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Original Article

Impact of Driving Habits and Biomechanical Factors on Cervicogenic Headaches Among Professional Drivers

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ABSTRACT

Background: Professional drivers are exposed to prolonged sitting, constrained cervical posture, repeated jerky movements, and vehicle-related vibration, which may contribute to neck pain and cervicogenic headache. Evidence remains limited regarding the association of driving habits and biomechanical symptoms with cervicogenic headache among professional drivers. Objective: To determine the prevalence of cervicogenic headache and examine its association with driving habits and biomechanical factors among professional drivers. Methods: This cross-sectional observational study included 104 professional drivers recruited through non-probability convenience sampling. Data were collected using self-reported questionnaires, physical assessment, and observational evaluation of driving-related factors. Variables included age, sex, driving experience, vehicle type, pain intensity, history of jerky trauma, seat adjustment, perceived vibration area, and neck and shoulder muscle symptoms. Data were analyzed using SPSS version 26.0. Frequencies, percentages, mean, and standard deviation were calculated, and associations were examined using chi-square testing, with $p<0.05$ considered statistically significant. Results: The mean age was 41.08 ± 17.46 years, and 81 participants (77.9%) were male. Cervicogenic headache was present in 49 drivers (47.1%). Significant associations were observed with driving experience, vehicle type, jerky trauma, perceived vibration area, aching, fatigue, and twitching of neck and shoulder muscles ($p<0.05$). Seat adjustment was not associated with cervicogenic headache. Conclusion: Cervicogenic headache was common among professional drivers and was associated with selected driving-related and biomechanical symptom variables. Findings should be interpreted as unadjusted cross-sectional associations. Keywords: Cervicogenic headache; Neck pain; Professional drivers; Driving habits; Biomechanical factors; Whole-body vibration.

EDITORIAL INFORMATION

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INTRODUCTION

Neck pain and cervicogenic headache are common musculoskeletal and neurophysiological complaints that can substantially affect occupational functioning, concentration, sleep quality, and daily activities. The cervical spine provides mobility and postural support for the head through coordinated activity of vertebrae, intervertebral discs, muscles, ligaments, and neural structures; however, prolonged static loading, repetitive micro-movements, poor ergonomic positioning, and sustained muscle activation can disturb this functional balance and contribute to pain and headache symptoms originating from the cervical region (1). Cervical proprioceptive dysfunction, reduced range of motion, impaired muscular endurance, and altered postural control have been described as clinically relevant mechanisms in individuals with neck pain, supporting the need to evaluate both symptomatic and biomechanical features when examining cervicogenic headache in occupational groups (1).

Neck pain is a major occupational health concern and has been associated with prolonged sitting, awkward postures, repetitive work demands, and inadequate ergonomic conditions in working populations (2,3). Cervicogenic headache is a secondary headache disorder in which pain is attributed to cervical spine dysfunction and is commonly associated with restricted neck movement, neck tenderness, and provocation of symptoms by neck posture or movement (4). Although cervicogenic headache is clinically distinct from migraine, it can present with head pain that originates in the neck and may be accompanied by overlapping symptoms, making accurate terminology and operational definition important in research and clinical practice (4).

Professional drivers represent a particularly vulnerable occupational group because they are exposed to prolonged sitting, constrained cervical and trunk postures, repeated acceleration and braking, whole-body vibration, limited opportunities for active movement, and variable vehicle ergonomics. Previous studies have reported a high burden of musculoskeletal pain among professional drivers, including bus drivers and other driving-related occupational groups, suggesting that driving exposure may contribute to cervical discomfort and functional limitation (5,6). In addition to driving duration and years of experience, factors such as vehicle type, seat position, steering posture, vibration exposure, and sudden jerky movements may influence cervical loading patterns and symptom development. Pre-existing cervical conditions, postural deviations, and cervical muscle fatigue may further increase susceptibility to neck pain and cervicogenic headache among drivers (7,8).

Biomechanical factors are especially relevant because cervicogenic headache is often linked to dysfunction of cervical joints, muscles, and sensorimotor control. Repeated cervical strain, vibration transmission through the seat or whole body, sustained shoulder elevation, reduced rest breaks, and prolonged forward-head or slumped posture may increase muscle tightness, aching, fatigue, and tenderness in the neck and shoulder region. These symptoms may contribute to reduced cervical mobility and may provoke headache symptoms in susceptible individuals (9,10). Clinical assessment of professional drivers should therefore consider both occupational driving habits and measurable biomechanical features, including cervical range of motion, muscle symptoms, postural alignment, and perceived vibration exposure.

Despite increasing recognition of musculoskeletal problems among drivers, evidence remains limited regarding the combined association of driving habits and biomechanical factors with cervicogenic headache among professional drivers in local occupational settings. Previous research has commonly focused on general neck pain, disability, helmet use, or musculoskeletal symptoms, while fewer studies have specifically examined cervicogenic headache as a distinct outcome in relation to driving experience, vehicle type, jerky trauma, vibration exposure, rest-break patterns, and cervical muscle symptoms. This gap is important because identifying modifiable occupational and biomechanical correlates may guide preventive strategies such as ergonomic assessment, driver education, posture correction, structured rest breaks, and targeted exercise programs (11-14).

Therefore, this study aimed to determine the prevalence of cervicogenic headache and examine its association with driving habits and biomechanical factors among professional drivers. The study specifically evaluated whether driving experience, type of vehicle, history of jerky trauma while driving, perceived vibration area, rest-break duration, postural alignment, and neck and shoulder muscle symptoms were associated with the presence of cervicogenic headache among professional drivers.

MATERIAL AND METHODS

This study was conducted as a cross-sectional observational study to examine the prevalence of cervicogenic headache and its association with driving habits and biomechanical factors among professional drivers. A cross-sectional design was appropriate because the purpose was to assess the distribution of cervicogenic headache and explore associations between occupational driving-related exposures and biomechanical characteristics at a single point in time, without inferring causality. Data were collected from professional drivers recruited from transportation hubs, logistics-related locations, trucking associations, and other driver-accessible occupational settings in an urban region with a high

concentration of professional drivers. The study was completed over a six-month period after approval of the research proposal by the Institutional Review Board of the University of Lahore.

Participants were selected using a non-probability convenience sampling technique. Professional drivers were screened for eligibility before enrollment. Drivers of either sex were eligible if they were aged above 18 years, had at least one year of continuous professional driving experience, drove any type of vehicle professionally, drove for a minimum of two hours per day, and reported neck pain intensity of at least 4 on the Numeric Pain Rating Scale. Drivers were excluded if they had a history of severe head or neck injury, diagnosed neurological disorder, tumor of the cervical spine or adjacent region, or were currently receiving treatment for chronic pain conditions unrelated to driving. Eligible participants were informed about the study purpose and procedures, and written informed consent was obtained before data collection.

The sample size was calculated using Epitool, and 104 professional drivers were included in the final analysis. The sampling frame was intended to capture drivers with different occupational exposures, including variation in years of driving experience, vehicle type, daily driving pattern, and ergonomic conditions. Data collection was performed using a combination of self-reported questionnaire-based assessment, physical examination, and observational evaluation. The questionnaire recorded demographic and occupational information, including age, sex, years of professional driving experience, type of vehicle driven, driving-related neck pain characteristics, history of sudden jerky trauma while driving, seat adjustment practices, perceived area of vibration during driving, duration of rest breaks, and symptoms involving the neck and shoulder muscles.

The primary outcome variable was the presence of cervicogenic headache among professional drivers. Cervicogenic headache status was classified as present or absent based on participant-reported headache symptoms related to the cervical region and clinical features assessed during data collection. Neck pain intensity was recorded using the Numeric Pain Rating Scale and categorized into no pain, mild pain, moderate pain, and severe pain according to the study data structure. Driving habits were assessed through variables including driving experience, vehicle type, history of jerky trauma while driving, seat adjustment during driving, and perceived vibratory area while driving. Biomechanical factors included self-reported tightness, aching, fatigue, and twitching of the neck and shoulder muscles during driving, duration of rest breaks during driving, and postural alignment based on whether the ear was aligned with the shoulder level during driving posture observation.

Physical assessment included evaluation of postural alignment, cervical movement-related complaints, and neck and shoulder muscle symptoms relevant to occupational driving exposure. Observational assessment was used to document driver posture and ergonomic characteristics during driving-related positioning, including seat adjustment and perceived vibration exposure. To improve consistency, variables were recorded using predefined response categories, and all collected data were checked for completeness before entry into the statistical software. Potential sources of bias included self-reporting of driving habits and symptoms, convenience sampling, and absence of longitudinal follow-up; therefore, interpretation was restricted to associations rather than causal effects.

Data were entered and analyzed using SPSS version 26.0. Continuous variables were summarized using mean and standard deviation, while categorical variables were summarized using frequencies and percentages. Descriptive statistics were used to present demographic characteristics, occupational driving variables, pain characteristics, and cervicogenic headache prevalence. Associations between cervicogenic headache and driving habits or biomechanical factors were examined using chi-square testing. When categorical variables contained sparse cells, exact testing or category consolidation should be considered to satisfy statistical assumptions. A p-value of less than 0.05 was considered statistically significant. Because the design was cross-sectional and the main analysis was based on unadjusted associations, findings were interpreted as associations only and not as evidence of causation, prediction, or interaction.

Ethical approval was obtained from the Research Ethics Committee and Institutional Review Board of the University of Lahore before commencement of the study. Written informed consent was obtained from all

participants. Participant confidentiality was maintained during data collection, data entry, and analysis. The dataset was reviewed for completeness and consistency before analysis to support data integrity and reproducibility.

RESULTS

A total of 104 professional drivers were included in the analysis. The mean age of participants was 41.08 ± 17.46 years. Most participants were male, comprising 81 drivers (77.9%), while 23 participants (22.1%) were female. Regarding professional driving experience, 21 drivers (20.2%) had one year of experience, 11 (10.6%) had 2–5 years, 25 (24.0%) had 6–10 years, and 47 (45.2%) had more than 10 years of driving experience. Cars were the most frequently reported vehicle type, followed by trucks, vans, auto rickshaws, bikes, and other vehicles. Mild neck pain was reported by 45 participants (43.3%), moderate pain by 41 (39.4%), severe pain by 7 (6.7%), and no pain by 11 (10.6%). Cervicogenic headache was present in 49 participants (47.1%) and absent in 55 participants (52.9%).

Table 1. Demographic, Occupational, Pain, and Cervicogenic Headache Characteristics of Professional Drivers

Variable	Category	n (%) / Mean ± SD
Age, years		41.08 ± 17.46
Sex	Male	81 (77.9)
	Female	23 (22.1)
Driving experience	1 year	21 (20.2)
	2–5 years	11 (10.6)
	6–10 years	25 (24.0)
	More than 10 years	47 (45.2)
Vehicle type	Car	37 (35.6)
	Auto rickshaw	15 (14.4)
	Bike	9 (8.7)
	Truck	25 (24.0)
	Van	16 (15.4)
	Others	2 (1.9)
Pain intensity	No pain	11 (10.6)
	Mild pain	45 (43.3)
	Moderate pain	41 (39.4)
	Severe pain	7 (6.7)
Cervicogenic headache	Absent	55 (52.9)
	Present	49 (47.1)

The cohort was predominantly male and had a relatively high proportion of experienced drivers, with 47 participants (45.2%) reporting more than 10 years of professional driving experience. Neck pain symptoms were common, with 93 participants (89.4%) reporting some degree of pain. Cervicogenic headache was present in nearly half of the sample, affecting 49 of 104 drivers (47.1%).

Driving experience showed a statistically significant association with cervicogenic headache (p=0.002). Cervicogenic headache was present in 3 of 21 drivers (14.3%) with one year of experience, 5 of 11 drivers (45.5%) with 2–5 years of experience, 11 of 25 drivers (44.0%) with 6–10 years of experience, and 30 of 47 drivers (63.8%) with more than 10 years of experience. Vehicle type was also significantly associated with cervicogenic headache (p=0.002), with the highest proportions observed among drivers of vans, auto rickshaws, trucks, and other vehicles. A history of jerky trauma while driving was significantly associated with cervicogenic headache (p=0.001), as 48 of 80 drivers (60.0%) with such history had cervicogenic headache compared with 1 of 24 drivers (4.2%) without such history. Seat adjustment while driving was not associated with cervicogenic headache (p=0.994). Perceived vibratory area while driving showed a statistically significant association with cervicogenic headache (p=0.001), with whole-body vibration reported by 48 of 49 participants with cervicogenic headache.

Among the driving-related variables, longer driving experience, vehicle type, history of jerky trauma, and perceived vibratory area were associated with cervicogenic headache. The proportion of cervicogenic headache was highest among drivers with more than 10 years of experience and among those reporting whole-body vibration during driving. Seat adjustment showed identical proportions of cervicogenic

headache in both groups, with 16 of 34 drivers (47.1%) in the seat-adjustment group and 33 of 70 drivers (47.1%) in the no-seat-adjustment group reporting cervicogenic headache.

Table 2. Association of Cervicogenic Headache with Driving Habits

Variable	Category	Total n	Cervicogenic Headache Absent n (%)	Cervicogenic Headache Present n (%)	p-value
Driving experience	1 year	21	18 (85.7)	3 (14.3)	0.002
	2–5 years	11	6 (54.5)	5 (45.5)	
	6–10 years	25	14 (56.0)	11 (44.0)	
	More than 10 years	47	17 (36.2)	30 (63.8)	
Vehicle type	Car	37	26 (70.3)	11 (29.7)	0.002
	Auto rickshaw	15	5 (33.3)	10 (66.7)	
	Bike	9	8 (88.9)	1 (11.1)	
	Truck	25	12 (48.0)	13 (52.0)	
	Van	16	4 (25.0)	12 (75.0)	
	Others	2	0 (0.0)	2 (100.0)	
History of jerky trauma while driving	Yes	80	32 (40.0)	48 (60.0)	0.001
	No	24	23 (95.8)	1 (4.2)	
Seat adjustment while driving	Yes	34	18 (52.9)	16 (47.1)	0.994
	No	70	37 (52.9)	33 (47.1)	
Most vibratory area felt while driving	Seat base	14	14 (100.0)	0 (0.0)	0.001
	Steering wheel	4	4 (100.0)	0 (0.0)	
	Backrest	4	4 (100.0)	0 (0.0)	
	Feet	5	4 (80.0)	1 (20.0)	
	Whole body	76	28 (36.8)	48 (63.2)	
	Others	1	1 (100.0)	0 (0.0)	

Percentages are row percentages. p-values were reported in the manuscript using chi-square testing.

Aching, fatigue, and twitching of the neck and shoulder muscles during driving were significantly associated with cervicogenic headache. Cervicogenic headache was reported by 32 of 38 participants (84.2%) who always experienced aching and by 29 of 40 participants (72.5%) who always experienced fatigue. Twitching showed a graded pattern across response categories, with cervicogenic headache reported by 3 of 30 participants (10.0%) who never experienced twitching, 20 of 45 (44.4%) who rarely experienced twitching, 18 of 20 (90.0%) who sometimes experienced twitching, 6 of 7 (85.7%) who often experienced twitching, and 2 of 2 (100.0%) who always experienced twitching.

Table 3. Association of Cervicogenic Headache with Internally Complete Neck and Shoulder Muscle Symptom Variables

Variable	Category	Total n	Cervicogenic Headache Absent n (%)	Cervicogenic Headache Present n (%)	p-value
Aching of neck and shoulder muscles while driving	Never	2	2 (100.0)	0 (0.0)	0.001
	Rarely	14	14 (100.0)	0 (0.0)	
	Sometimes	11	11 (100.0)	0 (0.0)	
	Often	39	22 (56.4)	17 (43.6)	
	Always	38	6 (15.8)	32 (84.2)	
Fatigue of neck and shoulder muscles while driving	Never	6	5 (83.3)	1 (16.7)	0.001
	Rarely	13	12 (92.3)	1 (7.7)	
	Sometimes	16	9 (56.3)	7 (43.8)	
	Often	29	18 (62.1)	11 (37.9)	
	Always	40	11 (27.5)	29 (72.5)	
Twitching of neck and shoulder muscles while driving	Never	30	27 (90.0)	3 (10.0)	0.001
	Rarely	45	25 (55.6)	20 (44.4)	
	Sometimes	20	2 (10.0)	18 (90.0)	
	Often	7	1 (14.3)	6 (85.7)	
	Always	2	0 (0.0)	2 (100.0)	

Percentages are row percentages. p-values were reported in the manuscript using chi-square testing.

The association pattern suggests that cervicogenic headache was more frequently reported among participants with higher-frequency neck and shoulder muscle symptoms during driving. For aching, cervicogenic headache was absent in all participants who reported never, rarely, or sometimes experiencing aching, whereas 32 of 38 participants (84.2%) who always experienced aching reported cervicogenic headache. For fatigue, the highest proportion of cervicogenic headache was observed among participants who always experienced fatigue. Twitching also showed a marked increase in cervicogenic headache frequency across higher symptom categories.

Several biomechanical variables reported in the original manuscript require data audit before publication. The tightness variable, duration of rest breaks, and posture alignment variable were not included in the final publication-ready table because the reported cross-tabulated counts were internally inconsistent with the total sample size or with the reported cervicogenic headache denominator. The tightness counts summed to 82 rather than 104 participants, the rest-break counts summed to 94 rather than 104 participants, and the posture-alignment counts produced 55 participants classified as cervicogenic headache positive despite the manuscript's main prevalence count of 49 positive cases. These variables should be recalculated from the raw dataset and reinserted only after denominator consistency is confirmed.

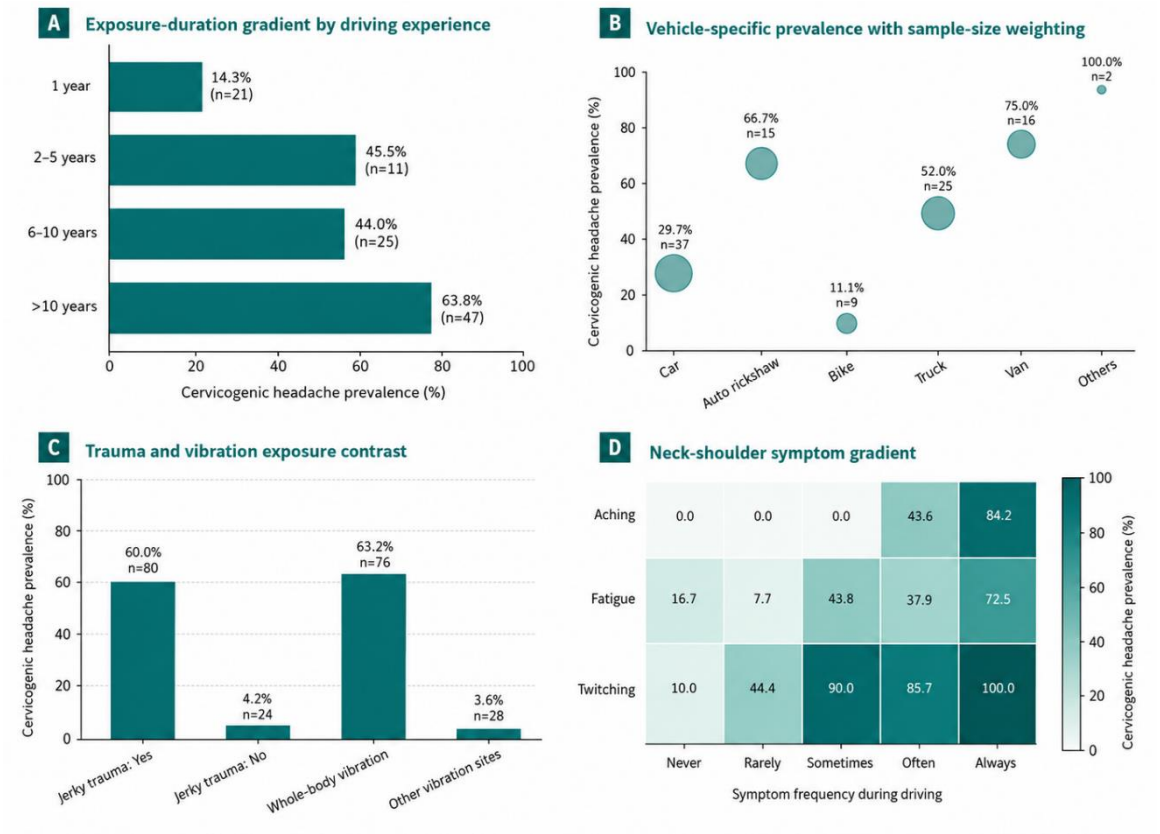

Figure 1 The panelled figure demonstrates clinically meaningful gradients in cervicogenic headache prevalence across occupational exposure and biomechanical symptom domains among professional drivers. Cervicogenic headache increased from 14.3% among drivers with one year of experience to 63.8% among those with more than 10 years of experience. Vehicle-specific patterns showed higher prevalence among van drivers, auto rickshaw drivers, and truck drivers compared with car and bike drivers, although the "Others" category contained only two participants and should be interpreted cautiously. Drivers reporting jerky trauma during driving had markedly higher cervicogenic headache prevalence than those without jerky trauma, 60.0% versus 4.2%, while whole-body vibration was associated with 63.2% prevalence compared with 3.6% across other vibration sites. Neck and shoulder symptom gradients were also evident, particularly for aching, fatigue, and twitching, with cervicogenic headache reaching 84.2% among drivers who always reported aching, 72.5% among those who always reported fatigue, and 90.0–100.0% among those reporting sometimes-to-always twitching. These findings support an exposure-symptom pattern consistent with occupational cervical loading, while remaining limited to unadjusted cross-sectional associations.

DISCUSSION

The present study found that cervicogenic headache was present in 47.1% of professional drivers, indicating a substantial burden of cervical-region headache symptoms in this occupational group. Neck pain was also common, with most participants reporting mild or moderate pain intensity. This pattern supports the clinical relevance of evaluating cervical symptoms among drivers, particularly because professional driving involves prolonged sitting, constrained posture, repetitive cervical loading, and exposure to vibration. These occupational characteristics may contribute to cervical muscle strain, reduced movement variability, and increased discomfort during or after driving (1–3,5,6). However, because the study used a cross-sectional design, the findings should be interpreted as associations rather than evidence that driving exposure directly caused cervicogenic headache.

A clear exposure-duration pattern was observed across driving experience categories. Cervicogenic headache was present in 14.3% of drivers with one year of experience, 45.5% of those with 2–5 years, 44.0% of those with 6–10 years, and 63.8% of those with more than 10 years of experience. This suggests that longer cumulative driving exposure may be related to a higher frequency of cervicogenic headache. A plausible explanation is that prolonged occupational exposure increases repeated cervical loading through static posture, recurrent vibration, and limited opportunity for movement recovery. Previous occupational health literature has similarly linked prolonged sitting, repetitive work demands, and sustained neck posture with neck and shoulder symptoms among workers and drivers (2,3,5,6,17). Nevertheless, the current analysis was unadjusted; therefore, age, daily driving duration, vehicle type, and previous musculoskeletal history may partly explain the observed association.

Vehicle type was also significantly associated with cervicogenic headache. The proportion of cervicogenic headache was higher among van drivers, auto rickshaw drivers, and truck drivers than among car and bike drivers. These differences may reflect variation in seat ergonomics, suspension quality, steering position, cabin vibration, driving duration, and road-exposure patterns across vehicle categories. Professional drivers operating larger or less ergonomically optimized vehicles may experience greater whole-body vibration and sustained postural stress. Prior research among bus drivers and other occupational driver groups has reported high musculoskeletal symptom prevalence, supporting the relevance of vehicle-related ergonomic assessment in this population (5,6,12,16). However, the “Others” vehicle category included only two drivers, so its 100% prevalence should not be overinterpreted.

A history of jerky trauma while driving showed one of the strongest observed associations with cervicogenic headache. Cervicogenic headache was reported by 60.0% of drivers with jerky trauma compared with 4.2% of those without such history. Sudden acceleration, braking, abrupt turns, road shocks, or repeated micro-traumatic movements may increase strain on cervical muscles, ligaments, and joints. These mechanisms are clinically plausible because cervicogenic headache can be provoked by cervical movement, awkward head positions, or pressure on tender cervical structures (4,18). Similar reasoning has been applied in literature discussing neck pain after motor vehicle collision exposure and cervical musculoskeletal strain (13). Still, the present data cannot establish temporality or causation, and the self-reported nature of jerky trauma may introduce recall bias.

Whole-body vibration was another important driving-related factor. Cervicogenic headache was present in 63.2% of drivers who reported whole-body vibration, compared with very low prevalence among drivers reporting other vibration sites. Vibration transmitted through the vehicle seat and body may contribute to cervical muscle activation, postural guarding, and cumulative fatigue. This may be particularly relevant in drivers who spend long hours in vehicles with poor suspension, poor seat support, or rough road exposure. The association between vibration and cervicogenic headache in this study supports the need for ergonomic and vehicle-environment assessment, including seat quality, vibration damping, driving posture, and rest-break patterns (3,5,6,16). However, vibration exposure was self-reported rather than objectively measured, and future studies should consider accelerometer-based or vehicle-based vibration assessment.

Neck and shoulder muscle symptoms showed a consistent clinical gradient. Cervicogenic headache was reported by 84.2% of drivers who always experienced aching, 72.5% of those who always experienced fatigue, and 90.0–100.0% of those reporting sometimes-to-always twitching. These findings support the biomechanical relevance of cervical and shoulder muscle symptoms in drivers with cervicogenic headache. Sustained driving posture can increase static loading of cervical extensor muscles, upper trapezius, levator scapulae, and shoulder girdle stabilizers, potentially contributing to tenderness, fatigue, and movement-related headache provocation (1,2,9,17). Cervical proprioceptive impairment and altered sensorimotor control have also been described in people with neck pain, which may help explain why repeated muscle symptoms and cervical dysfunction are clinically interrelated (1).

Seat adjustment while driving was not associated with cervicogenic headache in the current analysis. Cervicogenic headache was present in 47.1% of drivers who adjusted their seat and 47.1% of those who

did not. This finding should be interpreted carefully. It does not necessarily mean that ergonomics are unimportant; rather, it may indicate that the study measured seat adjustment as a simple yes/no variable without assessing whether the adjustment was biomechanically correct, maintained during driving, or sufficient for cervical support. Future studies should assess ergonomic setup more precisely, including seat height, backrest angle, lumbar support, headrest position, steering distance, mirror height, and pedal reach (3,5,6,16).

The findings are broadly consistent with previous studies reporting a high burden of neck pain and musculoskeletal symptoms among drivers and occupational groups exposed to prolonged sitting and static posture (5,6,12,14–17). For example, previous work among taxi drivers and helmet-wearing occupational bike riders has shown notable frequencies of neck pain, reduced cervical mobility, and neck disability (14,15). The present study extends this evidence by focusing specifically on cervicogenic headache and by examining driving habits, vibration exposure, jerky trauma, and neck-shoulder muscle symptoms in professional drivers. This makes the findings clinically relevant for preventive occupational health strategies, including driver education, vehicle ergonomic modification, scheduled rest breaks, cervical mobility exercises, and early screening for neck-related headache symptoms (3,5,6).

This study has several limitations. The cross-sectional design prevents conclusions about causality or temporal sequence. Convenience sampling may limit generalizability to all professional drivers. Several variables, including driving habits, jerky trauma, vibration exposure, and muscle symptoms, were self-reported and may be affected by recall or reporting bias. The statistical analysis relied on unadjusted chi-square tests; therefore, potential confounding by age, sex, daily driving duration, vehicle type, and years of experience was not controlled. Some categories had small cell counts, which may affect the assumptions of chi-square testing. In addition, some originally reported biomechanical variables required data audit because their subgroup totals were not internally consistent. Future studies should use validated diagnostic criteria for cervicogenic headache, objective ergonomic and vibration measurements, larger probability-based samples, and multivariable regression models to identify independent associations (4,18).

Overall, the study provides useful preliminary evidence that cervicogenic headache among professional drivers is associated with longer driving experience, vehicle type, jerky trauma, whole-body vibration, and frequent neck and shoulder muscle symptoms. These findings support the need for occupational health strategies targeting cervical loading and vehicle ergonomics among professional drivers. However, the results should be presented as unadjusted associations, and conclusions should avoid causal or predictive wording unless future longitudinal or adjusted analyses are performed.

CONCLUSION

Cervicogenic headache was common among professional drivers, affecting nearly half of the study participants. Significant unadjusted associations were observed between cervicogenic headache and longer driving experience, vehicle type, history of jerky trauma while driving, whole-body vibration, and frequent neck and shoulder muscle symptoms, including aching, fatigue, and twitching. Seat adjustment was not associated with cervicogenic headache in this dataset. These findings suggest that occupational driving exposure and cervical-region biomechanical symptoms may be important considerations in driver health assessment, ergonomic education, and preventive musculoskeletal care. Because this was a cross-sectional study using unadjusted analyses, the findings should be interpreted as associations rather than causal effects or independent predictors.

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