



ORIGINAL ARTICLE

Correlation of Upper Cross Syndrome with prolonged sitting among it workers in Lahore.

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ABSTRACT... Objective: To find out the correlation between upper cross syndrome and prolong sitting among IT workers of Lahore. **Study Design:** Cross Sectional Study. **Setting:** The data will be collected from different IT Companies in Lahore such as Wateen Telecom Limited Arfa Karim Technology Incubator. **Period:** July 2024 to December 2024. **Methods:** In this study, 278 IT professionals both males and females were included through non probability convenient sampling technique. REEDCO Posture Assessment Scale was used to assess the posture of IT workers and data were collected. REEDCO scale was used to analyze the proper alignment of head, shoulder, neck and upper back. The collected data was subjected to statistical analysis version 2021 using appropriate method to explore relationships and differences between the variables of interest. **Results:** The occurrence of upper cross syndrome was significant with the $p < 0.000$ value. Out of 278 participants, 50.7% had poor posture, 30.2% had fair posture and 19.1% had good posture. Current study shows that females were more prone to Upper Cross Syndrome as compared to man. **Conclusion:** This study reveals significant correlation between upper cross syndrome and prolong sitting among IT workers in Lahore. It is found that underweight and overweight individuals are more prone to develop upper cross syndrome than the individuals with normal BMI.

Key words: Bad Postural Habit, Forward Head Posture, Prolonged Sitting, Upper Cross Syndrome.

INTRODUCTION

Upper crossing syndrome (UCS) is marked by weakness and tightness in the muscle of neck, shoulders, and upper back that cross between the dorsal and ventral sides of the body. Upper Crossed Syndrome is the main postural deviation (UCS). Bad body posture can result from a mix of external circumstances and physical components, such as inadequate ergonomics when working or using a computer.¹

This typical postural dysfunctional pattern in the upper torso is brought about by muscle imbalance. Muscle imbalance includes rigidity and hyperexcitation of the elevator scapulae, pectoralis major, and upper trapezius muscles, in addition to weakness and suppression of the serratus anterior and deep neck flexors, especially the scalene, middle trapezius, lower trapezius, and rhomboids muscles.²

Adults were sitting with bad posture throughout exams and classes. Muscular imbalance results from prolonged incorrect posture. The change in upper back posture is brought on by a muscle imbalance. UCS develops by pressure and stress on the upper back caused by poor posture and ergonomics. Numerous studies indicate that people who labor for more than four hours a day are more likely to develop from upper cross syndrome.³

The main root cause of the condition is extended standing and sitting with slouch posture and disrupted biomechanics. Short neck flexors and longer neck extensors are the result of a disturbance in the muscular balance system. The musculoskeletal tissues surrounding the upper back experience constant stress due to the muscle asymmetry, which can extend down the spine. Overuse of incorrect stances and inadequately

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designed sitting chairs are uncomfortable and contribute to the increase of WRMSs.⁴

According to WHO literature, using a mobile phone while supine lying, operating a computer at an incorrect angle, and watching television with the neck extended are some of the fundamental variables that lead to UCS, which is the most prevalent cause of impairment among people aged 20-50. It is mostly linked to their jobs, with headaches and chronic neck pain being the most frequent complaints worldwide.⁵

The range of UCS incidence is 11–60%. over the world in a variety of cultures and age groups ranging from 20-50. This condition has several causes and impacts the upper portion of the body. Repeated actions and biomechanical, psychological, and social stressors can cause musculoskeletal problems over time. The right body for the treatment of UCS, posture and varied physical therapy exercises are advantageous.⁶

Women have a greater possibility to have upper cross syndrome than men, and its prevalence is higher in high- income countries than in low- and middle-income ones, as well as in metropolitan regions than in rural ones. One of the most common ailments is upper cross syndrome. It has been observed that 32.4% of workers, 24.3% of drivers, and 27% of housewives suffer with upper-crossed syndrome.⁷

One of the most prevalent conditions affecting the upper body is upper cross syndrome, which accounts for 45–65% of shoulder pain. According to reports, roughly 21% of people in general have shoulder pain, 40% of which lasts for a year, and the annual cost of shoulder pain is \$39. The great majority of people in today's world suffer from diseases brought on by poor muscular use and bad posture.⁸

According to studies, 67% of IT workers suffer from Upper Cross Syndrome. IT workers should cut back on their periods of sitting because they can develop faulty posture from spending too much time in one spot. They continue to work longer hours than they usually do, which causes

them to feel agony and discomfort. But there was never a conversation of the association between UCS and extended sitting.⁹

METHODS

This cross-sectional study was done during July 2024 to December 2024 after the approval of the ethical committee (Reference No: USA-RW/DR/2023/04/064 Dated: 30/06/2024).at different IT Companies of Lahore. The Protocol was approved by the Ethical Review Committee of the institute. The data was collected using non-probability convenient sampling technique. Specific age group from 22-40 years belonging to the department of Information Technology was sought out for the data collection procedure and verbal consent was obtained after they were fully informed.

In this study, 278 IT professionals both males and females were included through non- probability convenient sampling technique. The participants who match the inclusion criteria was included in the study while the participants who do not belong to inclusion criteria were discarded. Demographic information, academic standing, device ownership, and prior upper posture related concerns was gathered through a survey. REEDCO Posture Assessment Scale was used to assess the posture of IT workers and data were collected. REEDCO scale was used to analyze the proper alignment of head, shoulder, neck and upper back.

All the obtained data was kept confidential. And all ethical standards were maintained and kept. The collected data was subjected to statistical analysis version 2021 using appropriate method to explore relationships and differences between the variables of interest. This comprehensive approach was facilitated a detailed examination of the study's research questions and objectives.

RESULTS

A total 278 participants recruited in this study with 49.3% (n=137) males and 50.7% (n=141) females. Age 22-31 years were 100 (36%) and participants 178(64%) were between 31 to 40

years. The higher number of participants who worked for more than 8 hours had percentage 54.5% and participants who worked for less than 8 hours had percentage 45.3%.

A higher proportion of participants of 5-8 professional years had percentage 62.6% and lower proportion of participants of 2-5 professional years had percentage 37.4%. Normal weight participants were 123 (44.2%), overweight participants were 87 (31.3%) and underweight participants were 68 (24.5%).

The participants with REEDCO fair posture of head left/right had percentage 53.6%, participants with poor head posture left/right had percentage 32.7% and participants with good head posture left/right had percentage 13.7%. The participants with fair shoulder posture left/right had percentage 60.4%, participants with poor shoulder posture left/right had percentage 26.6% and participants with good shoulder left/right posture had percentage 12.9%. The participants with fair neck posture were 70.9%, participants with poor neck posture were 17.6% and participants with good neck posture were 11.5%. The participants with fair upper back posture were 46.4%, participants with poor neck posture were 39.2% and participants with good neck posture were 14.4%.

The occurrence of upper cross syndrome was significant with the $p < 0.000$ value. Out of 278 participants, 50.7% had poor posture, 30.2% had fair posture and 19.1% had good posture. The age distribution data reveals a predominantly middle aged adults sample, with the highest proportion aged 31-40 years, having percentage 64% and lowest proportion aged 22-31 years, having percentage 36%.

The BMI distribution data reveals a highest proportion of normal weight participants, having percentage 44.2%, a middle proportion of overweight participants, having percentage

31.3% and lesser proportion of underweight participants, having percentage 24.5%.

The Figure-1 reveals a higher proportion of participants with fair head left/right, having percentage 53.6%, and middle proportion of participants with poor head left/right, having percentage 32.7% and lesser proportion of participants with good head left/right having percentage 13.7%.

The Figure-2 illustrates the frequency, percentage, mean and standard deviation, shoulder left/right distribution within sample of population. The figure 2 reveals a higher proportion of participants with fair shoulder left/right, having percentage 60.4%, middle proportion of participants with poor shoulder left/right, having percentage 26.6% and lesser proportion of participants with good shoulder left/right, having percentage 12.9%.

The Figure-3 illustrates the frequency, percentage, mean and standard deviation, neck distribution within sample of population. The figure 3 reveals a higher proportion of participants with fair neck, having percentage 70.9%, middle proportion of participants with poor neck, having percentage 17.6% and a lesser proportion of participants with good neck, having percentage 11.5%.

The Figure-4 illustrates the frequency, percentage, mean and standard deviation, upper back distribution within sample of population. The figure 4 reveals a higher proportion of participants with fair upper back, having percentage 46.4%, a middle proportion of participants with poor neck, having percentage 39.2% and a lesser proportion of participants with good neck, having percentage 14.4%.

The Figure-5 illustrates the total reedco score of participants, highest number of participants 0-14 (poor posture) having percentage 50.7%, 15-27 (fair posture) having percentage 30.2% and 28-40 (good posture) having percentage 19.1% respectively.

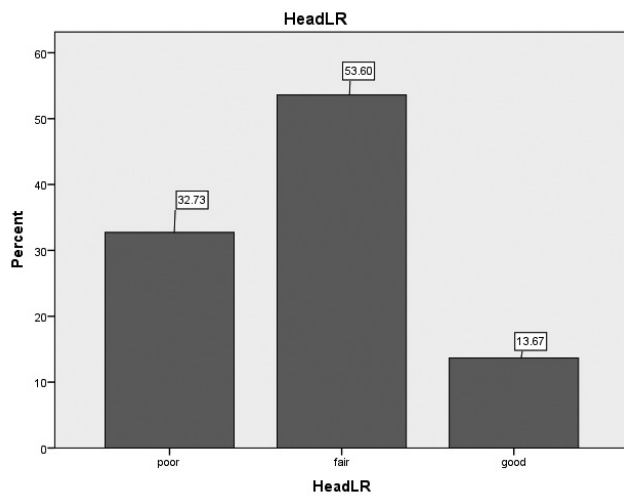


Figure-1. Distribution of head L/R of participants

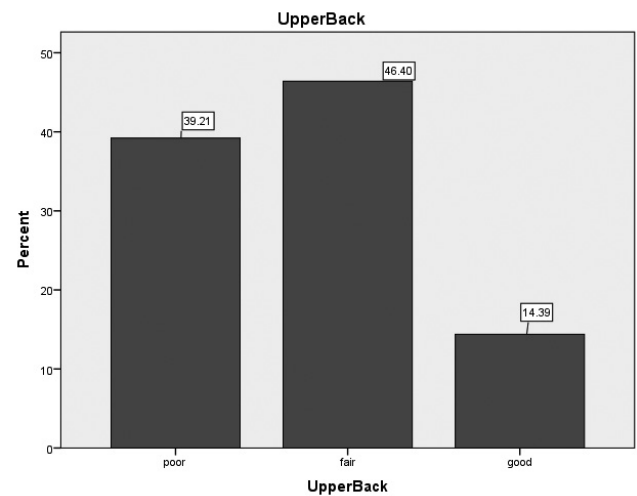


Figure-4. Upper back distribution of participant

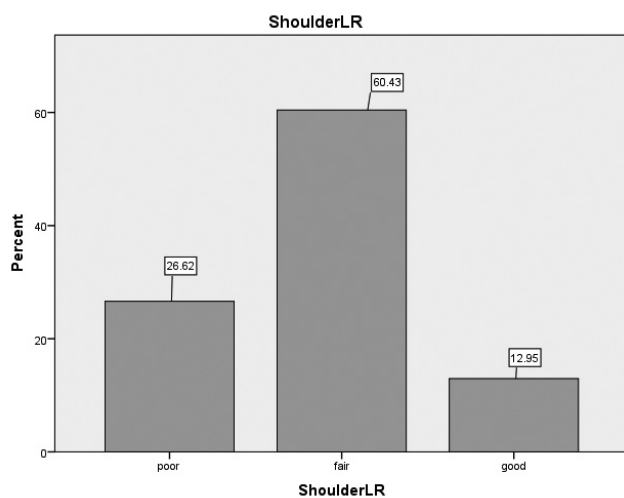


Figure-2. Distribution of shoulder left/right of participants

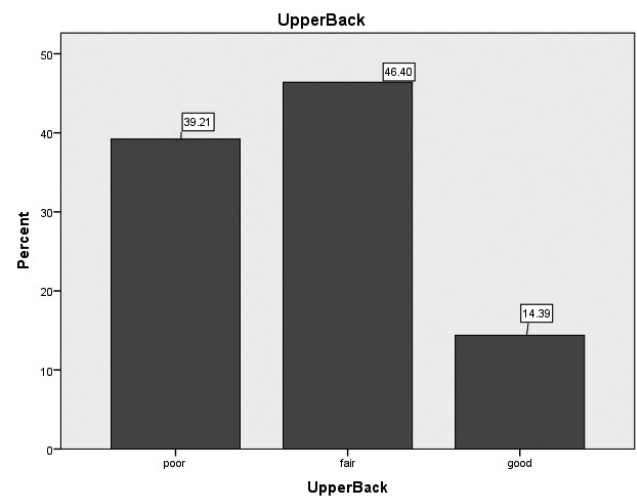


Figure-5. Total reedco scoring of participants

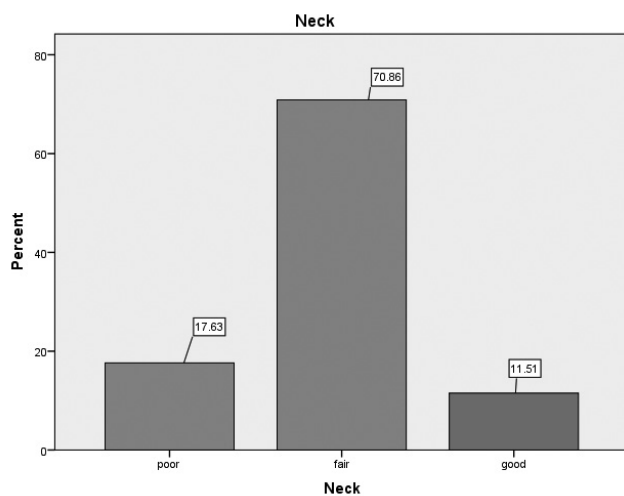


Figure-3. Neck distribution of participants

Table-I illustrates the significant correlation between upper cross syndrome and prolong sitting, BMI, TOTAL REEDCO upper back, head, neck and shoulder posture.

DISCUSSION

Upper cross syndrome is a widespread musculoskeletal disorder caused by poor posture for longer duration, muscular weakness and muscular stiffness. The purpose of the research to determine the association of upper cross syndrome with prolonged sitting among IT workers using REEDCO posture assessment scale.

CORRELATION BETWEEN WORKING HOURS AND TOTAL REEDCO

		Correlations						
		Working hours	BMI	Head LR	Shoulder LR	Neck	Upper Back	Total REEDCO
Working hours	Pearson Correlation	1	-.007	-.099	.042	.019	-.031	.032
	Sig. (2-tailed)		.904	.099	.487	.753	.604	.600
	N		278	278	278	278	278	278
BMI	Pearson Correlation		1	.011	-.020	.008	.002	-.034
	Sig. (2-tailed)			.850	.735	.895	.974	.573
	N			278	278	278	278	278
Head LR	Pearson Correlation			1	-.047	.459**	.318**	.596**
	Sig. (2-tailed)				.435	.000	.000	.000
	N				278	278	278	278
Shoulder LR	Pearson Correlation				1	-.004	.592**	.548**
	Sig. (2-tailed)					.953	.000	.000
	N					278	278	278
Neck	Pearson Correlation					1	.008	.447**
	Sig. (2-tailed)						.900	.000
	N						278	278
Upper Back	Pearson Correlation						1	.717**
	Sig. (2-tailed)							.000
	N							278
Total REEDCO	Pearson Correlation							1
	Sig. (2-tailed)							
	N							

Table-I. Correlation

The IT workers who have more than 2 years of working experience and duration of sitting at least 3-8 hours added in the research. REEDCO assessment scale was used to assess postural abnormality in IT workers. SPSS version 2021 was used for statistical analysis.

According to the current research findings, there is a strong correlation ($p < 0.000$) between upper crossed syndrome and extended sitting. This study reveals that 50.7% participants had poor posture, 30.2% had fair posture and 19.1% had good posture respectively. Similarly, Arfa Khawar in 2022 conducted a study to determine whether prolonged sitting among young individuals was linked to upper cross syndrome or not. According to this study's findings, participants, those who

worked for 6–8 hours in sitting experienced a difficulty level of 15.75%, and participants who worked for 8–10 hours in sitting experienced a difficulty level of 26.66%. The research results demonstrated a strong correlation between extended sitting and upper cross syndrome. Because it found a significant correlation ($p < 0.000$) between upper cross syndrome and extended sitting, this study is related to ours.¹⁰

Alshammari in 2023 performed a survey on the students to determine association of upper cross syndrome and use of smart gadgets. According to the results, student who use internet devices for one hour had an 8.7% chance to develop UCS. The likelihood of getting UCS was 70.4% for the student who spent one to three hours.

The research corroborates the current findings as they shown that those who sit for more than three hours are more likely to acquire upper cross syndrome, and the current study found a substantial correlation($p<0.000$) between upper cross syndrome and longer periods of sitting.¹¹

An investigation into the relationship between excessive internet use and upper cross syndrome in Chinese college students was conducted by Zhang in 2023. He used the REEDCO assessment scale that was similar to our assessment tool. According to this study, college students who used the internet excessively were more likely to develop upper cross syndrome with p value <0.001 . The research corroborates to current findings because they demonstrated that individuals used the net devices for extended time duration are more prone to develop upper cross syndrome, and the current study found that IT workers who spend more time sitting at a computer are more likely to develop upper cross syndrome.¹²

In 2021, cross-sectional research performed by the Manoj Abraham to ascertain the incidence of UCS in software professionals. According to the survey to findings, 55.6% of software professionals had upper crossed syndrome with prolong sitting. This study is similar to the current one as the current study also shows a strong indicated a linear link ($p<0.000$) between upper cross syndrome and prolong sitting.¹³

Adeela Asad in 2021 carried a cross- sectional survey to check the correlation between posture and UCS among general population. Similar to current study, this study also used REEDCO assessment scale. This study showed that 42.06% had poor posture whereas 57.94% had good posture. Hence, 24.1% participants appeared with upper cross syndrome. Study indicated the significant association between poor posture and upper crossed syndrome ($p\leq 0.05$). This study results contrast to our current study because this study determine correlation between upper cross syndrome and posture among general population but the current research check the

correlation between upper cross syndrome and longer duration of sitting among IT workers.¹⁴

Shumayam in 2023 carried out a survey to discover the correlation between upper cross syndrome and neck pain in breastfeeding women. The results showed that pain in neck in breastfeeding woman and UCS had statistical strong correlation ($p< .000$). This study results were contrast to current study because they measured using correlation between pain in neck in breastfeeding women and UCS with the help of neck disability index but the current study measures the correlation between prolong sitting and upper cross syndrome among IT workers using REEDCO assessment scale.¹⁵

Razieh Karimian in 2020 conducted research to determine the connection between UCS and upper limbs musculoskeletal disorders in teacher. The research concluded the prevalence rate of musculoskeletal disorders for neck was 53%, 41% shoulder ,39% back and 43% occurrence rate of upper cross syndrome. The survey results raveled the stronger connection between upper limb musculoskeletal problems and upper cross syndrome. This study results contrast to our current study because this showed the significant relationship between upper limb musculoskeletal disorder and UCS in teacher using Nordic Questionnaire and New York test but current study showed the strong correlation of upper cross syndrome and prolonged siting among IT workers using REEDCO assessment scale.¹⁶

CONCLUSION

This study reveals significant correlation between upper cross syndrome and prolong sitting among IT workers in Lahore. The IT workers who are working in sitting position for more than 8 hours are more prone to develop UCS. It is found that underweight and overweight individuals are more prone to develop upper cross syndrome than the individuals with normal BMI.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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REFERENCES

1. Risalda P, Phansopkar P, Naqvi WM. **Effectiveness of active release technique versus conventional physiotherapy in management of upper cross syndrome.** Indian J Forensic Med Toxicol. 2021; 15(1):246-50.
2. Seidi F, Alizadeh MH, Rajabi R, Letafatkar A, Olyaei G. **Comprehensive corrective exercise program improves alignment, muscle activation, and movement pattern of men with upper crossed syndrome: A randomized controlled trial.** Sci Rep. 2020; 10(1):20688.
3. Chandarana P, Rathod S, Sorani D. **Prevalence of upper crossed syndrome in college-going students–an observational study.** Int J Health Sci Res. 2022; 12(3):179-86.
4. Chang MC, Choo YJ, Hong K, Boudier-Revéret M, Yang S. **Treatment of upper crossed syndrome: a narrative systematic review.** Healthcare. 2023; 11:2328.
5. Sepehri S, Sheikhhoseini R, Piri H, Sayyadi P. **The effect of various therapeutic exercises on forward head posture, rounded shoulder, and hyperkyphosis among people with upper crossed syndrome: A systematic review and meta-analysis.** BMC Musculoskelet Disord. 2024; 25(1):105.
6. Naseer R, Tauqeer S. **Prevalence of upper cross syndrome in different occupations.** Pak J Phys Ther (PJPT). 2021; 3-7.
7. Khosravi Z, Mohammad Ali Nasab Firouzjah E, Firouzjah MH. **Comparison of balance and proprioception of the shoulder joint in girls with and without upper cross syndrome.** BMC Musculoskelet Disord. 2024 Aug 2; 25(1):618. doi: 10.1186/s12891-024-07552-5. PMID: 39095725; PMCID: PMC11295306.
8. Dey N, Musale R. **Prevalence of upper cross syndrome in IT professionals.** Int J Allied Med Sci Clin Res. 2022; 10(2):141-7.
9. Ali Z, Abdullah A, Sohail M, Subhan M, Saeed A, Arslan M, et al. **Prevalence of upper cross syndrome among heavy vehicle drivers (HVD): A cross-sectional study.** J Health Rehabil Res. 2024; 4(3):1-5.
10. Arfa K, Khawar S, Tauqeer S, Amjad F, Rubab HI, Wafa HS. **Association of upper cross syndrome with prolonged sitting among young adults.** Pak Biomed J. 2022; 370-4.
11. Alshammari FS, Alzoghbieh ES. **Handheld smart devices effects on postural muscles related to upper cross syndrome.** Acta Sci Orthop. 2023; 6(2):61-66.
12. Zhang C, Zhang J, Yang G. **Association between internet addiction and the risk of upper cross syndrome in Chinese college students: A cross-sectional study.** Medicine (Baltimore). 2023 Jul 28; 102(30):e34273.
13. Abraham MM, Murali S. **Prevalence of upper crossed syndrome among software professionals.** Int J Med Allied Eng Sci. 2021; 7(3):1061-71.
14. Asad A, Farooq N, Kafeel S, Hassan T, Zubair M. **Association of upper crossed syndrome and posture among general population having neck pain in Islamabad.** J Rehman Med Inst. 2021; 7(2):07-11.
15. Shafeeq S, Noreen A, Nasrullah Z, Masood A, Hassan WU, Ahmad S, et al. **Association of upper crossed syndrome with neck pain in lactating women.** Pak J Med Health Sci. 2023; 17(5):192.
16. Karimian R, Rahnama N, Ghasemi G, Lenjannejadian S. **Association between upper-extremity musculoskeletal disorders and upper cross syndrome among teachers, and the effects of NASM corrective exercises along with ergonomic intervention on their upper-extremity musculoskeletal disorders.** Stud Med Sci. 2021; 31:10.

AUTHORSHIP AND CONTRIBUTION DECLARATION

1	Kainat Liaqat: Data collection, analysis, paper writing.
2	Laraib Basit: Data collection, paper writing.
3	Iqra Ibrar: Discussion writing, review of manuscript.
4	Salman Azhar: Data entry, review of manuscript.
5	Saud Ahmed: Literature review, discussion writing.
6	Junaid: Data analysis, entry.