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Physical risk factors associated with non-specific neck pain among office workers: A review

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Abstract:

Non-specific neck pain is common among office workers due to prolonged computer use. Therefore, it is of interest to review data on its physical risk factors. Key modifiable factors included prolonged sitting, forward head posture, excessive screen use, poor ergonomics, reduced cervical muscle endurance and physical inactivity. Available data supports ergonomic correction, active work breaks, postural training and cervical muscle exercises to reduce neck pain. Thus, available data help guide workplace prevention and ergonomic interventions.

Keywords: Non-specific neck pain, office workers, physical risk factors, forward head posture, sedentary behaviour, ergonomics, computer work

Background:

Neck pain is one of the most prevalent musculoskeletal disorders worldwide and a leading contributor to years lived with disability, with a considerable and rising personal, occupational and economic burden [1]. Global Burden of Disease analyses confirm that neck pain affects a large share of the adult population and that its impact continues to grow with population growth and ageing [2]. The majority of cases are classified as “non-specific”-that is, pain without an identifiable structural or pathological cause-and are widely accepted to be multifactorial in origin, arising from an interaction of individual, physical (biomechanical and occupational) and psychosocial factors [3]. Office and computer workers represent a particularly high-risk occupational group and identifying the physical risk factors that drive neck pain in this population is essential for designing effective prevention strategies [4]. This narrative review focuses specifically on the physical risk factors associated with non-specific neck pain in office workers, drawing on evidence published between 2020 and 2025. Office work is characterised by prolonged sitting and sustained, low-level static loading of the cervical and shoulder-girdle musculature. Even short periods of continuous computer work can produce measurable physiological changes; a controlled study demonstrated that as little as one hour of computer use altered nerve conduction velocity and muscle activity in office workers, illustrating how quickly sustained postural demand affects the neuromuscular system [5]. Repeated and prolonged exposure to this static loading is thought to contribute to alter pain processing: office workers with chronic neck pain exhibit lowered pressure pain thresholds, a marker of peripheral and central sensitisation, compared with pain-free controls [6]. Therefore, it is of interest to review the current evidence on the physical risk factors associated with non-specific neck pain among office workers based on studies published between 2020 and 2025.

Awkward neck posture and forward head posture:

Sustained non-neutral neck postures-particularly a forward-bent neck and forward head posture (FHP)-are consistently implicated in office-worker neck pain. A reduced craniovertebral angle, the standard quantitative marker of FHP, distinguishes

individuals with postural neck pain from those without [7] and FHP is associated with wider alterations in balance and load distribution, indicating effects that extend beyond the neck itself [8]. Importantly, FHP is common yet modifiable in desk-based workers: structured postural, scapular-stabilisation and thoracic-extension exercise programmes improve craniovertebral angle and reduce pain and disability [9, 10], reinforcing posture as both a risk factor and a target for intervention.

High screen time and smartphone use:

Beyond desktop work, the total daily exposure to digital screens has emerged as a relevant physical determinant of neck pain. Population data show that greater digital-device screen-viewing time is associated with a higher prevalence of chronic neck pain [11]. Heavy smartphone use is a specific contributor: individuals with high smartphone use adopt a more pronounced forward head posture and show reduced neck-muscle endurance and impaired cervical proprioception, all of which are plausibly linked to symptom development [12]. As office workers increasingly combine computer and mobile-device use across the day, cumulative screen exposure adds to the overall cervical load.

Reduced neck muscle strength and endurance:

Impaired performance of the cervical muscles, especially the deep cervical flexors, is a recognised physical characteristic associated with neck pain. Reduced deep cervical flexor endurance accompanies neck pain and targeted conditioning of these muscles improves pain, functional disability and endurance [13]. Endurance-focused training augmented with pressure biofeedback likewise increases deep cervical flexor endurance and reduces symptoms in individuals with mechanical neck pain [14]. Low baseline neck-muscle endurance may therefore act as a modifiable predisposing factor in sedentary workers whose posture provides little dynamic muscular demand.

Physical inactivity and infrequent work breaks:

Prolonged, uninterrupted sitting with few breaks reflects low occupational physical activity and is itself a risk exposure. A cluster-randomised trial in high-risk office workers showed that

promoting regular active breaks or postural shifts markedly reduced the new onset of neck (and low-back) pain over follow-up, with substantial protective effects relative to usual practice [15]. This indicates that the absence of movement and postural variation-not merely the sitting posture in isolation-contributes to symptom development and that reintroducing movement is protective [15].

Work-from-home and ergonomic workstation factors:

The quality of the physical workstation modulates cervical loading, a factor brought into sharp focus by the large-scale shift to working from home. A prospective cohort of office workers found that transitioning to home working altered the incidence of non-specific neck and low-back pain, with the balance of days worked at home versus the office influencing risk [16]. A rapid review of the work-from-home literature similarly reported a high prevalence of neck pain, attributed in large part to inadequate ergonomic set-ups and longer, less structured working days [17]. Poorly configured workstations-for example, inappropriate monitor height or unsupportive seating-promote the very awkward postures and sustained loading described above (Table 1). The physical risk factors reviewed here-prolonged sitting and computer-use duration, awkward and

forward head posture, high screen and smartphone exposure, deficient neck-muscle endurance, physical inactivity and non-ergonomic workstations-are neither independent nor mutually exclusive. Rather, they cluster and reinforce one another: a poorly configured workstation encourages forward head posture, which is sustained during long periods of uninterrupted computer and smartphone use and which in turn is poorly tolerated by cervical muscles with low endurance [16]. A consistent and encouraging theme across the recent evidence is that these factors are modifiable. Interventions that correct posture, strengthen the deep cervical flexors, introduce regular active breaks and postural variation and optimise the ergonomic environment each reduce the onset or severity of non-specific neck pain [17]. The work-from-home literature further underscores that changes in the physical work environment translate directly into changes in neck-pain risk [18]. Because most office-worker neck pain is non-specific and multifactorial [19, 20], prevention is best framed as a combined strategy that simultaneously addresses posture, movement, muscular capacity and workstation design rather than any single factor in isolation.

Table 1: Summary of physical risk factors for non-specific neck pain in office workers

Physical risk factor	Key findings
Prolonged sitting /sustained computer work	Sustained static cervical loading; even 1 hour of computer use alters nerve conduction and muscle activity; office workers with neck pain show reduced pressure pain thresholds
Awkward posture / forward head posture	Reduced craniovertebral angle distinguishes postural neck pain; FHP alters balance and loading; modifiable with postural and scapular exercise
High screen time / smartphone use	Greater screen-viewing time linked to higher chronic neck-pain prevalence; heavy smartphone use worsens FHP, endurance and proprioception
Reduced neck muscle strength/ endurance	Low deep cervical flexor endurance accompanies neck pain; targeted training improves pain, disability and endurance
Physical inactivity / infrequent breaks	Uninterrupted sitting increases risk; active breaks and postural shifts reduce new-onset neck pain
Work-from-home / poor ergonomics	Transition to home working and non-ergonomic set-ups alter and increase neck-pain incidence

Conclusion:

Non-specific neck pain in office workers is driven by a set of interrelated and largely modifiable physical risk factors centred on sustained cervical loading, poor posture, high screen exposure, low neck-muscle endurance, physical inactivity and inadequate ergonomics. Recent data supports multicomponent prevention-ergonomic optimisation, regular active breaks and postural change and deep cervical muscle conditioning-as the most rational approach. Further data will help quantify the relative contribution of each factor and to define the most effective, scalable workplace interventions.

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