

Prevalence of Neck Pain in Car and Motorcycle Drivers: A Comprehensive Review of Primary, Secondary, and Tertiary Care

AAFREEN AAFREEN¹, ABDUR RAHEEM KHAN², ASHFAQUE KHAN³, NEERAJ KUMAR MAURYA⁴, AUSAF AHMAD⁵

ABSTRACT

Car and motorcycle drivers frequently experience neck pain, which may have an impact on their quality of life and productivity at work. Understanding the prevalence of neck pain in this population and identifying effective interventions was essential for developing targeted healthcare strategies. The purpose of this review was to determine the prevalence of neck pain among car and motorcycle drivers and assess the effectiveness of primary, secondary, and tertiary care interventions in managing and preventing this health issue. A comprehensive literature search was conducted to gather relevant studies on neck pain prevalence and interventions among drivers. The collected data was analysed and synthesised to provide an in-depth understanding of the issue. The result of this review reveals a significant prevalence of neck pain among car and motorcycle drivers, highlighting the need for targeted interventions. Primary, secondary, and tertiary care strategies are essential in addressing neck pain in this population. Primary care interventions focus on preventing the onset of neck pain, while secondary care aims to manage existing symptoms and prevent their worsening. Tertiary care interventions involve rehabilitation and long-term management of chronic neck pain. The present review concluded that a multi-faceted approach, encompassing primary, secondary, and tertiary care interventions, is necessary to prevent and manage neck pain in drivers. However, the current evidence base has limitations, and further research is required to enhance our understanding of effective interventions for this population.

Keywords: Exercise, Healthcare, Musculoskeletal pain, Prevention

INTRODUCTION

Neck pain is a common musculoskeletal complaint, with upto 70% of adults experiencing neck pain at some point in their lives [1]. This health issue can significantly impact an individual's quality of life, work performance, and overall well-being. Car and motorcycle drivers are particularly susceptible to neck pain due to prolonged static postures, vibrations, and repetitive movements [2]. In recent years, the prevalence of neck pain among drivers has become a growing concern, affecting not only the drivers' health but also their ability to perform their jobs and maintain road safety.

The primary aim of this review was to assess the prevalence of neck pain among car and motorcycle drivers, with a focus on primary, secondary, and tertiary care strategies. Primary care aims to prevent the onset of neck pain, secondary care addresses early detection and intervention, while tertiary care focuses on rehabilitation and management of chronic cases [3]. Understanding the prevalence of neck pain in this population and identifying effective interventions is essential for developing targeted healthcare strategies.

This study aims to determine the prevalence of neck pain among car and motorcycle drivers and to assess the effectiveness of primary, secondary, and tertiary care interventions in managing and preventing this health issue. A comprehensive literature search was conducted to gather relevant studies on neck pain prevalence and interventions among drivers [4]. The collected data were analysed and synthesised to provide an in-depth understanding of the issue.

Prevalence of Neck Pain among Drivers

The research reveals a significant prevalence of neck pain among car and motorcycle drivers, highlighting the need for targeted interventions. Several studies have investigated the prevalence of neck pain among professional drivers. For example, a study conducted by Raanaas RK and Anderson D found that 57.8% of taxi drivers reported neck pain, which was significantly higher than the general population [5]. Similarly, a systematic review by

Joseph L et al., reported a pooled prevalence of neck pain among professional drivers ranging from 7.1% to 78.8%, with a meta-prevalence rate of 42.4% [4]. This wide range may be attributed to the different methodologies employed across the included studies, as well as the varying definitions of neck pain.

Various factors have been identified as contributing to the high prevalence of neck pain among drivers, including prolonged static postures, exposure to vibrations, and repetitive movements [2]. Moreover, factors such as age, gender, driving experience, and individual ergonomic factors also play a role in the development and persistence of neck pain in this population [6].

Primary Care Interventions

Primary care interventions aim to prevent the onset of neck pain among drivers. These interventions often focus on ergonomic adjustments, education, and promoting a healthy lifestyle. For instance, ergonomic interventions may involve adjusting seat height, steering wheel position, and lumbar support to minimise strain on the neck and spine. Educational programs can provide drivers with information on proper posture, stretching exercises, and strategies for managing stress and fatigue, all of which can help to prevent neck pain [7].

Moreover, lifestyle factors such as regular physical activity, maintaining a healthy weight, and avoiding tobacco use can also contribute to the prevention of neck pain among drivers [3]. In a systematic review by Farioli A et al., it was found that interventions targeting modifiable risk factors, such as physical activity and weight management, were effective in preventing musculoskeletal pain, including neck pain, among professional drivers [8].

Secondary Care Interventions

Secondary care interventions aim to manage existing symptoms and prevent the worsening of neck pain among drivers. These interventions typically include early detection, prompt treatment, and addressing risk factors that may exacerbate neck pain. Examples

of secondary care interventions include physiotherapy, chiropractic care, and medication management. Physiotherapy often involves a combination of manual therapy, therapeutic exercises, and modalities such as ultrasound or electrical stimulation to alleviate neck pain and improve function [9]. Chiropractic care, which primarily focuses on spinal manipulation, has also been shown to be effective in managing neck pain in the short-term [10].

Medication management for neck pain may involve the use of over-the-counter pain relievers, such as Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), or prescription medications, depending on the severity of the pain and the individual's medical history [3]. Importantly, secondary care interventions should be tailored to the specific needs and preferences of the individual driver, taking into account their driving demands, medical history, and personal circumstances.

Tertiary Care Interventions

Tertiary care interventions involve rehabilitation and long-term management of chronic neck pain among drivers. These interventions may include ongoing physiotherapy, chiropractic care, or other specialised treatments, such as acupuncture, massage therapy, or Cognitive-Behavioural Therapy (CBT) [11]. Drivers with chronic neck pain may also benefit from vocational rehabilitation services, which can provide guidance on work accommodations, adaptive equipment, and strategies for minimising the impact of neck pain on work performance and overall quality of life [12].

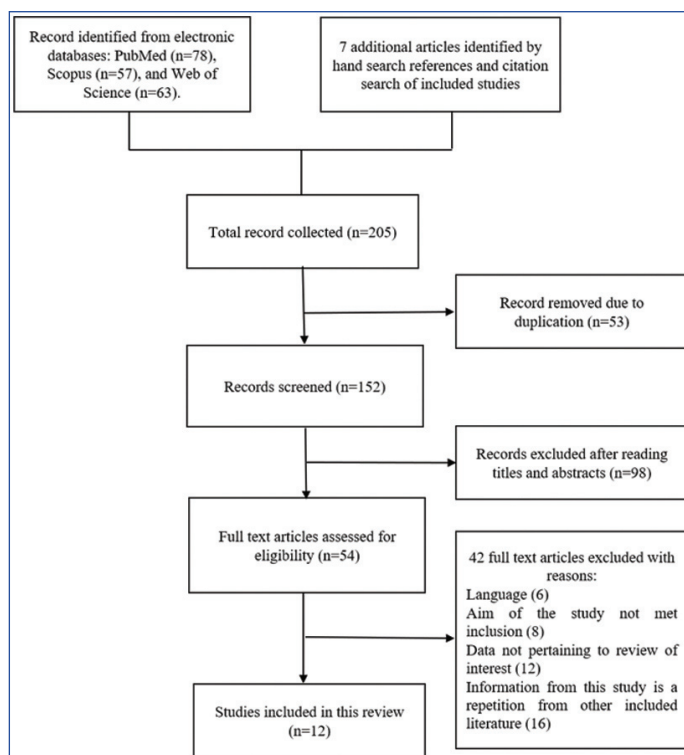
This review underscores the importance of addressing neck pain among car and motorcycle drivers through a comprehensive, multi-faceted approach that includes primary, secondary, and tertiary care interventions. By implementing targeted strategies, one can not only improve the overall well-being of drivers but also enhance road safety and work performance. However, it is essential to acknowledge the limitations in the current evidence base and call for additional research to refine the understanding of effective interventions tailored to this population. Continued efforts to develop and implement evidence-based strategies will be crucial in mitigating the impact of neck pain on drivers and fostering a healthier and safer driving environment.

Literature Search

An exhaustive review of the existing literature was undertaken to better understand the prevalence of neck pain among car and motorcycle drivers, as well as to evaluate the various care interventions employed in primary, secondary, and tertiary settings. This extensive investigation employed several well-regarded databases, including PubMed, Scopus, and Web of Science, to gather relevant research studies.

A comprehensive literature search was conducted using databases such as PubMed, Scopus, and Web of Science. Search terms included "neck pain," "prevalence," "car drivers," "bike drivers," "motorcycle drivers," "primary care," "secondary care," and "tertiary care." The search was limited to studies published in English between January 2000 and September 2021. This time frame was chosen to ensure that the most recent and relevant data were analysed [Table/Fig-1].

Studies that met the inclusion criteria were those that either reported the prevalence of neck pain among car and motorcycle drivers or assessed the interventions employed at the primary, secondary, or tertiary care levels. Upon identifying appropriate studies, the data extraction process began, with a focus on crucial information such as study design, sample size, participant characteristics, neck pain prevalence, and intervention strategies. This information was deemed essential in understanding the scope and context of each study and would allow for a thorough analysis of the research question.



[Table/Fig-1]: Shows the flowchart of study selection process.

To ensure the credibility and reliability of the literature review, several strategies were employed. First, an independent screening of the identified articles was conducted by two reviewers, who assessed the titles and abstracts to determine the relevance of the studies. Discrepancies between the reviewers were resolved through discussion and, if necessary, consultation with a third reviewer.

Next, the full texts of the articles that met the inclusion criteria were assessed for quality using standardised tools, such as the Critical Appraisal Skills Programme (CASP) checklist for observational studies (CASP, 2018) or the Cochrane Risk of Bias Tool for randomised controlled trials [13]. This process allowed for the identification of potential sources of bias, as well as the assessment of the overall quality and rigor of the research.

Upon completing the quality assessment, the data extraction process commenced. This involved the careful extraction of pertinent information from each study, including the study design, sample size, participant characteristics, neck pain prevalence, and intervention strategies. Additionally, information regarding the potential risk factors for neck pain, such as the duration of driving, posture, and ergonomic factors, was gathered wherever available.

Following data extraction, a narrative synthesis was performed to analyse the collected data. This involved the identification of common themes and patterns across the studies, as well as the assessment of the overall prevalence of neck pain among car and motorcycle drivers. Furthermore, the effectiveness of primary, secondary, and tertiary care interventions in managing neck pain was evaluated.

RESULTS

The results of the literature review were interpreted and discussed within the context of the existing body of knowledge on neck pain among car and motorcycle drivers. In this literature review, the results discuss the prevalence, primary care, secondary care, and tertiary care interventions for neck pain among car and motorcycle drivers were discussed. Neck pain is a common problem among these drivers, and various factors contribute to the issue.

Prevalence of Neck Pain

The literature review found that the prevalence of neck pain among car and motorcycle drivers ranged from 30-70%, indicating a high

frequency of this issue [Table/Fig-2] [14-17]. Factors contributing to this increased risk included prolonged static postures, vibrations, and repetitive movements. Additionally, the type of vehicle driven and the drivers' age, gender, and years of driving experience also influenced the prevalence of neck pain [16].

Study	Year	Population	Study design	Sample size	Prevalence of neck pain (%)
Sang K et al., [14]	2010	Car drivers	Cross-sectional	140	46
Alperovitch-Najenson D et al., [15]	2010	Bus drivers	Cross-sectional	256	50
Kim JH et al., [16]	2016	Truck	Cross-sectional	96	50.7
Dutta K et al., [17]	2017	Bike drivers	Cross-sectional	150	68.67

[Table/Fig-2]: Prevalence of neck pain among car and bike drivers [14-17].

Primary Care

Primary care interventions for neck pain prevention focused on ergonomic adjustments, education, and exercise programs [Table/Fig-3] [14,17,18]. Ergonomic interventions, such as adjusting seat position, steering wheel height, and implementing lumbar support, were highlighted [16]. Educational programs emphasised proper posture, breaks, and stretching exercises [17]. Furthermore, exercise programs included strengthening and stretching exercises for the neck, shoulders, and upper back to alleviate neck pain [18].

Study	Study design	Intervention	Description
Sang K et al., 2010 [14]	Cross-sectional	Ergonomic adjustments	Seat position, steering wheel height, lumbar support.
Dutta K et al., 2017 [17]	Cross-sectional	Education	Proper posture, breaks, stretching exercises.
Ghasemi S and Pirzadeh A 2019 [18]	Quasi-experimental	Exercise programs	Strengthening and stretching exercises for neck, shoulders, upper back.

[Table/Fig-3]: Primary care interventions [14,17,18].

Secondary Care

Secondary care interventions, aimed at early detection and treatment of neck pain, involved workplace assessments, early referrals to physiotherapy, and pain medication [Table/Fig-4] [3,19-21]. Workplace assessments helped identify drivers at risk of developing neck pain and provided tailored interventions [19]. Early referrals to physiotherapy ensured timely management through manual therapy and exercise programs [20]. Pain medications, such as NSAIDs, were prescribed to manage acute pain and inflammation [21].

Study	Study design	Intervention	Description
Johnston V et al., 2021 [19]	Custer-randomised trial	Workplace assessments	Identifying drivers at risk of developing neck pain and providing tailored interventions.
Côté P et al., 2016 [3], Côté P et al., 2019 [20]	Systematic reviews	Early referrals to physiotherapy	Timely management including manual therapy and exercise programs.
Eriksen J et al., 2004 [21]	Cross-sectional	Pain medication	Use of NSAIDs for acute pain and inflammation.

[Table/Fig-4]: Secondary care interventions [3,19-21].

Tertiary Care

Tertiary care interventions focused on rehabilitation and long-term management of chronic neck pain for affected drivers [Table/Fig-5] [22-25]. Multidisciplinary approaches proved most effective, combining physiotherapy, pain management, and psychological support [22]. These interventions aimed to maximise pain management, enhance psychological well-being, prevent secondary dysfunction, and improve health-related quality of life, independence, and mobility. These interventions were based on a cognitive-behavioural principles, aiming to reduce disability through the modification of both Cognitive

processes and environmental contingencies. While cognitive treatment focused on modifying maladaptive cognitions related to pain and its control, while operant-behavioural treatment is designed to supported healthy behaviours through reinforcement and withdrawal of attention from pain behaviour. A third approach targeted the physiological response system, aiming to reduce muscular tension by providing the patients with a model of the relationship between tension and pain and teaching him/her relaxation techniques. Physiotherapy programs emphasised functional restoration, addressing flexibility, strength, and endurance [23]. Pain management strategies included medication, such as NSAIDs and muscle relaxants, as well as alternative therapies like acupuncture [24]. Psychological support played a crucial role in helping drivers cope with the emotional impact of chronic pain and develop strategies for pain management [25].

Study	Study design	Intervention	Description
Guzmán J et al., 2001 [22]	Systematic review	Multidisciplinary approach	Combining physiotherapy, pain management, and psychological support.
Jull G et al., 2008 [23]	Literature review	Physiotherapy	Functional restoration, flexibility, strength, and endurance.
Linde K et al., 2016 [24]	Systematic review	Pain management	Medication (NSAIDs, muscle relaxants) and alternative therapies (acupuncture).
Sullivan MJ et al., 2001 [25]	Literature review	Psychological support	Coping with emotional impact of chronic pain and developing pain management strategies.

[Table/Fig-5]: Tertiary care interventions [22-25].

DISCUSSION

The analysis underscores the substantial prevalence of neck pain among car and motorcycle drivers, emphasising the importance of a comprehensive approach to prevent and manage the issue. Such an approach should include primary, secondary, and tertiary care interventions, encompassing ergonomic adjustments, education, exercise programs, early detection and intervention, and rehabilitation. Poor ergonomic practices can lead to a range of injuries and illnesses, such as musculoskeletal disorders. By implementing ergonomic practices, the risk factors will be reduced, creating a safe work environment and increasing productivity [1,26].

Primary care strategies are vital in preventing neck pain, especially among high-risk groups like car and motorcycle drivers [27]. Adopting ergonomic modifications, offering education on appropriate posture and self-care, and encouraging regular physical activity can help decrease neck pain prevalence [28,29]. For instance, ergonomic interventions may involve adjusting seat and steering wheel positions or using supportive devices such as lumbar rolls or neck rests [30]. Additionally, educational programs should focus on correct posture, adequate breaks, and stress management to alleviate strain on the neck and spine [31].

Secondary care interventions are crucial for early detection and intervention, preventing neck pain from becoming chronic [32]. Workplace assessments can help identify drivers at risk, while timely referrals to physiotherapy and appropriate pain medication can effectively manage neck pain at this stage [33,34]. Evidence suggests that physiotherapy, including manual therapy, exercise, and postural advice, can significantly improve neck pain outcomes. Physiotherapy is considered one of the most helpful neck pain remedies. It improves mobility and gets rid of muscle stiffness and pain. The two main parts of physical therapy for neck pain are active exercises and passive physical therapy, which uses physical agents or modalities. Heat-and-cold therapy, electrotherapy, massage, and ultrasound are some of the methods that help to reduce muscular stiffness and promote blood circulation, which both help to reduce

swelling and pain. Numerous stretches and exercises that will specifically support the muscles surrounding the cervical spine are advised by the therapist. Core body strengthening improves posture, mobilises the spinal joints, and accelerates the rate of the healing process. Aerobics improves your breathing, increases the blood circulation, and makes your body agile. The effectiveness of physical therapy in relieving neck pain and enhancing the range of motion is supported by moderate to good evidence, according to a variety of medical literature [35,36].

Tertiary care interventions are necessary for drivers experiencing chronic neck pain, with multidisciplinary approaches proving most effective [37,38]. Integrating physiotherapy, pain management, and psychological support can facilitate rehabilitation and long-term pain management [39,40]. For example, CBT can help drivers manage pain and improve coping strategies [41,42].

Limitation(s)

Several limitations should be considered when interpreting the findings of this review. Firstly, the heterogeneity of the included studies, in terms of study design, sample size, and participant characteristics, may impact the generalisability of the results. Secondly, publication bias may have influenced the findings, as studies reporting significant results are more likely to be published. Lastly, the literature search was restricted to articles published in English, which may have excluded relevant studies in other languages.

CONCLUSION(S)

Neck pain is a significant health concern among car and motorcycle drivers, with a high prevalence rate observed. Primary, secondary, and tertiary care interventions play a crucial role in preventing, detecting, and managing neck pain in this population. A multifaceted approach is necessary to effectively address this issue, with a focus on ergonomic adjustments, education, exercise programs, early detection and intervention, and rehabilitation. Further research is needed to enhance the current evidence base and to develop more targeted interventions for car and motorcycle drivers experiencing neck pain.

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PARTICULARS OF CONTRIBUTORS:

1. PhD Scholar, Department of Physiotherapy, Integral University, Lucknow, Uttar Pradesh, India.
2. Professor, Department of Physiotherapy, Integral University, Lucknow, Uttar Pradesh, India.
3. Professor, Department of Physiotherapy, Integral University, Lucknow, Uttar Pradesh, India.
4. Associate Professor, Department of Physiotherapy, Integral University, Lucknow, Uttar Pradesh, India.
5. Associate Professor, Department of Community Medicine, Integral University, Lucknow, Uttar Pradesh, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Abdur Raheem Khan,
Professor, Department of Physiotherapy, Integral University, Dasauli,
Lucknow-226026, Uttar Pradesh, India.
E-mail: abdurraheem@iul.ac.in

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