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UPPER CROSSED SYNDROME IN CORPORATE PROFESSIONALS: A CROSS-SECTIONAL SURVEY OF PREVALENCE AND ASSOCIATED RISK FACTORS

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Abstract
Upper Cross Syndrome (UCS) is a common musculoskeletal disorder in office workers, marked by muscular imbalances in the neck and shoulder region. This study aimed to assess the prevalence of UCS among corporate workers and identify contributing factors like gender, age, BMI, work setting, working hours, screen time, and job hierarchy. A cross-sectional study of 85 participants used the Occupational Sitting and Physical Activity Questionnaire (OSPAQ) and physical assessments to evaluate UCS. Results showed that 31.76% of participants had UCS, with higher prevalence in females (40.43%) and those aged 31-40 (42.86%). UCS was more common among remote workers (35.85%) and those working over 12 hours (41.67%). A significant correlation was found between screen time and UCS. The findings highlight the need for ergonomic interventions and posture training to reduce UCS in office workers.

Keywords: Upper crossed syndrome, Posture, office ergonomics, musculoskeletal health, work related pain

Introduction

Musculoskeletal disorders (MSDs), including Upper Crossed Syndrome (UCS), are among the leading causes of work-related health issues globally, particularly among office workers (Yaghoubitajani et al., 2021). UCS is characterized by muscular imbalances in the neck and shoulder region, with tightness in tonic muscles such as the pectorals and upper trapezius, and weakness in phasic muscles like the deep neck flexors, middle and lower trapezius, and serratus anterior (Chaudhuri et al., 2024). This imbalance contributes to significant postural deviations and associated discomfort.

The biomechanical effects of UCS include lordotic curvature in the cervical spine, increased kyphotic curvature in the thoracic spine, and protracted or rounded shoulders. Patients often report symptoms such as neck pain, strain in the upper back, chest pain, and sensations of numbness or tingling in the shoulders. These symptoms arise from strain on the affected muscles, tendons, and joints, leading to a modified biomechanical posture in the upper back (Moore et. al., 2024; Levangie et. al.,2019). The rapid pace of industrialization and urbanization has further exacerbated health concerns related to prolonged sedentary work. Neck pain, a common manifestation of UCS, is increasingly prevalent among computer users, with 59% of work-related musculoskeletal disorders (WRMSDs) reported annually by IT professionals in India attributed to neck pain. Additionally, sickness absenteeism due to neck pain accounts for approximately 41% of cases (Kalim khan et al., 2016). The rise of digital device usage has introduced the phenomenon of "tech neck," referring to neck pain and damage caused by prolonged downward gazing at smartphones, tablets, or other digital devices. These behaviors encourage sustained, uncomfortable postures, further contributing to the development and progression of UCS (Pais et al., 2021). Given these widespread implications, addressing the prevalence, risk factors, and consequences of UCS among corporate workers is critical. A comprehensive understanding of these factors can guide the development of targeted interventions to reduce the burden of UCS and enhance workplace health and productivity.

Methods

Study Design and Participants

This quantitative descriptive study employed a cross-sectional design and was conducted at the Rehav Clinic in Gurugram, Haryana. Participants were recruited using convenience sampling and snowball sampling methods. The study included workers who met the following inclusion criteria: aged 18 years and above, spent at least 3 hours daily working on a computer, sat for 60% of their work time, and had been employed in corporate jobs for the past two years. Ultimately, a total of 85 participants were included in the study.

Data Collection

The data was collected using the Occupational Sitting and Physical Activity Questionnaire (OSPAQ), a validated tool designed to assess self-reported percentages of sitting, standing, walking, and heavy labor at work over the past seven days, along with the number of days worked during that period.
The questionnaire also included socio-demographic information (e.g., gender, age, BMI) and details about working conditions, such as work-from-home or office setup, work schedule, working hours, and workdays. Participants were guided on how to accurately report their activity percentages. To evaluate UCS, specific physical characteristics were assessed, including shortened length of muscles such as the upper trapezius, pectoralis major, sternocleidomastoid, suboccipital, and levator scapulae (Kendall et al., 2005), as well as weakness in muscles like the serratus anterior, middle trapezius, lower trapezius, and anterior scalene. Additionally, the distance between the lateral central line of the shoulder and the lateral central line of the ear was measured to be more than 1 cm but less than 5 cm. This combined approach helped assess the postural and muscular imbalances characteristic of UCS among the participants.

Results

In this study, 27 out of 85 participants (31.76%) were diagnosed with Upper Cross Syndrome (UCS). The gender-based analysis revealed that 21.05% of males and 40.43% of females were affected by UCS. Age-wise, UCS was most common in individuals aged 31 to 40 (42.86%), followed by those in the 41 to 50 range (36%). Among the BMI categories, 44.44% of overweight participants had UCS, while 28.57% of underweight individuals and 22.22% of obese participants were affected. The work setting analysis showed that 35.85% of people working from home and 25% of those working from the office experienced UCS. In terms of working hours, 41.67% of participants working over 12 hours and 34.21% of those working 8-12 hours had UCS. The incidence was also higher in individuals with

higher screen time, with 36.36% of those spending over 30 hours per week on screens affected by UCS. Hierarchically, 36.11% of team members and 35.29% of team leaders/managers had UCS, while 28.57% of general managers/heads and 18.18% of senior admins were affected. Lastly, all participants experiencing pain occasionally, almost every month, or continuously had UCS, indicating a strong association between UCS and pain frequency.

Table 1. Characteristics of socio-demographics

Category	Subcategory	People with UCS	Total Participants	Percentage (%)
Gender	Male	8	38	21.05%
	Female	19	47	40.43%
Age Group	21 to 30	2	15	13.33%
	31 to 40	15	35	42.86%
	41 to 50	9	25	36.00%
	51 to 60	1	10	10.00%
BMI	Underweight	2	7	25.00%
	Normal	3	23	13.04%
	Overweight	20	45	44.44%
	Obese	2	9	22.22%
Work Location	WFH	19	53	35.85%
	WFO	8	32	25.00%
Working Hours	<8 hours	4	23	17.39%
	8–12 hours	13	38	34.21%
	>12 hours	10	24	41.67%
Screen Time	<20 hours	2	12	16.67%
	20–30 hours	9	29	31.03%
	>30 hours	16	44	36.36%
Hierarchy	Team Member	13	36	36.11%
	Team Leader/Manager	6	17	35.29%
	General Manager/Head	6	21	28.57%
	Senior Admin	2	11	18.18%
Pain Frequency	Occasionally	17	17	62.96%
	Almost Every Month	8	8	29.63%
	Continues	2	2	7.41%

BMI Body mass index, WFH Work from home, WFO Work from office

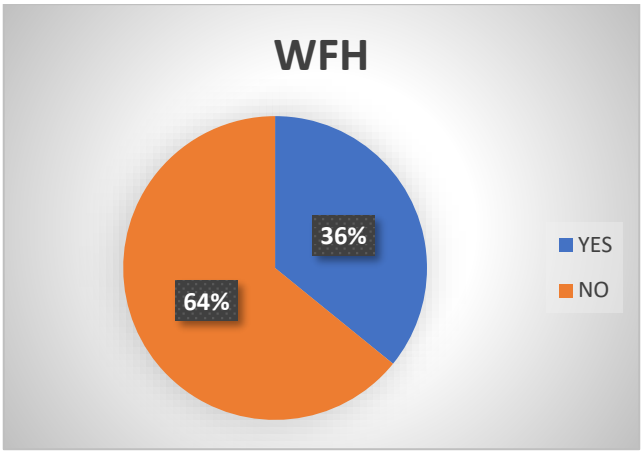

Fig 1. UCS in WFH employees

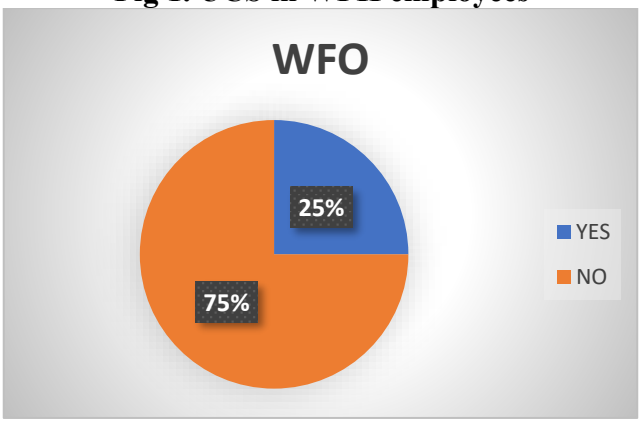

Fig 2. UCS in WFO employees

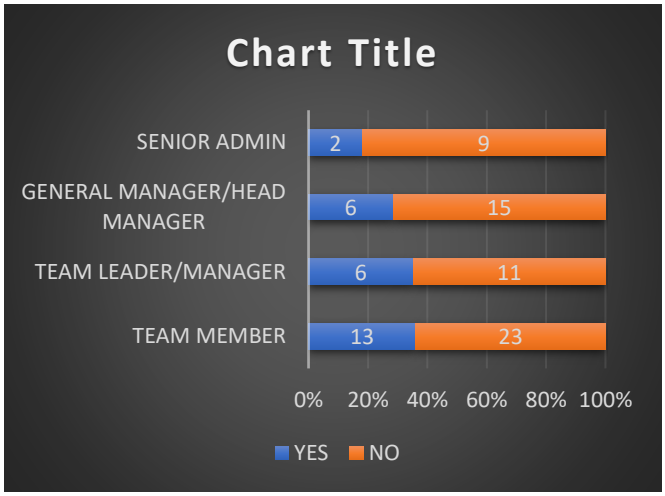

Fig 3. UCS among different hierarchical levels

Discussion

The findings of this study shed light on the prevalence of Upper Cross Syndrome (UCS) in corporate workers, highlighting a significant health concern within this demographic. The study identified that 31.76% of the 85 participants were diagnosed with UCS, which is consistent with previous research indicating a high prevalence of musculoskeletal disorders (MSDs) in office environments (Yaghoubitajani et al., 2021). The gender distribution revealed that a higher proportion of females (40.43%) were affected compared to males (21.05%). This gender disparity may be influenced by a variety of factors, including differences in posture, ergonomics, and muscle strength between men and women, as well as potential variations in work-related stress or job demands (Crawford et. al., 2020).

Age-related differences in the prevalence of UCS were also notable, with individuals aged 31 to 40 showing the highest incidence (42.86%), followed by those in the 41 to 50 range (36%). This age group may be particularly vulnerable to UCS due to long-term exposure to office work, poor posture, and increased workloads that lead to muscular imbalances over time. The increasing trend of neck and back pain among middle-aged individuals can be attributed to the cumulative effects of prolonged sitting and inadequate posture, which progressively deteriorate musculoskeletal health.

The work setting analysis revealed that a higher percentage of workers in the "work from home" (WFH) category (35.85%) experienced UCS compared to those working from the office (25%). This finding highlights the potential impact of home office ergonomics and less structured working environments on musculoskeletal health. WFH arrangements often lack the ergonomic interventions commonly found in office settings, such as adjustable chairs and desks, which may result in poor posture and increased strain on the neck and shoulders (Chaudhuri et al., 2024).

The prevalence of UCS in remote workers emphasizes the need for proper ergonomics and workspace setup, particularly for those working long hours in non-ergonomic environments. Furthermore, the study found a clear relationship between working hours and the prevalence of UCS, with 41.67% of individuals working over 12 hours a day and 34.21% of those working 8 to 12 hours affected by UCS. Prolonged sitting, particularly during long working hours, is a well-documented risk factor for the development of UCS. Long periods of sustained postures, such as sitting in front of a computer or desk, contribute to muscular imbalances, particularly in the neck and upper back, which exacerbate the symptoms of UCS. Postural issues commonly linked with Upper Crossed Syndrome (UCS) include forward head posture (FHP), an exaggerated cervical curve, excessive thoracic kyphosis, protracted and raised shoulders (rounded shoulders), and scapular winging accompanied by increased internal rotation and abduction. (Kalim Khan et al., 2016) (Chang et. al., 2023).

The significant correlation between screen time and UCS was also observed, with 36.36% of participants spending over 30 hours per week on screens being affected by UCS. The rise of "tech neck" due to excessive smartphone and computer use has been widely recognized as a major contributing factor to the development of neck and shoulder pain. The posture adopted during screen use, such as prolonged downward gazing, can strain the cervical spine and the surrounding musculature, resulting in the symptoms characteristic of UCS (Pais et al., 2021).

Hierarchical differences in UCS prevalence were also observed, with team members (36.11%) and team leaders/managers (35.29%) experiencing the highest rates of UCS, while general managers/heads (28.57%) and senior admins (18.18%) showed lower prevalence. This could be due to the physical demands or job stress faced by team members and managers, which may lead to longer hours of sitting and poor posture. Additionally, senior-level workers might have more flexibility in their work arrangements, potentially reducing the risk of musculoskeletal discomfort.

Finally, the study found a strong association between UCS and pain frequency. All participants who experienced pain occasionally, almost every month, or continuously had UCS, underlining the close relationship between chronic pain and musculoskeletal disorders. The high prevalence of pain in individuals with UCS reinforces the need for early intervention, particularly in the corporate setting, to address discomfort before it develops into chronic pain.

As to sum up, this study highlights the alarming prevalence of Upper Cross Syndrome in corporate workers, particularly among females, individuals aged 31 to 50, overweight individuals, remote workers, and those with extended working hours or excessive screen time. These findings underscore the importance of proactive measures such as ergonomic interventions, regular breaks, and proper posture training to mitigate the risk of UCS and improve overall workplace health and productivity. Further research is needed to explore effective strategies for preventing and managing UCS in office-based environments.

Conclusion

In conclusion, this study found that 31.76% of office workers were affected by Upper Crossed Syndrome (UCS), with higher prevalence among females (40.43%) compared to males (21.05%).

UCS was most common in individuals aged 31-40 and those with overweight status. Those working from home and spending longer hours on screens had a higher incidence of UCS. Team members and team leaders/managers also showed higher rates compared to senior-level staff. Additionally, UCS was strongly associated with pain frequency, indicating its significant impact on workers' health.

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