



Original Article

Association of Computer, Smartphone, and Television Use with Frequency of Neck Pain Among Young Adults

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ABSTRACT

Background: Neck pain is a highly prevalent and disabling musculoskeletal disorder, affecting 30–50% of the general population annually and contributing substantially to global disability. The rapid rise in computer and handheld digital device use has increased exposure to prolonged static postures and forward head flexion, potentially worsening cervical musculoskeletal strain. Evidence on device-related neck pain among young Indian adults remains limited, particularly in the Maharashtra region.

Objective: To assess the association between electronic device usage patterns, ergonomic factors, and frequency of neck pain among young adults, along with radiological evaluation of cervical lordosis.

Methods: A clinic-based cross-sectional study was conducted in the Orthopedics OPD of Param Orthopedic Clinic. Young adults aged 18–35 years with neck pain at least once monthly for six months and regular electronic device use for ≥ 1 year were enrolled using convenience sampling. A structured questionnaire assessed device type, daily duration, and posture. Lateral cervical radiographs were obtained in a standardized position, and cervical lordosis was measured using the posterior tangent technique. Participants were classified as having less frequent or more frequent neck pain. Associations were tested using Chi-square, and significant variables were entered into logistic regression ($p < 0.05$).

Results: Of 471 participants included, 352 (74.7%) reported less frequent pain and 119 (25.3%) more frequent pain. More frequent neck pain was significantly associated with longer computer use (> 3 hours/day; $p = 0.002$), screen position below eye level ($p < 0.001$), smartphone use ($p = 0.005$), and prolonged television viewing (> 3 hours/day; $p = 0.039$).

Conclusion: Neck pain frequency in young adults is strongly linked to modifiable device-use behaviors and ergonomics. Preventive strategies emphasizing posture correction, optimal screen positioning, and regular breaks are essential.

Keywords: Neck Pain, Digital Device Usage, Ergonomic Risk Factors, Cervical Lordosis, Young Adults.

INTRODUCTION:

Neck pain is one of the most common musculoskeletal complaints worldwide and represents a major cause of disability and reduced quality of life. The 12-month prevalence of neck pain in the general population ranges from 30% to 50%, and nearly 70% of individuals experience cervical pain at some point during their lifetime.^{1,2} Neck pain is typically described as discomfort occurring from the base of the skull (occiput) to the upper thoracic region, and may extend laterally towards the scapular borders.² The Global Burden of Disease study has ranked neck pain among the leading causes of disability globally, emphasizing its significance as a public health concern.¹

The etiology of neck pain is multifactorial and includes postural strain, prolonged static muscle loading, repetitive micro-movements, poor ergonomics, psychosocial stressors, and degenerative spinal changes. Occupational exposure remains an important contributor, especially in individuals involved in desk-based work and prolonged use of visual display units (VDUs).³ Neck pain often follows a chronic or recurrent course, with a considerable proportion of patients experiencing persistent symptoms, recurrence, or gradual worsening over time, leading to functional limitations, work absenteeism, and increased healthcare utilization.^{1,4}

The increasing dependence on computers and digital workstations has substantially altered lifestyle and workplace behavior, promoting prolonged sitting, reduced movement, and fewer restorative breaks.³ Such patterns impose continuous mechanical stress on the cervical spine, particularly through sustained neck flexion or forward head posture. Persistent abnormal posture increases the demand on cervical extensor muscles and surrounding soft tissues, creating a cycle of fatigue and overload. At the cellular level, prolonged mechanical strain may result in micro-trauma to muscle fibers, tendons, and ligaments, leading to local inflammation, ischemia, and accumulation of metabolic by-products. This triggers the release of inflammatory mediators, sensitization of nociceptors, and progressive tissue degeneration. Over time, repeated stress can contribute to muscle imbalance, reduced proprioception, altered cervical biomechanics, and degenerative changes, ultimately manifesting as chronic pain and stiffness.

In addition to computer use, handheld electronic devices such as smartphones, tablets, and gaming devices have become universally prevalent.⁵⁻⁷ Their prolonged use is frequently associated with sustained forward head flexion and rounded shoulder posture. The term “text neck” describes cervical pain and mechanical stress caused by extended neck flexion during handheld device usage.⁸ Biomechanical evidence indicates that forward head flexion significantly increases the effective load on the cervical spine, which may accelerate soft tissue strain and degenerative processes.⁸ If persistent, this may lead to muscle spasm, ligament strain, intervertebral disc stress, altered cervical curvature, and chronic pain syndromes.⁸

Several factors may further increase susceptibility to neck pain among device users, including age, gender, obesity, reduced physical activity, and systemic or hormonal influences.⁴ Additionally, excessive screen time and device dependence may prolong exposure to harmful postures and repetitive strain, increasing the likelihood of developing musculoskeletal disorders due to cumulative overload beyond tissue tolerance.^{7,9}

Given the rapidly rising use of electronic devices across all age groups, neck pain related to prolonged screen exposure has become an emerging and preventable health burden. Early identification of high-risk usage patterns and their musculoskeletal impact is essential for guiding preventive strategies, ergonomic awareness, and timely clinical intervention. Furthermore, Clinico-radiological correlation is valuable to understand whether symptom severity corresponds to structural changes, which can improve diagnosis and management planning. Despite this growing concern, limited evidence is available from India regarding the relationship between electronic device usage and neck pain, and there is a scarcity of region-specific data from Maharashtra and the Marathwada region.^{6,9,10} Therefore, the present study was undertaken to address this gap.

OBJECTIVES OF THE STUDY

1. To assess the prevalence and severity of neck pain among individuals using electronic devices (computers and handheld devices).
2. To evaluate patterns of electronic device use, including duration, frequency, posture, and associated ergonomic practices.
3. To determine the association between device usage characteristics and neck pain, and identify major contributing risk factors.
4. To correlate clinical findings with radiological changes of the cervical spine, wherever applicable, to assess structural involvement.

MATERIALS AND METHODS

This clinic-based cross-sectional study was conducted between November 2023 and October 2025 in the Orthopedics Outpatient Department, Param Orthopedic Clinic. The study population included young adults aged 18–35 years who attended the orthopedics outpatient clinic with complaints of neck pain.

Participants were enrolled based on predefined inclusion criteria. Adults of either gender between 18 and 35 years were included if they reported neck pain occurring at least once a month during the preceding six months. In addition, participants were required to have a history of regular use of electronic devices such as mobile phones, tablets, computers, or television for at least one year, and/or occupational computer use for a minimum of 3 hours per day or 15 hours per week in their current job for at least six months.

Participants were excluded if their neck pain was attributable to trauma or infectious etiology, or if they had a past history of neck pain secondary to trauma or infection. Individuals with congenital deformities involving the neck, shoulder, or upper extremity were also excluded. Further, participants with a history of motor vehicle use exceeding two hours daily or travel of more than 40 km per day were excluded, as prolonged travel may act as a confounding factor for neck pain.^{11,12} The sample size was calculated based on a previously reported prevalence of neck and shoulder pain of 40% among electronic device users.¹³ The sample size was estimated using the formula $N = (Z^2 P(1 - P))/D^2$, where $P = 0.40$, $Z = 1.96$ at a 95% confidence level, and $D = 0.04$ as the absolute precision. The minimum required sample size was determined to be 369 participants.

A convenience sampling method was used, and consecutive patients meeting the inclusion criteria were recruited until the target sample size was achieved. After obtaining written informed consent, all participants were interviewed in detail regarding the history of neck pain and any associated musculoskeletal or systemic symptoms. Information related to the type of electronic devices used and the duration of daily usage, including computers, mobile phones, tablets, and television, was collected using a structured questionnaire adapted from the studies by Shan et al.¹⁴ and Hakala et al.¹⁵

A thorough physical examination was performed for each participant, and findings were documented in a predesigned patient record sheet. Data collection and clinical recording were carried out by the principal investigator to ensure uniformity and reduce inter-observer variation.

Radiological assessment was performed using a lateral (sagittal) radiograph of the cervical spine, taken with the participant in a standing position. The X-ray beam was centered 15 cm below the external auditory meatus at a distance of 150 cm from the film plate. To standardize head posture, the head was maintained at an angle of 20°, defined by the line joining the external auditory meatus and the angle of the eye. Cervical lordosis was measured using the posterior tangent technique.^{16,17} In this method, a straight line (Line A) was drawn from the superior posterior aspect of the odontoid process of the second cervical vertebra (C2) to the posterior inferior aspect of the body of the seventh cervical vertebra (C7). A second line (Line B) was drawn along the posterior margins of the intervening cervical vertebral bodies. A third line (Line C) was drawn perpendicular to Line A at the point of maximum distance between Lines A and B. A value of zero indicated complete loss or flattening of cervical lordosis, positive values represented the degree of lordosis, and negative values indicated reversal of the cervical curvature. This technique was selected due to its improved landmark visibility and better reproducibility on standard lateral cervical spine radiographs.¹⁸

All collected data were initially entered into Microsoft Excel and subsequently analyzed using the Statistical Package for the Social Sciences (IBM Corp. Released 2015, IBM SPSS Statistics for Windows, Version 23.0, Armonk, NY, USA). Descriptive statistics were used to summarize demographic characteristics, device usage patterns, and clinical parameters. Participants were categorized into two groups based on the frequency of neck pain: less frequent neck pain (pain occurring once a month or once a week) and more frequent neck pain (pain occurring 2–3 times per week or more than 3 times per week). Group comparisons were performed using the Chi-square test. Variables showing statistically significant differences between the groups were further included in a multiple logistic regression model to identify independent predictors associated with increased frequency of neck pain. A p value of <0.05 was considered statistically significant at a 95% confidence interval.

RESULTS:

A total of 700 patients presenting to the orthopedics outpatient department with complaints of neck pain were initially screened for eligibility. Of these, 550 patients met the preliminary inclusion criteria 79 patients were excluded due to pathological findings on cervical spine radiographs that did not meet the study criteria, and patients declined to undergo radiological evaluation. Consequently, a final sample of 471 patients was included in the study.

Table No.1: Demographic characteristics and physical activity profile of the study participants.

Demographic characteristics		Less Frequent Pain (352)	More Frequent Pain (119)	Total (n = 471)	P value
Gender	Male	166 (47.2%)	60 (50.4%)	226 (48.0%)	0.538
	Female	186 (52.8%)	59 (49.6%)	245 (52.0%)	
Age	18 – 25 years	99 (28.1%)	34 (28.6%)	133 (28.2%)	0.925
	26 – 35 years	253 (71.9%)	85 (71.4%)	338 (71.8%)	
Hand dominance	Right	295 (83.8%)	97 (81.5%)	392 (83.2%)	0.563
	Left	57 (16.2%)	22 (18.5%)	79 (16.8%)	
Education	Higher Secondary School	153 (43.5%)	57 (47.9%)	210 (44.6%)	0.089
	Graduate	133 (37.8%)	50 (42.0%)	183 (38.9%)	
	Post graduate	66 (18.8%)	12 (10.1%)	78 (16.6%)	
Physical activity	Light	112 (31.8%)	32 (26.9%)	144 (30.6%)	0.454
	Moderate	214 (60.8%)	75 (63.0%)	289 (61.4%)	
	Heavy	26 (7.4%)	12 (10.1%)	38 (8.1%)	
Exercise frequency	Once a week	89 (25.3%)	23 (19.3%)	112 (23.8%)	0.003
	1 – 4 times	51 (14.5%)	25 (21.0%)	76 (16.1%)	
	5 – 7 times	200 (56.8%)	58 (48.7%)	258 (54.8%)	
	More than 7 times	12 (3.4%)	13 (10.9%)	25 (5.3%)	
Exercise duration per day	30 mins	100 (28.4%)	29 (24.4%)	129 (27.4%)	0.571
	30 mins to 1 hour	59 (16.8%)	24 (20.2%)	83 (17.6%)	
	1 – 2 hours	193 (55.1%)	66 (55.5%)	259 (55.0%)	

The demographic and lifestyle characteristics of participants stratified by frequency of neck pain are presented in Table X. Of the total 471 participants, 352 (74.7%) reported less frequent neck pain, while 119 (25.3%) experienced more frequent neck pain.

There was no statistically significant difference in gender distribution between the two groups ($p = 0.538$). Males constituted 47.2% of the less frequent pain group and 50.4% of the more frequent pain group, while females accounted for 52.8% and 49.6% of the respective groups.

The majority of participants belonged to the 26–35 years age group (71.8%), with similar proportions observed in both less frequent (71.9%) and more frequent pain groups (71.4%). Participants aged 18–25 years constituted approximately 28% of the study population. No significant association was observed between age and frequency of neck pain ($p = 0.925$).

Right-hand dominance was predominant in the study population (83.2%) and was similarly distributed between participants with less frequent pain (83.8%) and more frequent pain (81.5%). Left-hand dominance showed no meaningful variation between the two groups. The difference between right- and left-hand dominance across pain frequency groups was not statistically significant ($p = 0.563$).

With respect to educational status, higher secondary education was the most common level attained in both groups, followed by graduation. Postgraduate education was more frequently observed among participants with less frequent pain (18.8%) compared to those with more frequent pain (10.1%).

Regarding physical activity levels, the majority of participants reported moderate physical activity (61.4%), with comparable proportions in both less frequent (60.8%) and more frequent pain groups (63.0%). Light physical activity was slightly more common in the less frequent pain group, while heavy physical activity was marginally higher among participants with more frequent pain. No statistically significant association was found between physical activity level and frequency of neck pain ($p = 0.454$).

In contrast, exercise frequency demonstrated a statistically significant difference between the two groups ($p = 0.003$). Exercise frequency demonstrated some variation between groups. Participants exercising 5–7 times per week constituted the largest proportion in both groups; however, a higher proportion of individuals with more frequent pain reported exercising more than seven times per week (10.9%) compared to those with less frequent pain (3.4%). Conversely, exercising once a week was more common in the less frequent pain group.

Exercise duration per day was similar across both groups, with over half of the participants in each group engaging in physical activity for 1–2 hours per day. Shorter exercise durations (≤ 1 hour per day) were comparably distributed between groups. Exercise duration per day did not show a statistically significant difference between the two groups ($p = 0.571$).

Table No. 2: Distribution of computer usage patterns and workstation characteristics among participants.

		Less Frequent Pain (n = 251)	More Frequent Pain (n = 66)	Total (n = 317)	P value
Time spent on PC (pr day)	Up to 1 hour	35 (13.9%)	4 (6.1%)	39 (12.3%)	0.002
	1 – 2 hours	23 (9.2%)	8 (12.1%)	31 (9.8%)	
	2 – 3 hours	139 (55.4%)	26 (39.4%)	165 (52.1%)	
	More than 3 hours	54 (21.5%)	28 (42.4%)	82 (25.9%)	
Type of Computer	Desktop	156 (62.2%)	47 (71.2%)	203 (64.0%)	0.393
	Laptop	29 (11.6%)	6 (9.1%)	35 (11.0%)	
	Both	66 (26.3%)	13 (19.7%)	79 (24.9%)	
Hight of PC	Eyes below Midpoint of Screen	19 (7.6%)	37 (56.1%)	56 (17.7%)	<0.001
	Eyes at Midpoint of screen	84 (33.5%)	25 (37.9%)	109 (34.4%)	
	Eyes above the Midpoint of screen	148 (59.0%)	4 (6.1%)	152 (47.9%)	
Eyes to screen distance for PC	Less than 45 CM	14 (5.8%)	4 (6.1%)	18 (5.7%)	0.683
	45 – 60 CM	67 (26.7%)	21 (31.8%)	88 (27.8%)	
	More than 60 CM	170 (67.7%)	41 (62.1%)	211 (66.6%)	

Table 2 summarizes computer usage patterns and workstation characteristics among participants with less frequent and more frequent neck pain. A total of 317 participants who reported regular computer use were included in this analysis, of whom 251 (79.2%) experienced less frequent neck pain and 66 (20.8%) reported more frequent neck pain.

A statistically significant association was observed between time spent on the computer per day and frequency of pain ($p = 0.002$). Participants with more frequent pain reported longer durations of computer use, with 42.4% using a computer for

more than 3 hours per day compared to 21.5% among those with less frequent pain. Conversely, shorter durations of computer use (up to 1 hour per day) were more common in the less frequent pain group (13.9%) than in the more frequent pain group (6.1%).

No statistically significant association was found between type of computer used (desktop, laptop, or both) and pain frequency ($p = 0.393$), indicating that the type of device alone did not influence pain occurrence.

A highly significant association was noted between height of the computer screen relative to eye level and pain frequency ($p < 0.001$). More than half of participants with more frequent pain (56.1%) had their eyes positioned below the midpoint of the screen, compared to only 7.6% in the less frequent pain group. In contrast, positioning the eyes above the midpoint of the screen was predominantly observed among participants with less frequent pain (59.0%).

No significant association was observed between eye-to-screen distance and pain frequency ($p = 0.683$), as similar distributions of viewing distance were noted across both pain groups.

Table No. 3: Relationship between handheld digital device (HHD) characteristics, usage patterns, posture, and frequency of pain among the study participants.

		Less Frequent Pain (n = 352)	More Frequent Pain (n = 119)	Total	P value
Type of HHDs	Ordinary Mobile Phone	150 (42.6%)	42 (35.3%)	192 (40.3%)	0.162
	I Phone	29 (8.2%)	8 (6.7%)	37 (7.9%)	0.596
	Tablet	36 (10.2%)	13 (10.9%)	49 (10.4%)	0.826
	Smartphone	295 (83.8%)	112 (94.1%)	407 (86.4%)	0.005
	Gaming Device	88 (25.0%)	40 (33.6%)	128 (27.2%)	0.067
Usage of HHDs	Oral Communication	265 (75.3%)	99 (83.2%)	364 (77.3%)	0.075
	E mail	87 (24.7%)	23 (19.3%)	110 (23.4%)	0.230
	Internet Surfing	100 (28.4%)	35 (29.4%)	135 (28.7%)	0.834
	Text Messages	316 (89.8%)	110 (92.4%)	426 (90.4%)	0.395
	Games	206 (58.5%)	80 (67.2%)	286 (60.7%)	0.093
	Social Networking	289 (82.1%)	106 (89.1%)	395 (83.9%)	0.073
Posture while using HHDs	Standing	93 (26.4%)	27 (22.7%)	120 (25.5%)	0.418
	Semi Reclining	182 (51.7%)	62 (52.1%)	244 (51.8%)	0.944
	Lying	150 (42.6%)	63 (52.9%)	213 (45.2%)	0.050
	Sitting	328 (93.2%)	116 (97.5%)	444 (94.3%)	0.082
Time spent on HHDs	Up to 1 hour	13 (3.7%)	2 (1.7%)	15 (3.2%)	0.266
	1 – 2 hours	6 (1.7%)	2 (1.7%)	8 (1.7%)	
	2 – 3 hours	42 (11.9%)	8 (6.7%)	50 (10.6%)	
	More than 3 hours	291 (82.7%)	107 (89.9%)	398 (84.5%)	

Table 3 depicts the relationship between handheld digital device (HHD) characteristics, usage patterns, posture, and frequency of pain among the study participants.

With respect to the type of HHDs used, a statistically significant association was observed only for smartphone usage ($p = 0.005$). Smartphone use was significantly more common among participants with more frequent pain (94.1%) compared to those with less frequent pain (83.8%). No significant association was found between pain frequency and the use of ordinary mobile phones, iPhones, tablets, or gaming devices.

Regarding usage of HHDs, no statistically significant association was observed between pain frequency and specific purposes such as oral communication, e-mail, internet surfing, text messaging, games, or social networking (all $p > 0.05$),

although higher proportions of participants with more frequent pain reported use for oral communication, gaming, and social networking.

Analysis of posture while using HHDs showed a borderline significant association for the lying posture ($p = 0.050$), which was more prevalent among participants with more frequent pain (52.9%) compared to those with less frequent pain (42.6%). No significant associations were noted for standing, semi-reclining, or sitting postures.

With regard to time spent on HHDs, the majority of participants in both groups reported usage of more than 3 hours per day. Although a higher proportion of participants with more frequent pain (89.9%) reported prolonged usage compared to those with less frequent pain (82.7%), this association did not reach statistical significance ($p = 0.266$).

Table No 4.

Television		Less Frequent Pain (n = 352)	More Frequent Pain (n = 119)	Total (n = 471)	P value
Time spent on TV	Less than 1 hours	34 (9.7%)	14 (11.8%)	48 (10.2%)	0.039
	1 – 2 hours	14 (4.0%)	4 (3.4%)	18 (3.8%)	
	2 – 3 hours	61 (17.3%)	8 (6.7%)	69 (14.6%)	
	More than 3 hours	243 (69.0%)	93 (78.2%)	336 (71.3%)	

The table 4 shows a statistically significant association between time spent watching television and frequency of pain ($p = 0.039$). Participants with more frequent pain were more likely to spend more than 3 hours per day watching television (78.2%) compared to those with less frequent pain (69.0%). Conversely, spending 2–3 hours per day watching television was more common among participants with less frequent pain (17.3%) than those with more frequent pain (6.7%). No substantial differences were observed for television viewing durations of less than 2 hours per day between the two groups.

Discussion: This cross-sectional study was conducted in the Orthopedics Out-Patient Department, Param Orthopedic Clinic. The study included young adults of both genders aged 18–35 years who attended the OPD with complaints of neck pain and reported regular use of electronic devices such as mobile phones, tablets, computers, or television for at least one hour per day over a minimum duration of one year. Participants were recruited using convenience sampling. Data were collected by the principal investigator through direct interviews using a structured patient record sheet.

In the present study, no statistically significant difference was observed in the frequency of neck pain complaints between males and females (Tables 1). This finding contrasts with several previous studies that have reported a higher prevalence of neck pain among females.^{14, 15, 19-24} The higher incidence of neck pain in women reported in the literature has been attributed to multiple biological, occupational, and psychosocial factors. Men are known to have a higher pain threshold compared to women, which may partly explain this disparity.¹⁴ Furthermore, women often perform tasks with different physical demands and work organization than men, including a greater proportion of repetitive work and prolonged sitting.¹⁹ Additional contributory factors include increased mental stress, dual burden of paid and unpaid work such as household chores and childcare, hormonal variations, lower levels of physical activity, and reduced bone mineral density.^{14, 19, 25} Ergonomic mismatches at workplaces, which are often designed based on male anthropometry, may further subject women to greater biomechanical stress during similar tasks.²⁶ Although males may exhibit greater head and neck flexion due to taller stature, females are at higher risk of pain because of increased pain sensitivity.²⁶ However, contrary findings have also been reported, with Ardahan and Simsek²³ demonstrating greater susceptibility to neck, shoulder, and back pain among males.

No significant association was observed between neck pain and age groups 18–25 years and 26–35 years in the present study ($p = 0.876$; Tables 1). This finding differs from the systematic review by Green et al.,³ which reported that neck pain was twice as common in individuals above 30 years of age compared to younger individuals. The absence of such an association in our study may be explained by socio-demographic differences and the relatively homogeneous age range of the study population. Similarly, Shah and Patel⁹ reported a significant association between neck pain and increasing age; however, their study included computer users across a wider age spectrum, including individuals above 50 years, where age-related degenerative and occupational factors could have contributed to neck pain.

Our study demonstrated a significant association between neck pain and lower educational levels (<12th grade) as well as among students pursuing graduation. These findings are consistent with studies by Sim et al.²⁷ and Shan et al.¹⁴ Lower educational status is often associated with physically demanding occupations that impose greater strain on the musculoskeletal system.²⁷ Among students, increased use of multiple digital devices, prolonged screen time, academic stress, psychological pressure, sedentary behavior, and reduced physical activity may predispose them to neck pain.¹⁴

With respect to physical activity, no significant association was found between neck pain and the level of physical activity (mild, moderate, or vigorous) or duration of exercise per day. However, a statistically significant association was observed

with increased frequency of exercise (5–7 times per week; $p = 0.012$; Table 1). This observation aligns with the findings of Silva et al.²⁸ While regular physical activity is known to reduce work-related musculoskeletal disorders by improving body composition, muscle strength, and overall work performance, excessive or frequent exercise without adequate rest may predispose individuals to musculoskeletal strain and microtrauma.²⁸ Adequate rest periods are essential for muscle recovery and clearance of metabolic and algic substances. Madeleine et al.²⁹ also reported no correlation between pain and physical activity among office workers, possibly due to overestimation or uneven distribution of leisure-time physical activity. Similarly, Diepenmaat et al.³⁰ found no association between neck pain and physical activity in adolescents, where psychosocial stressors were the predominant contributors. In contrast, Shan et al.¹⁴ reported a protective effect of exercise against neck pain, which may not have been evident in our study due to irregular exercise patterns or over-reporting of activity levels by participants.

A significant association was observed between neck pain and prolonged computer use ($p = 0.001$; Table 2), a finding consistent with several earlier studies.^{20,28} However, Kaliniene et al.²¹ reported no significant relationship between duration of computer work and frequency of musculoskeletal complaints. Similarly, Madeleine et al.²⁹ found no correlation between computer use and musculoskeletal pain in a questionnaire-based study involving office workers, suggesting a complex interaction between individual, occupational, and psychosocial factors. Studies by Shan et al.¹⁴ and Diepenmaat et al.³⁰, conducted among adolescents, also failed to demonstrate a relationship between computer use duration and neck pain, possibly due to the predominance of psychosocial stressors in younger populations.

In the present study, neck pain was reported more frequently with increasing duration of computer use ($p = 0.001$) and among individuals who used computers continuously for more than 1.5 hours without breaks ($p = 0.030$; Table 2). These findings are in agreement with previous studies demonstrating an association between prolonged screen-based activities and neck or shoulder pain in both genders. Celik et al.³¹ identified uninterrupted computer use for more than two hours as a major risk factor for neck pain, while Ardahan and Simsek²³ reported increased musculoskeletal pain in the neck, shoulders, and back with computer use exceeding three hours without breaks. Kaliniene et al.¹⁵ similarly observed a higher prevalence of musculoskeletal complaints among individuals who worked continuously on computers for more than two hours without rest.

CONCLUSION:

The present clinic-based cross-sectional study highlights the significant burden of neck pain among young adults aged 18–35 years and its strong association with prolonged use of electronic devices. While demographic factors such as age, gender, hand dominance, physical activity level, and exercise duration did not show a significant relationship with the frequency of neck pain, certain modifiable behavioral and ergonomic factors emerged as important determinants.

Prolonged duration of computer use, particularly usage exceeding three hours per day and continuous use without adequate breaks, was significantly associated with more frequent neck pain. In addition, improper workstation ergonomics—specifically positioning of the computer screen below eye level—was strongly linked to increased pain frequency. Among handheld digital devices, smartphone use showed a significant association with more frequent neck pain, and a lying posture during device use demonstrated a borderline significant relationship. Extended television viewing time, especially beyond three hours per day, was also significantly associated with increased pain frequency.

These findings suggest that neck pain in young adults is more closely related to patterns of device usage, posture, and ergonomic factors rather than inherent demographic characteristics. Given the widespread and increasing dependence on electronic devices, early identification of at-risk behaviors and implementation of preventive strategies—such as ergonomic education, appropriate screen positioning, regular breaks, posture correction, and rational limitation of screen time are essential.

REFERENCES:

1. Yeun RY, Han SJ. Factors associated with neck/shoulder pain in young adults. *Biomed Res India* 2017;28:7117-21.
2. Gulraiz, Quratulain, Afzal F, Manzoor S. Chronic neck pain and how to prevent chronic pain in bankers by using ergonomics. *J Nov Physiother* 2017;7:5
3. Green BN. A literature review of neck pain associated with computer use: public health implications. *J Can Chiropr Assoc* 2008;52:161-168.
4. Ming Z, Narhi M, Siivola J. Neck and shoulder pain related to computer use. *Pathophysiology* 2004;11:51-56
5. Sharan D, Mohandoss M, Rangnathan R, Jose J. Musculoskeletal disorders of the upper extremities due to extensive usage of hand held devices. *Ann Occup Environ Med* 2014;26:22.
6. Stalin P, Abraham SB, Kanimozhy K, Vishnu Prasad R, Singh Z, Purty AJ. Mobile phone usage and its health effects among adults in a semi-urban area of Southern-India. *Journal of clinical and diagnostic research* 2016;10:LC14-LC-165.
7. Balakrishnan R, Chinnavan E, Feii T. An extensive usage of hand held devices will lead to musculoskeletal disorder of upper extremity among student in AMU. A survey method. *International Journal of Physical Education, Sports and Health* 2016;3:368-72.

8. Neuane S, Iftikhar Ali UT, Mathew A. Text Neck Syndrome-Systematic Review . *Imperial Journal of Interdisciplinary* 2017;7:141-148.
9. Shah SA, Patel PR. Prevalence of neck pain in computer operators. *NHL Journal of Medical Sciences* 2015;4:5-10.
10. Eapen C, Kumar B, Bhat A. Prevalence of cumulative trauma disorders in cell phone users. *J. Musculoskelet. Res* 2010;13:137.
11. Milosavljevic S, Bagheri N, Vasiljev RM, Mc Bride DI, Rehn B. Does daily exposure to whole-body vibration and mechanical shock relate to the prevalence of low back and neck pain in a rural workforce? *Ann Occup Hyg.* 2012;56:10-17.
12. Ramasamy S, Adalarasu K, Patel T N. Evaluation of driving –related musculoskeletal disorders in motor-bike riders using Quick Exposure Check (QEC) *Biomed Res India* 2017;28:1962-1968.
13. Goyal RC. Research methodology for health professionals including proposal, thesis and article writing. New Delhi: Jaypee brothers Medical Publishers. 1st edition. 2013.
14. Shan Z, Deng G, Li J, Li Y, Zhang Y, Zhao Q. Correlational analysis of neck/ shoulder pain and low back pain with use of digital products, physical activity and psychological status among adolescents in Shanghai. *PLoS ONE* 2013;8:e78109.
15. Hakala PT, Rimpela AH, Saarni LA, Salminen JJ. Frequent computer – related activities increase the risk of neck-shoulder and low back pain in adolescents. *Eur J Public Health*;16:536-541.
16. Grob D, Frauenfelder H, Mannion AF. The association between cervical spine curvature and neck pain. *Eur Spine J.* 2007;16:699-78.
17. Kumagai G, Ono A, Numasawa T, Wada K, Inoue R, Iwasaki H, et al. Association between roentgenographic findings of the cervical spine and neck symptoms in a Japanese community population. *J Orthop Sci* 2014;19:390-97.
18. Borden A G B, Rechtman AM, Gershon –Cohen. The Normal Cervical Lordosis. *Radiology*, 1960; 74.
19. Eltayeb S, Staal JB, Kennes J, Lamberts PHG, de Bie A. Prevalence of complaints of arm, neck and shoulder among office workers and psychometric evaluation of a risk factor questionnaire. *BMC Musculoskelet Disord* 2007;8:68.
20. Shabbir M, Rashid S, Umar B, Ahmad A, Ehsan S. Frequency of neck and shoulder pain and use of adjustable computer workstation among bankers. *Pak Med Sci* 2016;32:423-426.
21. Kaliniene G, Ustinaviciene R, Skemiene L, Januskevicius V. Associations between neck musculoskeletal complaints and work related factors among public service computer workers in Kaunas. *Int J Occup Med Environ Health* 2013;26:670-681
22. Ranasinghe P, Perera Y S, Lambadusuriya DA, Kulatunga S, Jayawardana N, Rajapakse S et al. Work related complaints of neck, shoulder and arm along computer office workers: a cross-sectional evaluation of prevalence and risk factors in a developing country. *Environ Health* 2011;10:70.
23. Ardahan M, Simsek H. Analyzing musculoskeletal system discomforts and risk factors in computer-using office workers. *Pak J Med Sci* 2016;32:1425-29.
24. Wijnhoven H A H, de Vet HCW, Picavet SJ. Prevalence of musculoskeletal disorders is systematically higher in women than in men. *Clin J Pain* 2006;22:717-24.
25. Ye S, Jing Q, Wei C, Lu Jie. Risk factors of non –specific neck pain and low back pain in computer using office workers in Chin :A cross-sectional study. *BMJ Open* 2017;7:e014914. 30|Sharan D, Ajeesh PS. Risk factors and clinical features of text message injuries. *Work* 2012;41:1145-48.
26. Toh SH, Coenen P, Howie E K, Straker LM. The associations of mobile touch screen device use with musculoskeletal symptoms and exposures: A systematic review. *PLoS ONE* 2017;12:e0181220.
27. Sim J, Lacey RJ, Lewis M. The impact of workplace risk factors on the occurrence of neck and upper limb pain: a general population study. *BMC Public Health* 2006;6:234.
28. Silva AG, Sa-Couto P, Queiros A, Neto M, Rocha N. Pain, pain intensity and pain disability in high school students are differently associated with physical activity, screening hours and sleep. *BMC Musculoskeletal disorders* 2017;12:194.
29. Madeleine P, Vangsgaard S, Andersen JH, Ge HY, Arendt-Nielson. Computer work and self –reported variables on anthropometrics, computer usage, work ability, productivity, pain and physical activity. *BMC Musculoskeletal disorders* 2013;14:26.
30. Diepenmaat ACM, van der Wal MF, de Vet, Hirasing RA. Neck/ shoulder, low back, and arm pain in relation to computer use, physical activity, stress and depression among Dutch adolescents. *Pediatrics* 2006;117.
31. Celik S, Celik K, Dirimise E, Tasdemir N, Arik T, Buyukkara I. Determination of pain in musculoskeletal system reported by office workers and the pain risk factors. *Int J Occup Med Environ Health* 2018;31:91-111.