1%            |
| 4-6 moderate | 17           | 18%           |
| 7-10 severe  | 18           | 18%           |
| Total        | 96           | 100%          |

Table 3: Prevalence of non-specific upper back pain according to NPRS scale criteria.

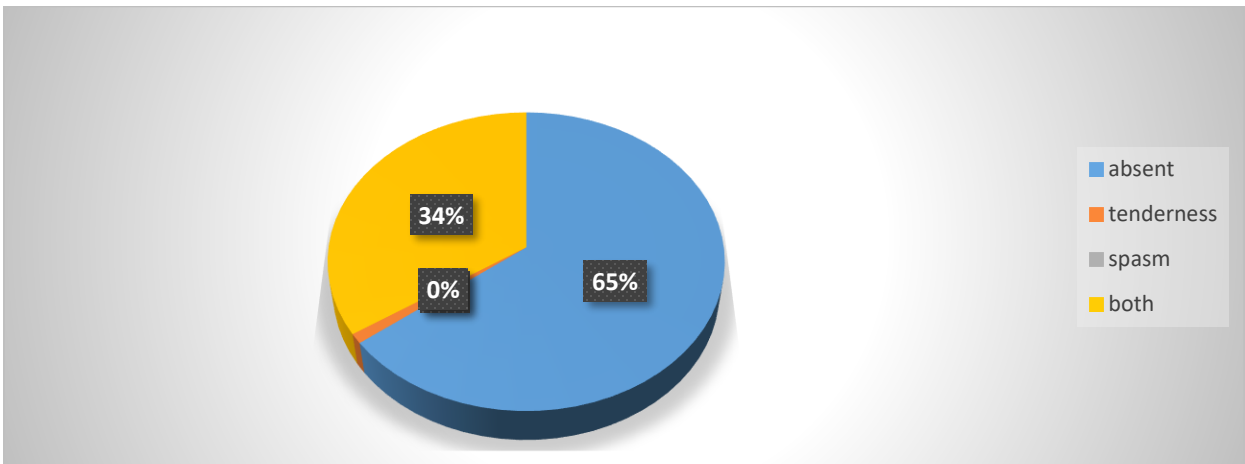
| Age Group | Frequency(n)<br>With pain | Frequency(n)<br>Without pain | Percentage (%) |
|-----------|---------------------------|------------------------------|----------------|
| 30-35     | 2                         | 5                            | 7%             |
| 36-40     | 10                        | 19                           | 30%            |
| 41-45     | 24                        | 36                           | 63%            |
| Total     | 36                        | 60                           | 100%           |

Table 4: Prevalence of non-specific upper back pain according to age group.

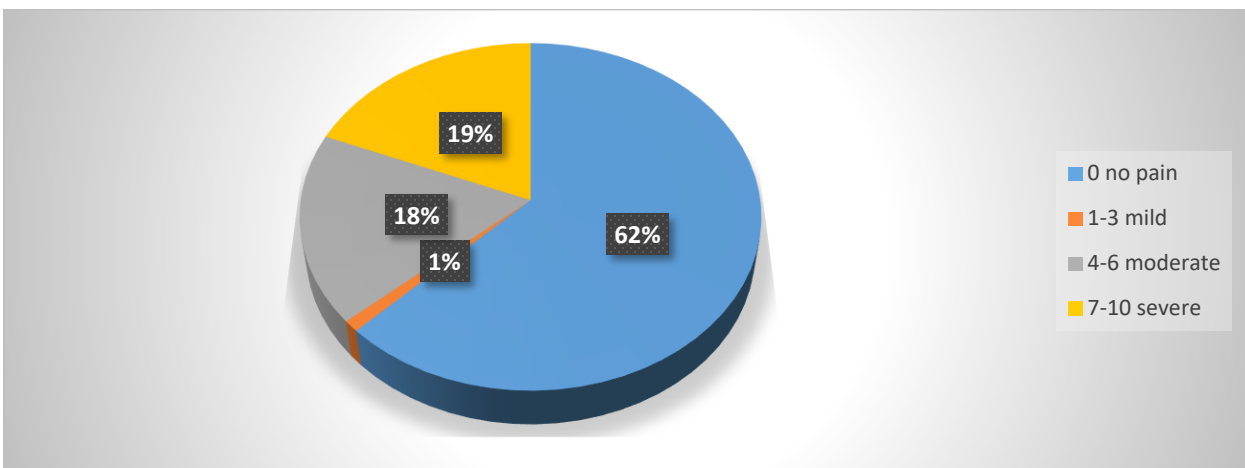
GRAPH ANNEXURE



Graph 1: Prevalence of non-specific upper back pain according to on observation criteria



Graph 2: Prevalence of non-specific upper back pain according to on palpation criteria.



Graph 3: Prevalence of non-specific upper back pain according to NPRS scale criteria.

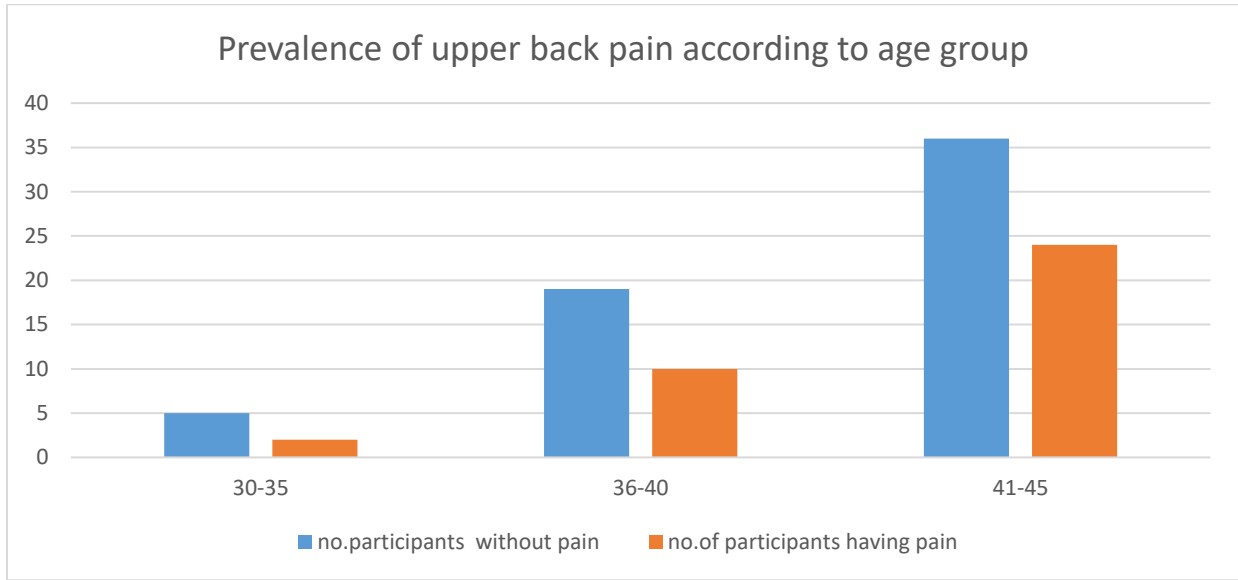


Table 4: Prevalence of non-specific upper back pain according to age group.

### III. DISCUSSION

In recent years, the occupational health and well-being of professional drivers, particularly those operating city buses, have become increasingly pertinent. This study delved into the prevalence of nonspecific upper back pain, shedding light on the unique challenges faced by this specific group. Building upon existing literature, which has highlighted the heightened risk of musculoskeletal issues among individuals engaged in long hours of driving, the research focused specifically on city bus drivers due to the distinct demands of their profession. The findings underscored the significant impact of prolonged sitting postures associated with driving heavy vehicles, emphasizing the need for targeted interventions to alleviate and prevent upper back pain among this occupational cohort.<sup>3</sup>

Furthermore, the study's implications extend beyond mere identification of the issue to the imperative of implementing proactive measures to mitigate its prevalence and severity. As urban transportation systems rely heavily on the efficient and safe operation of city buses, the well-being of drivers is paramount not only for their individual health but also for the overall functionality of public transit systems. By elucidating the prevalence of upper back pain in this demographic, the research serves as a catalyst for the

development of ergonomic interventions, tailored exercise regimens, and workplace policies aimed at promoting driver health and reducing the incidence of musculoskeletal discomfort. Ultimately, addressing the occupational health concerns of professional city bus drivers is not only a matter of individual well-being but also essential for the sustainability and effectiveness of urban transportation networks.<sup>3</sup>

The study revealed that a significant proportion, specifically 37%, of drivers experience musculoskeletal pain in their upper back. This underscores the importance of addressing ergonomic concerns and implementing interventions to alleviate discomfort in this population.<sup>15</sup>

The study conducted in Kolhapur, focusing on non-specific upper back pain among professional city bus drivers aged 30-45, found that out of a total of 96 male participants, 36 reported experiencing such pain. This yields a prevalence rate of 37% for non-specific upper back pain among professional city bus drivers in the area.

Maintaining proper posture is crucial for bus drivers to avoid discomfort and potential long-term health issues. They can mitigate these problems by incorporating regular breaks, stretching exercises, and ergonomic adjustments to their seats and driving position. Additionally, providing education on proper

posture and ergonomic practices can greatly benefit bus drivers' overall well-being.<sup>11</sup>

#### IV. CONCLUSION

The present study concluded that the prevalence of non-specific upper back in city bus drivers is 37 % and mostly seen in the participants with age group of 41-45years.

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