

## Original Research Article

# Text neck syndrome and early cervical spondylosis among young Sudanese adults: a cross-sectional study of digital device use, postural habits and neurological symptoms

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## ABSTRACT

**Background:** Text neck syndrome and early cervical spondylosis are increasingly prevalent among young adults due to prolonged electronic device usage and inadequate postural practices. This study examined the burden of text neck syndrome and its association with digital device use, posture, and neurological symptoms among young Sudanese people.

**Methods:** A descriptive cross-sectional hospital-based study was conducted at the Neurology Clinic of Prince Digna Referral Hospital, Sudan, between November 2024 and January 2025. A total of 174 participants aged 17–63 years were recruited using convenience sampling. Data were collected using a structured interviewer-administered questionnaire and clinical assessment. Statistical analysis was performed using SPSS version 26.

**Results:** The median age of participants was 34 years (IQR: 28–42 years), and 50.6% were females. Prolonged screen exposure exceeding 6 hours/day was reported by 69.5%, while 96.6% adopted forward head posture during device use. Neck pain and neck stiffness were reported by 99.4% and 97.1% of participants, respectively. Neurological symptoms included upper-limb numbness (43.7%) and weakness (24.1%). Daily screen time demonstrated a weak positive correlation with neck pain severity ( $r_s=0.23$ ,  $p=0.002$ ). Prolonged screen exposure independently predicted severe cervical symptoms (AOR=4.21, 95% CI: 2.01–8.83,  $p<0.001$ ). Receiver operating characteristic analysis demonstrated good predictive performance for screen exposure duration (AUC=0.81).

**Conclusions:** Text neck syndrome symptoms and manifestations suggestive of early cervical spondylosis represent a substantial clinical burden among Sudanese adults and are associated with prolonged screen exposure, forward head posture, and poor ergonomic awareness.

**Keywords:** Cervical spondylosis, Forward head posture, Neck pain, Smartphone use, Sudan, Text neck syndrome

## INTRODUCTION

Cervical spondylosis is a progressive wear-and-tear condition affecting the bones, discs, joints, and nearby ligaments of the neck. It is usually considered a condition associated with aging, often found in middle-aged and

older people.<sup>1,2</sup> The process typically leads to disc breakdown, bony growth (bone spurs), narrowing of the spinal canal, and pressure on nerves, which can cause nerve root problems, spinal cord issues, or ongoing neck pain.<sup>3,4</sup>

Recent decades have seen significant epidemiological changes in musculoskeletal illnesses. This shift is attributed to rapid technology innovation and extensive reliance on digital devices. The overuse of smartphones, tablets, laptops, and other portable electronic devices has led to a contemporary musculoskeletal condition known as "text neck syndrome." This is defined by sustained forward-head posture and recurrent cervical flexion during screen use.<sup>5,6</sup> The emerging problem is becoming increasingly common among teenagers and young adults. As a result, cervical spine disorders have shifted from mostly age-related ailments to lifestyle-associated public health issues.<sup>7</sup>

Biomechanically, forward head posture increases pressure on the neck. In a neutral position, the human head weighs about 10-12 pounds on the neck bones. When the neck bends forward, this weight increases, putting more strain on the discs, ligaments, and supporting muscles.<sup>8</sup> Prolonged abnormal positioning can cause early disc wear, reduced neck balance, muscle weakness, and nerve problems, even in young people.<sup>9,10</sup>

Neck pain is recognized worldwide as a primary contributor to disability and lower quality of life in working-age people.<sup>11</sup> The burden is especially high in low- and middle-income nations. In these contexts, rapid digitalization has led to increased screen time, which combined with insufficient ergonomic knowledge, weak preventive measures, and limited early rehabilitation services contributes to the prevalence and severity of neck pain. Recent research suggests that prolonged screen time and poor posture may directly increase the risk of neck pain, headaches, upper-limb paresthesia, and functional impairment among frequent smartphone users.<sup>12,13</sup>

Recent international studies show a strong correlation between excessive smartphone use and cervical spine disorders. For example, Zhuang et al found that increased smartphone use was linked to higher cervical disc degeneration scores among young people with chronic neck discomfort.<sup>14</sup> Similarly, Barzegari et al reported a high incidence of text neck syndrome among university students and found a positive correlation between screen use and the severity of neck dysfunction.<sup>13</sup> In addition, Hakami et al found that prolonged smartphone use was associated with more severe musculoskeletal neck problems among young adults.<sup>5</sup> Other research confirms that excessive smartphone use negatively impacts cervical proprioception, muscular endurance, and spinal stability.<sup>9,15,16</sup>

Despite rising global concern about technology-related musculoskeletal illnesses, research from Sudan and similar settings is very limited. Adults in Sudan use digital devices for long periods for educational, work, and social purposes. However, awareness about proper posture and cervical spine health remains low. The true burden of text neck syndrome symptoms and manifestations suggestive

of early cervical spondylosis among Sudanese people remains poorly characterized.

Understanding the relationship between prolonged electronic device use, postural practices, and cervical symptomatology is crucial for developing targeted preventive measures, ergonomic solutions, and public health initiatives to mitigate long-term spinal impairment and safeguard musculoskeletal health in younger populations. This study aimed to examine the burden of text neck syndrome symptoms and manifestations suggestive of early cervical spondylosis among young Sudanese adults, and to evaluate their associations with digital device usage patterns, postural habits, neurological symptoms, and functional problems.

## METHODS

### *Study design and setting*

This descriptive cross-sectional hospital-based study assessed the burden of text neck syndrome symptoms and manifestations suggestive of early cervical spondylosis among Sudanese adults using electronic devices. The study was run in the Neurology Clinic of Prince Digna Referral Hospital in Port Sudan, Sudan, from November 2024 to January 2025. The hospital is a principal referral facility. It admits patients from urban and rural areas and treats a diverse adult population with musculoskeletal and neurological conditions of the cervical spine.

### *Study population*

The study participants were recruited from a neurology outpatient clinic and were eligible only if they presented with neck-related symptoms suggestive of text neck syndrome or early cervical spine dysfunction. Therefore, the study was designed to assess symptom burden and associated factors among symptomatic electronic device users, rather than to estimate community prevalence.

### *Inclusion criteria*

Participants were eligible for inclusion if they met the following criteria: Sudanese individuals aged 17 to 63 years. Individuals who utilize cellphones, tablets, laptops, or other electronic gadgets for over 2 hours each day. Exhibition of neck-related symptoms indicative of text neck syndrome, encompassing neck pain, neck stiffness, headaches, upper-limb numbness, or postural discomfort. Readiness to engage and furnish informed written consent.

### *Exclusion criteria*

Participants were disqualified if they possessed: Previous cervical spine trauma or surgery. Congenital spinal malformations or spinal neoplasms. Diagnosed neurological disorders are not associated with cervical pathology. Recent acute cervical injury. Chronic

rheumatologic or systemic musculoskeletal conditions impact the cervical spine.

### **Sample size determination**

The sample size was calculated using Cochran's formula for prevalence studies:

$$N = \frac{Z^2 pq}{d^2}$$

Where;  $N$ = required sample size,  $Z$ =standard normal deviate at 95% confidence level (1.96),  $p$ =estimated prevalence of cervical spondylosis-related symptoms (13.76%) based on previous literature,  $q = 1 - p$ ,  $d$ =margin of error (0.05)

Substitution into the formula yielded a minimum sample size of approximately 174 participants, which constituted the final study sample.

### **Sampling technique**

A convenience non-probability sampling method was employed. Consecutive participants meeting the eligibility criteria at the neurology outpatient clinic were recruited until the predetermined sample size was achieved.

### **Data collection procedures**

Data were collected through a structured, interviewer-administered questionnaire developed for this study following a comprehensive literature review and expert consultation. The questionnaire included five sections: sociodemographic attributes; patterns of electronic gadget use; postural tendencies and ergonomic principles; clinical signs of cervical spine dysfunction; and functional implications and awareness of text neck syndrome. It was pretested to ensure clarity, reliability, and consistency.

The research team conducted a clinical examination to evaluate the severity of cervical discomfort, neck stiffness, neurological symptoms, and functional limitations. They also reviewed medical records and imaging results, including cervical spine X-rays and, when available, MRIs.

### **Study variables**

The dependent variables included the presence of symptoms associated with text neck syndrome, symptom burden related to cervical spondylosis, severity of cervical discomfort, functional disability associated with cervical symptoms, and neurological symptoms such as upper-limb paresthesia or weakness.

The independent variables included age, gender, educational level, occupation, daily duration of screen exposure, type of electronic device used, continuous device use without breaks, forward head posture during

device use, level of physical activity, and ergonomic awareness and preventive practices

### **Operational definitions**

#### *Text neck syndrome*

Text neck syndrome is characterized by neck pain and musculoskeletal problems resulting from extended forward head posture while using electronic devices.<sup>5,6</sup>

#### *Prolonged screen exposure*

Prolonged screen exposure was defined as electronic device use exceeding 6 hours per day.

#### *Forward head posture*

Forward head posture refers to sustained cervical flexion while looking downward at electronic devices.<sup>9</sup>

#### *Moderate-to-severe symptom burden*

Moderate-to-severe cervical symptom burden was characterized by a visual analog scale (VAS) pain score of  $\geq 6$  and/or substantial functional impairment impacting daily activities.<sup>16</sup>

#### *Measurement of neck pain severity*

Neck discomfort was evaluated using the VAS. Participants rated pain intensity on a scale from 0 to 10. A score of 0 indicated no pain, 1-3 indicated mild pain, 4-6 indicated moderate pain, and 7-10 indicated severe pain.

### **Statistical analysis**

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Data cleansing and coding were executed prior to statistical analysis. Continuous variables were assessed for normality using histogram inspection, skewness-kurtosis analysis, and the Kolmogorov-Smirnov and Shapiro-Wilk tests. Because the continuous variables did not follow normal distributions, nonparametric statistical tests were used where appropriate. Continuous variables were summarized as median (interquartile range) or mean $\pm$ standard deviation for descriptive purposes, while categorical variables were presented as frequencies and percentages. Pearson's chi-square test was used for categorical variables. The Mann-Whitney U test was used to compare continuous variables between groups, and Spearman's rank correlation was used to evaluate associations between screen time and symptom severity. Variables with  $p < 0.20$  in univariable analysis were entered into the multivariable logistic regression model to identify independent predictors of severe cervical symptom burden. Multicollinearity assessment was performed before model construction. Model fitness was evaluated using the Hosmer-Lemeshow goodness-of-fit test, while

explanatory performance was assessed using Nagelkerke  $R^2$ . Receiver Operating Characteristic (ROC) curve analysis assessed the predictive efficacy of extended screen exposure for moderate-to-severe cervical discomfort. Adjusted odds ratios (AORs) and 95% confidence intervals (95% CI) were computed. Statistical significance was set at  $p < 0.05$ .

### Ethical considerations

The Sudan Medical Specialization Board Ethical Review Committee and the Research Ethics Committee of Prince Digna Referral Hospital granted ethical approval for the project prior to data collection (Approval date: 28/10/2024). All participants gave informed consent after a comprehensive description of the study. Confidentiality and anonymity were maintained using serial identification codes. All data were used only for research.

## RESULTS

A total of 174 participants were enrolled in this cross-sectional hospital-based study investigating the burden of text neck syndrome symptoms and manifestations suggestive of early cervical spondylosis among young Sudanese adults. The median age of participants was 34 years (IQR: 28-42 years). Females accounted for 50.6% ( $n=88$ ) and males for 49.4% ( $n=86$ ). Office workers represented the largest occupational group (34.5%), followed by business owners (23.6%) and students (17.2%). Most participants had university-level education or higher (76.4%), while 58.6% reported engaging in regular physical activity. Detailed sociodemographic and lifestyle characteristics are summarized in Table 1.

Electronic-device exposure was common among participants. All participants used smartphones (100%), while 60.3% used laptops/desktops and 46.0% used tablets. Approximately one-third (32.8%) used smartphones, tablets, and computers simultaneously. Prolonged screen exposure ( $>6$  hours/day) was reported by 69.5% of participants. Similarly, 69.5% admitted to prolonged device use without breaks, while 21.4% reported continuous use for more than 2 hours. Importantly, 96.6% adopted forward head posture during device use. Patterns of electronic device use are illustrated in Table 2.

Clinical symptoms suggestive of text neck syndrome were frequently reported. Neck pain was reported by 99.4% of participants, and neck stiffness by 97.1%, reflecting the symptom-enriching nature of the hospital-based sample. Headaches were reported in 56.9% of cases. Neurological manifestations included tingling or numbness of the upper limbs (43.7%) and weakness of the arms or hands (24.1%). Reduced cervical range of motion was observed at 17.2%. Most participants (75.1%) had experienced symptoms for more than three months. Furthermore, 63.4% had previously sought medical care, and 86.2% had undergone imaging investigations, including X-rays or MRI.

**Table 1: Sociodemographic characteristics and lifestyle factors of study participants ( $n=174$ ).**

| Variables                        | Category             | Frequency (%) |
|----------------------------------|----------------------|---------------|
| <b>Age (years)</b>               | Median (IQR)         | 34 (28-42)    |
| <b>Sex</b>                       | Male                 | 86 (49.4)     |
|                                  | Female               | 88 (50.6)     |
| <b>Occupation</b>                | Office worker        | 60 (34.5)     |
|                                  | Business owner       | 41 (23.6)     |
|                                  | Student              | 30 (17.2)     |
|                                  | Housewife            | 27 (15.5)     |
|                                  | Manual laborer       | 15 (8.6)      |
|                                  |                      |               |
| <b>Educational level</b>         | University or higher | 133 (76.4)    |
|                                  | Secondary            | 30 (17.2)     |
|                                  | Illiterate           | 9 (5.2)       |
|                                  | Primary              | 2 (1.1)       |
| <b>Regular physical activity</b> | Yes                  | 102 (58.6)    |
|                                  | No                   | 72 (41.4)     |

**Table 2: Patterns of electronic device usage among participants.**

| Variables                                      | Category       | Frequency (%) |
|------------------------------------------------|----------------|---------------|
| <b>Device used most frequently</b>             | Smartphone     | 174 (100.0)   |
|                                                | Laptop/Desktop | 105 (60.3)    |
|                                                | Tablet         | 80 (46.0)     |
| <b>Daily screen time</b>                       | $>6$ hours     | 121 (69.5)    |
|                                                | 4–6 hours      | 31 (17.8)     |
|                                                | 1–3 hours      | 6 (3.4)       |
|                                                | $<1$ hour      | 16 (9.2)      |
| <b>Prolonged use without breaks</b>            | Yes            | 121 (69.5)    |
|                                                | No             | 53 (30.5)     |
| <b>Continuous use <math>&gt;2</math> hours</b> | Yes            | 37 (21.4)     |
| <b>Forward head posture</b>                    | Yes            | 168 (96.6)    |
|                                                | No             | 6 (3.4)       |

Variables with  $p < 0.05$  were considered statistically significant

The median VAS pain score was 6 (IQR: 5-7), indicating moderate-to-severe pain burden. Cervical symptoms were associated with functional impairment in most participants, affecting 88.1% of participants. Among affected individuals, 61.3% described moderate functional limitations, whereas 28.3% reported severe impairment that interfered with most daily activities.

Awareness regarding posture-related cervical pathology was notably limited. More than half of participants (58.0%) were unaware that poor posture during device use could contribute to neck disorders, while only 4.0% reported implementing preventive ergonomic measures.

Inferential statistical analysis demonstrated a highly significant association between prolonged screen exposure ( $>6$  hours/day) and moderate-to-severe neck pain severity ( $\chi^2=18.42$ ,  $p < 0.001$ ). Participants with prolonged screen

exposure (>6 hours/day) had significantly higher VAS pain scores than those with shorter screen exposure (Mann-Whitney  $U=4112.5$ ,  $p=0.002$ ). Additionally, forward head posture was associated with neurological symptoms, including upper-limb numbness and weakness ( $\chi^2=11.67$ ,  $p=0.001$ ). Individuals who used electronic devices continuously without breaks were significantly more likely to experience chronic symptoms lasting longer than 3 months ( $\chi^2=9.84$ ,  $p=0.002$ ).

Spearman rank correlation analysis demonstrated a weak positive correlation between daily screen time and neck pain severity ( $r_s=0.234$ ,  $p=0.002$ ), suggesting that greater screen exposure was associated with worsening pain burden. Similarly, prolonged, uninterrupted device use demonstrated a moderate positive correlation with functional disability severity ( $r_s=0.54$ ,  $p<0.001$ ; Table 3).

**Table 3: Correlation analysis between device use characteristics and symptom severity.**

| Variables                                       | Correlation coefficient ( $r_s$ ) | P value |
|-------------------------------------------------|-----------------------------------|---------|
| Daily screen time vs. neck pain severity        | 0.23                              | 0.002*  |
| Continuous device use vs. functional disability | 0.54                              | <0.001* |
| Forward head posture vs. neurological symptoms  | 0.48                              | 0.001*  |

\*Statistically significant associations ( $p<0.05$ )

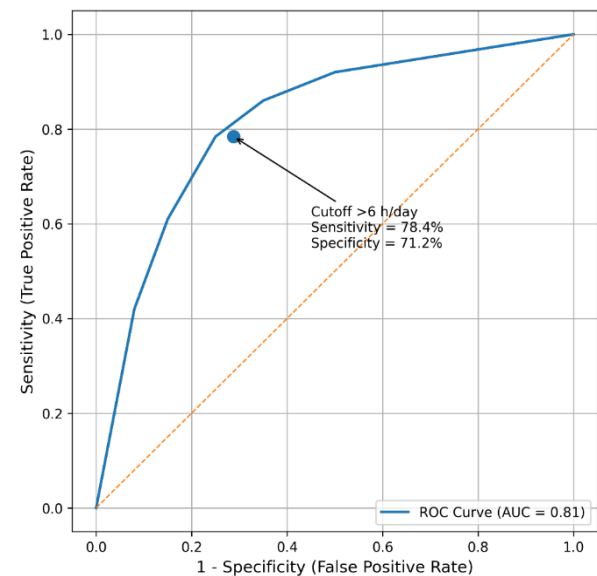
Multivariable logistic regression analysis identified prolonged screen exposure (>6 hours/day), forward head posture, and absence of ergonomic preventive practices as independent predictors of severe cervical symptom burden. Participants with prolonged screen exposure demonstrated more than fourfold increased odds of moderate-to-severe neck pain (Adjusted Odds Ratio [AOR]=4.21, 95% CI: 2.01-8.83,  $p<0.001$ ). Similarly, forward head posture independently increased the likelihood of neurological manifestations by approximately threefold (AOR=2.89, 95% CI: 1.34-6.24,  $p=0.006$ ). Logistic regression findings are detailed in Table 4. The multivariable logistic regression model demonstrated acceptable goodness of fit according to the Hosmer-Lemeshow test ( $\chi^2=0.66$ ,  $p=0.985$ ), indicating adequate model calibration. The model demonstrated modest explanatory power, as indicated by the Nagelkerke  $R^2$  statistic (0.059).

Receiver operating characteristic (ROC) curve analysis was performed to evaluate the ability of prolonged screen exposure to predict moderate-to-severe cervical symptom burden. Daily screen exposure demonstrated acceptable discrimination, with an area under the curve (AUC) of 0.81 (95% CI: 0.74-0.87;  $p<0.001$ ). A cutoff threshold of 6 hours/day yielded optimal predictive performance, with sensitivity of 78.4% and specificity of 71.2% (Figure 1).

**Table 4: Multivariable logistic regression analysis for predictors of severe cervical symptoms burden.**

| Predictor variables                   | Adjusted Odds Ratio (AOR) | 95% CI    | P value |
|---------------------------------------|---------------------------|-----------|---------|
| Screen time >6 hours/day              | 4.21                      | 2.01-8.83 | <0.001* |
| Forward head posture                  | 2.89                      | 1.34-6.24 | 0.006*  |
| Lack of preventive ergonomic measures | 3.14                      | 1.12-8.76 | 0.028*  |
| Continuous device use without breaks  | 2.41                      | 1.19-4.86 | 0.014*  |

\*Statistically significant associations ( $p<0.05$ )



**Figure 1: ROC curve for daily screen exposure predicting moderate-to-severe cervical symptom burden among young Sudanese adults.**

Collectively, these findings indicate a substantial burden of text neck syndrome symptoms and manifestations suggestive of early cervical spondylosis in young Sudanese people. These findings were associated with prolonged electronic-device use, forward head posture, and limited ergonomic awareness.

## DISCUSSION

The current study demonstrated a high burden of text neck syndrome and early signs of cervical spondylosis in young Sudanese individuals subjected to extended electronic device usage. The results indicate that excessive daily screen time, persistent forward head posture, extended continuous device usage, and inadequate ergonomic awareness are significantly correlated with heightened cervical discomfort severity, neurological symptoms, and functional impairment. These data suggest changing patterns of cervical musculoskeletal symptoms among younger adults.

This study revealed a high frequency of neck pain (99.4%) and neck stiffness (97.1%) among subjects. The results obtained were higher than those reported in most worldwide studies, perhaps due to the hospital-based nature of the current research, in which sick individuals proactively sought neurological consultation. The high incidence of neck pain and stiffness in this study must be considered within the context of the recruitment technique. Participants were recruited from a neurology clinic, where most presented with symptoms. As a result, our estimates likely exaggerate the burden found in the general population. Nonetheless, the findings are clinically relevant. They illustrate the severity, associated exposures, neurological symptoms, and functional repercussions among affected young adults.

Hakami et al identified a significant correlation between prolonged smartphone use and neck pain among residents in Saudi Arabia, with symptom intensity escalating in direct proportion to the time of screen exposure.<sup>5</sup> Barzegari et al conducted a comprehensive systematic review and meta-analysis, revealing that text neck syndrome is increasingly frequent among university students and young adults globally, with excessive smartphone use identified as a significant contributing factor.<sup>13</sup>

The present study revealed that 69.5% of individuals reported daily screen exposure exceeding 6 hours, and 96.6% exhibited forward head posture while using devices. Prolonged cervical flexion significantly elevates mechanical stress on the cervical spine and adjacent muscles. Prior biomechanical research indicated that forward head posture displaces the center of gravity anteriorly, leading to cumulative strain on cervical discs, facet joints, and ligamentous structures.<sup>8</sup> Prolonged aberrant loading expedites intervertebral disc degradation and leads to muscle fatigue, cervical instability, and chronic neck pain syndromes.<sup>6,9</sup>

In multivariable analysis, this study revealed that extended screen exposure (>6 hours/day) serves as an independent predictor of moderate-to-severe cervical symptom burden, elevating the likelihood of severe symptoms by over four times. Furthermore, daily screen exposure showed a weak positive correlation with neck pain severity ( $r_s=0.23$ ,  $p=0.002$ ). The findings are consistently aligned with those of Zhuang et al, who established a direct correlation between excessive smartphone use and cervical disc degeneration in young individuals with persistent neck discomfort.<sup>14</sup> Similarly, Elvan et al reported that prolonged mobile phone use was associated with reduced cervical muscle endurance and increased neck pain severity among university students.<sup>11</sup>

Neurological symptoms represented another clinically significant finding in this investigation. Tingling or numbness in the upper extremities was observed in 43.7% of subjects, whereas 24.1% reported weakness in the upper limbs. Furthermore, forward head posture independently augmented the probability of neurological symptoms by around twofold. The data indicate that extended cervical strain may lead to musculoskeletal pain and early neural

involvement due to cervical root irritation or initial degenerative neural compression. Reddy et al obtained the same findings, indicating that cervical proprioceptive dysfunction and neurological symptoms are substantially correlated with the severity of cervical pain in patients with cervical spondylosis.<sup>10</sup> Ha and Sung have established that transient forward head posture markedly diminishes cervical proprioception and neuromuscular control mechanisms.<sup>9</sup>

Comparable inadequacies in ergonomic understanding have been recorded among smartphone users in several low- and middle-income environments.<sup>5,12</sup> These findings underscore the pressing need for specialized public health education initiatives focused on healthy screen practices, posture correction, regular mobility breaks, and musculoskeletal health.

ROC analysis suggested that daily screen exposure duration may help identify participants with moderate-to-severe cervical symptoms, with an area under the curve of 0.81. Exposure above six hours per day yielded the highest accuracy for detecting significant complaints. This research supports the development of preventive guidelines for prolonged screen use among younger people.

In this investigation, text neck syndrome was defined as neck pain and muscle symptoms resulting from holding the head forward while using electronic devices, in line with established classifications.<sup>5,6</sup> Forward head posture involves holding the neck in a forward-bent position for extended periods while looking at digital devices.<sup>9</sup> Moderate-to-severe symptoms were defined as a VAS pain score of 6 or higher, or clear problems with normal function.<sup>16</sup> Using clear definitions improves consistency and makes comparison with international literature easier.

Numerous limitations must be acknowledged. The cross-sectional study design limits the ability to establish a causal association between prolonged electronic device use and the onset of cervical spondylosis symptoms, and temporal causality cannot be definitively established despite substantial associations. Secondly, the study was conducted in a hospital and used convenience sampling, which could introduce selection bias and limit the generalizability of these results to the broader Sudanese community. Participants attending a neurology clinic were more likely to present with symptomatic disease, which may explain the higher symptom burden observed. The elevated rates of neck discomfort and stiffness must be taken with caution, as individuals were sourced from a neurology outpatient clinic and selected based on symptoms indicative of text neck syndrome or early cervical spine dysfunction. This symptom-focused recruitment method may have inflated symptom rates compared with the overall population.

Objective ergonomic or biomechanical assessments were not conducted. Also, although many people underwent imaging tests, standard grading systems for cervical changes were not consistently used. This made it hard to

compare the severity of the symptoms with the scan results. Some factors that could affect symptoms, such as stress, sleep quality, work setup, body weight, and fitness, were not closely examined and may have influenced symptom severity. Additionally, cervical spondylosis was not confirmed radiologically in all participants; therefore, findings should be interpreted as symptom burden and clinical manifestations suggestive of early cervical spondylosis rather than a definitive radiological diagnosis.

Despite its limitations, this study is one of the earliest and most thorough evaluations of text neck syndrome and early cervical spondylosis in young Sudanese adults. It highlights a growing musculoskeletal public health issue linked to rapid digitalization and extended use of electronic devices.

## CONCLUSION

This study demonstrated a high burden of text neck syndrome symptoms and manifestations suggestive of early cervical spondylosis in young Sudanese people. These findings are closely linked to prolonged use of electronic devices, forward head posture, and inadequate ergonomic awareness. Prolonged screen exposure was associated with exacerbated neck pain intensity, neurological manifestations, and functional limitations. The results demonstrate that cervical musculoskeletal symptoms associated with prolonged digital-device use are increasingly observed among younger adults. The inadequate implementation of preventative ergonomic practices underscores the pressing necessity for public health awareness and ergonomic education. Early preventive measures are vital to mitigate long-term musculoskeletal disabilities linked to extended digital-device usage.

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