

IMPACT OF PROLONGED WORKING HOURS ON NON SPECIFIC NECK PAIN AND ASSOCIATED DISABILITY AMONG BUS RAPID TRANSIT PESHAWAR DRIVERS; A CROSS-SECTIONAL STUDY

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Abstract

Background: Neck pain, or cervicalgia, is a common musculoskeletal condition and a leading cause of disability worldwide, with a lifetime prevalence reaching up to 70%. It is particularly prevalent among individuals in physically demanding jobs, such as bus drivers, due to prolonged sitting, poor posture, and repetitive neck movements. These factors contribute to muscle fatigue, joint stress, and cervical spine dysfunction. As global populations age—especially in low- and middle-income countries—the burden of neck pain is expected to rise, impacting both individual well-being and workplace productivity.

Objective: • To find out the prevalence of non-specific neck pain among bus rapid transit drivers in Peshawar, Pakistan.

• To find out neck disability among prolonged working hours in bus rapid transit drivers.

Methodology: A cross-sectional study survey was conducted among 242 male BRT drivers aged 25 years or above. The study utilized convenience sampling, with data collected through two standardized tools: the numerical pain rating scale (NPRS) for pain assessment and Neck Disability Index (NDI) for disability measurement.

Results: The mean age of the male participants is 2.32 ± 0.573 , $N=242$. The Duration of working hours out of 242 participants 21.9% work 1-8 hours, while 52.9% work 9-12 hours and 25.2% work for 13-16 hours. Results revealed a high prevalence of neck pain among drivers, with 86.0% reporting mild pain and 9.9% experiencing moderate pain. While prevalence of neck pain among participants (86.0%) reported experiencing mild pain. Only 4.1% reported no pain, while moderate was reported by 9.9%. Neck disability among participants (71.9%) reported mild disability, while 10.3% experienced moderate disability. Only 17.8% reported no disability, while there is no severe and complete disability. The Cross-tabulation analysis showed a significant correlation between prolonged working hours, neck pain and neck disability ($p < 0.000$).

Conclusion: The findings of this study shows significant prevalence of non-specific neck pain among Bus rapid transit drivers in Peshawar. And there is high

INTRODUCTION

Neck pain (cervicalgia) is common and can cause disability. It affects over 30% of people yearly. Though often self-limiting, about 50% have ongoing pain. Evaluation helps rule out serious causes like myelopathy or cancer (1). Neck pain is a common work-related issue, driven by physical and psychosocial factors. Its impact is rising, especially in aging populations of low- and middle-income countries (2). Bus driving is an example of a highly strenuous occupation, with high risks of physical and mental occupational ill-health, leading to absenteeism and decreased productivity of employees and enterprises (3). Bus drivers are one of the largest groups in the transport sector, often working long hours. According to the US Bureau of Labor Statistics (2017), they are among the top three occupations with the highest rates of musculoskeletal disorders (4). The cervical spine (C1-C7) supports neck movement and stability. Vertebrae, discs, muscles, ligaments, and nerves work together—discs absorb shock, muscles maintain posture, and facet joints stabilize motion (5).

BRT drivers are at high risk for neck pain due to long hours of static posture, repetitive movements, and poor ergonomics. Prolonged sitting and improper seat positioning strain neck muscles and joints, leading to fatigue, disc issues, and arthritis (6). This leads to pain, stiffness, and potentially nerve root compression, causing cervical radiculopathy, where pain radiates down the arms (7). Globally, neck pain affects a substantial portion of the population. Studies estimate that approximately 30-50% of individuals experience neck pain at some point in their lives (8). A systematic review found neck pain common in physically demanding jobs, especially among drivers and office workers. In Europe and North America, prevalence ranges from 10% to 30%, with U.S. lifetime rates reaching up to 70% (9). Similarly, in the UK and Europe, neck pain affects up to 30% of the population annually, and in Asia, its prevalence is reported to be between 6.6% and 18.7%, depending on the country and occupation (10). A cross-sectional study by T Tariq et al, in which 369 professional drivers (mean age:

40.83±9.27) found that 35% period prevalence of neck pain (n=129), 31% point prevalence (n=115) (11).

Non-specific neck pain often results from muscle strain, poor posture, and joint stress. Prolonged sitting, common in jobs like bus driving, can lead to fatigue and cervical spine issues (12). Non-specific neck pain is linked to factors like poor ergonomics, repetitive motion, lack of breaks, vehicle vibrations, and high job stress—especially in long-hour occupations (13). Personal factors such as age, gender (higher prevalence in females), and lack of physical activity also play significant roles (14). Neck pain assessment includes a detailed history and physical exam to exclude serious conditions. For non-specific cases, posture, range of motion, and cervical tenderness or spasms are key factors to evaluate (15). Special attention is given to occupational history, especially in professions like bus driving, where prolonged working hours and poor ergonomics are known contributors to neck pain (16).

Ibuprofen and naproxen are commonly prescribed to manage neck pain, as they reduce inflammation and provide symptomatic relief (13). Muscle relaxants, such as cyclobenzaprine or tizanidine, are also used when muscle spasms contribute to pain (17). In cases of severe or chronic pain, analgesics like acetaminophen may be used alone or in conjunction with NSAIDs

(18). For neuropathic pain, anticonvulsants like gabapentin or antidepressants such as amitriptyline may be effective (19). In certain cases where conservative treatment fails, local corticosteroid injections may be administered to reduce inflammation in the cervical facet joints or trigger points (20). Although not typical for non-specific neck pain, patients with coexisting degenerative changes or disc herniation's causing nerve compression may benefit from cervical decompression procedures, such as discectomy or laminectomy (21). This procedure aims to relieve pressure on spinal nerves and alleviate associated pain. In more severe degenerative cases, where there

is instability of the cervical spine, cervical fusion surgery may be performed to stabilize the vertebrae and prevent further pain (22).

Techniques such as massage, manipulation, and mobilization can help relieve muscle tension and improve joint function in the cervical spine (23). Manual therapy is especially beneficial when combined with exercise therapy. Stretching and strengthening exercises targeting the neck and shoulder muscles are essential in managing non-specific neck pain. Specific exercises, like chin tucks, neck stretches, and scapular stabilization exercises, can help improve posture and reduce muscle strain (24). Bus drivers benefit from these exercises as they counteract the prolonged static postures of their job. Ergonomic adjustments, such as seat modifications and steering wheel adjustments, can help drivers maintain a more neutral spine during long hours of work (12). In some cases, mechanical or manual cervical traction may be used to reduce pressure on the cervical spine, particularly in drivers who experience radicular symptoms due to nerve root irritation (15). Post-surgical care is key to recovery and preventing neck pain recurrence. Physical therapy helps restore movement, build strength, and improve posture. Drivers should adjust ergonomics—like seat and mirrors—and take regular breaks. Early activity and pain control with NSAIDs, muscle relaxants, or TENS can support recovery (25).

Although according to some literature studies neck pain, especially non-specific neck pain, is prevalent among individuals who are subjected to static sitting and repetitive strains. Bus rapid Transit drivers spend prolong hours behind the wheel, often in static postures, leading to muscular fatigue, poor blood circulation, and biomechanical stress on the cervical spine. This Study seeks to fulfill literature gap and examine the impact of extensive working hours on the frequency and severity of non-specific neck pain and disability among Bus Rapid Transit Peshawar drivers.

METHODS AND MATERIALS:

This study adopts a cross-sectional survey design to determine the prevalence of non-specific neck pain among Bus Rapid Transit (BRT) drivers in Peshawar, Pakistan. The research was conducted at the Bus Rapid Transit (BRT) depot stations in

Peshawar, Pakistan. These depots serve as the central gathering points for BRT drivers, making them ideal locations for data collection. The sample size was 242 participants with confidence interval at 95%. The sample size was calculated using sample size calculator i.e Raosoft . Sampling technique used was non- probability convenience sampling. The study was completed within six months after approval of proposal by research committee. The inclusion criteria for this study were as follows: Male BRT drivers aged 25 years or older, minimum of 1 year of professional bus driving experience, permanent employment with the BRT Company, standard full-time working hours (minimum 36 hours per week) and driving distances of 70-100 km or more per day while excluding drivers with a history of traumatic injuries such as blunt trauma, penetrating trauma, or recent cervical surgery and drivers diagnosed with systemic diseases including Rheumatoid arthritis, Osteoarthritis, Ankylosing spondylitis, or cervical cancer. Data was collected using a self- structured demographic questionnaire, Neck Disability Index (NDI) and Numeric Pain Rating Scale (NPRS). The data was analyzed using SPSS version 25. The analysis includes the following steps:

- Descriptive Statistics: Demographic data and participant characteristics were summarized using frequencies and percentages for categorical variables, while means and standard deviations was reported for numerical variables
- Chi-Square Test: The association between prolonged working hours and neck pain with disability was analyzed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant, indicating a meaningful relationship between the variables.

RESULTS:

The mean age of the male participants is $2.32 \pm .573$, $N=242$. The Duration of working hours out of 242 participants 21.9% work 1-8 hours, while 52.9% work 9-12 hours and 25.2% work for 13- 16 hours. Results revealed a high prevalence of neck pain among drivers, with 86.0% reporting mild pain and 9.9% experiencing moderate pain. While prevalence of neck pain among participants (86.0%) reported experiencing mild pain. Only 4.1% reported no pain, while moderate was reported by 9.9%. Neck

disability among participants (71.9%) reported mild disability, while 10.3% experienced moderate disability. Only 17.8% reported no disability, while there is no severe and complete disability. The Cross-tabulation analysis showed a significant correlation between prolonged working hours, neck pain and neck disability (p 0.000).

SECTION 1: DEMOGRAPHIC CHARACTERISTICS:

A total of N= 242 participants took place in the study, all of whom were male (100%). The majority of participants 66.5% (n=161) are into the <40 age group, followed by the <50 age group 28.1% (n=68). The <30 age group comprised 2.1% (n=5) of the sample. The final 3.3% (n=8) of participants were aged <60. The most of participants 76.9%(n=186) reported being married, followed by those who identified as single 21.9 (n=53). The proportion of

divorced individuals was 1.2% (n=3). The majority 87.6% (n=219) reported having been employed for less than 5 years. A smaller portion of participants 9.6% (n=24) they had been employed for 6-10 years, while only 7 participants 2.8%(n=7) reported being employed for more than 10 years. The results identify that out of 242 participants, a significant majority 83.6% (n=200) reported having previously worked as drivers, while a smaller portion 16.4% (n=42) identify they had held other types of jobs. Duration of working hours' analysis shows that out of 242 participants 21.9% (n=53) work 1-8 hours, while 52.9% (n=128) work 9-12 hours and 25.2% (n=61) work for 13-16 hours. As shown in Table 1, the majority of trips 49.2% (n=119) lasted more than 30 minutes, while 34.7% (n=84) of trips were less than 20 minutes, and 16.1% (n=39) fell within the 20 to 30-minute range.

Table-1: Demographic characteristics of the participants

DEMOGRAPHICS				
Category	Percentage %	Attribute	Frequency	Mean + St deviation
AGE	<30	5	2.1	2.32+.573
	<40	161	66.5	
	<50	68	28.1	
	<60	8	3.3	
	Total	242	100.0	
Marital status	Single	53	21.9	1.7+.435
	Married	186	76.9	
	Divorce	3	1.2	
	Total	242	100.0	
Duration of Employment	<5 years	219	87.6	1.15+4.37
	6-10 years	24	9.6	
	>10 years	7	2.8	
	Total	242	100.0	
Types of Previous Job	Driver	200	83.6	1.18+.397
	Others	42	16.4	
	Total	242	100.0	
Duration of Working hours per day	1-8 hours	53	21.9	2.14+.686
	9-12 hours	128	52.9	
	13-16 hours	61	25.2	
	Total	242	100.0	
Duration of each Trips	<20 Minutes	84	34.7	2.14+.900
	>20-30 Minutes	39	16.1	
	>30 Minutes	119	49.2	

	Total	242	100.0
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SECTION 2: PREVALENCE OF NECK PAIN:

As shown in Table 2, the majority of participants (86.0%) reported experiencing mild pain. Only 4.1% reported no pain, while moderate was reported

by 9.9% of participants, respectively. The cumulative percentages indicate that 90.1% of the sample reported mild or greater pain, highlighting the significant prevalence of pain in this population.

Table 2: Frequency and Valid Percentage of Neck Pain through NPRS

NPRS			
Pain	Frequency	Percent	Valid Percent
No pain	10	4.1	4.1
Mild Pain	208	86.0	86.0
Moderate Pain	24	9.9	9.9
Severe Pain	0	0	0
Total	242	100.0	100.0

SECTION 3: DISABILITY SCORE AMONG DRIVERS:

As shown in Table 3, a significant majority of participants (71.9%) reported mild disability, while

10.3% experienced moderate disability. Only 17.8% reported no disability, while there is no severe and complete disability.

Table 3. Frequency, percentage of Disability among the participants

DISABILITY			
NDI Disability	Frequency	Percent	Valid Percent
No Disability	43	17.8	17.8
Mild Disability	174	71.9	71.9
Moderate Disability	25	10.3	10.3
Severe Disability	0	0	0
Complete Disability	0	0	0
Total	242	100.0	100.0

❖ **CROSSTABLES:**

1. **DURATION OF WORKING HOURS PER DAY * NDI:**

Table 4. Chi square test for Duration of Working hours per day * NDI

Duration of Working hours per day * NDI Cross tabulation					
Working hours	NDI				
	No Disability	Mild Disability	Moderate Disability	Severe Disability	Complete Disability
1-8 hours	43	10	0	0	0
9-12 hours	0	126	2	0	0
13-16 hours	0	38	23	0	0
Total	43	174	25	0	0

2. **DURATION OF WORKING HOURS PER DAY * PAIN SCORE (NPRS):**

Duration of Working hours per day * Pain Score Cross tabulation			
Working hours	NPRS		
	No pain	Mild pain	Moderate pain
1-8 hours	6	47	0
9-12 hours	4	118	6

13-16 hours	0	43	18
Total	10	208	24
P value	0.000		

Table 5. Chi square test for Duration of Working hours per day * NPRS

Cross tabulation and Chi square test of NPRS, NDI with working hours' association. Cross tabs result show that there is high significant association of working hours with neck pain and disability among bus drivers of BRT Peshawar. Whereas P VALUE for neck pain is 0.000 and for disability is 0.000.

DISCUSSION:

This study investigated the impact of prolonged working hours on the prevalence of non-specific neck pain and associated disability among Bus Rapid Transit (BRT) drivers in Peshawar, Pakistan. A total of 242 participants took place in the study, all of whom are male (100%), most of whom were under 40 years old (66.5%).

The results of the study revealed critical insight into the correlation between long-lasting work hours, neck pain, and its impact on the driver professional and personal lives. The result indicated that most of the participants reported some level of neck pain, with 86.0% experiencing mild pain, followed by 10.3% reporting moderate pain and 0.8% suffering from severe pain. This prevalence of mild and moderate neck pain among BRT drivers is same with findings from a study conducted by Robb and Mansfield (2007) on truck drivers in UK, which reported that 55% of drivers undergo musculoskeletal pain, particularly in the neck, due to the long hours of static position and exposure to vibration, the UK study emphasize that the long driving hours, similar to our findings in Peshawar, contribute to chronic neck pain.

Moreover, the overall prevalence of neck pain in this study (ranging from mild to severe) similar the study by Ariens et al. (2001), in which they examined neck pain among workers in different occupation, including professional drivers. They found that up to 45% of drivers reported some level of neck pain, due to prolonged sitting, poor posture, and limited breaks contributing to these results. The results of Ariens is related to our findings where 49.2% of trips lasted more than 30 minutes, limiting driver

movement and resulting in increased musculoskeletal injuries (26).

The findings of this study show a significant musculoskeletal burden among drivers. A relevant comparison can be made with a similar study conducted on long-route bus drivers in Peshawar, which focused on non-specific low back pain. Both highlight the exposure of drivers to musculoskeletal disorders, due to prolonged sitting, awkward posture and long working hours being key element. In our study, 86% of drivers of drivers experiencing some level of neck pain, whereas bazmeer afridi et al. (2023) also revealed a high prevalence of low back pain due to extended driving hours and lack of rest breaks, supporting our findings that extended period of driving play a vital role in musculoskeletal health issues. In term of disability our study found that most drivers reported mild to severe neck pain, this is similar with known back pain findings, in which long-route bus drivers similarly reported a decrease in work capacity and increased problems over time. Comparatively, the neck prevalence in our BRT driver population show slightly lower than low back pain prevalence among long-route drivers, due to difference in driving conditions, route length, and vehicle ergonomics (27).

Further, the high incidence of neck pain associated disability found in our study is related to the findings of Bener et al. (2010), in which they studied professional's drivers in Qatar. In which 35% of drivers stated musculoskeletal disorders, including neck pain, mostly attributed to prolonged working hours and inadequate body mechanics. In our sample 51.2% Of participants did not experience awkward posture during driving, but some experience forward bending or extension was frequently associated with pain. This also pointed that any postural deviations, static postures and extended driving time contribute to the onset of non-specific neck pain (28).

The relation between prolonged working hours and neck disability, in our study 96.7% of participants experienced mild to moderate disability, with severe

and complete disabilities being rare. Also a study by [Apirati Kasemsan et al \(2021\)](#), show mild to moderate disability in which the prevalence in the neck was 42.4%. But many drivers continued working despite their discomfort, raising concerns about driver safety and well-being. Both studies highlight mild to moderate disability but did not show significance with prolong working hours.(4)

The relation between prolonged working hours and neck pain is well documented in the literature. Our study found that 49.2% of driving trips lasted and more than 30 minutes, which supports the finding of Szeto and Lam (2007), who reported that taxi drivers in Hong Kong experienced higher degrees of neck pain due to prolonged driving hours. Both studies highlight the risk factors related with prolonged static posture and lack of movement during long shifts (29).

CONCLUSION:

The findings of this study highlight the significant prevalence 86.0% of non-specific neck pain with most of the drivers reporting, ranging from mild to moderate. While there is high significant association of working hours on neck pain and disability among Bus rapid transit drivers in Peshawar.

LIMITATIONS:

As the study captures data at one point in time, it cannot establish causality meaning it can show associations but not determine if long working hours directly cause neck pain. Self-reported measures may be subject to bias, as drivers might underreport or over report their pain and disability levels. Other factors, such as lifestyle, pre-existing medical conditions, or psychosocial stressors, may influence pain and disability but could be challenging to control for in the analysis. The study may not account for changes in working conditions or practices over time, which could impact the prevalence and experience of pain.

RECOMMENDATIONS:

This study reveals that prolonged working hour's impact on neck pain and disability among bus BRT bus drivers of Peshawar. Furthermore, longitudinal studies needed to help establish causation and better inform interventions aimed at reducing neck pain

and disability in this population. And others factors like ergonomics, job satisfaction and mental health association with neck pain and disability among bus drivers. Future research needed to examine neck pain prevalence across different transportation system with focus groups to gain insights into driver's personal experiences with pain and coping strategies.

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