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ORIGINAL ARTICLE

Incidence of Forward Head Posture in Mobile Gamers: Cross Sectional Study

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ABSTRACT

Forward Head Posture is known as "text neck" or "scholar's neck. FHP is brought about by a number of factors, including prolonged computer and mobile phone usage.

Aim: To find out the prevalence of FHP among mobile gamers.

Study Design: Cross sectional study.

Methodology: Total of 194 participants were considered in this study with age ranging from 18 to30 years. The neck posture was measured using a digital imaging technique. The extent of forward head posture was measured by cervicogenic angle by using landmarks. We drew lines connecting the spinous process of C7 vertebrae to that of the tragus of the ear. Pain was measured by Visual Analog Score while a Goniometer was used to measure ranges of motions of neck.

Statistical analysis: The collected data was analyzed by using SPSS version 26. Shapiro-Wilk was used to test normality.

Results: Female mobile gamers (55.6%) have the largest percentage of forward head posture, according to the descriptive analysis. Almost 74% of these individuals play for more than 3 hours each day. Pearson correlation test showed positive correlation between the number of hours played and forward head posture having p-value < 0.01.

Conclusion: It was concluded that computer players have a higher incidence of forward head posture than other people. Because of anatomical changes, women are more likely to develop FHP.

Keywords: Mobile Gamers, Forward Head Posture and Prevalence.

INTRODUCTION

Musculoskeletal disorders (MSDs) are injuries and diseases of the delicate tissues like muscles, ligaments, tendons, joints and ligament[1].These clinical conditions result in myalgias, lumbar torture and other provincial painful conditions with unknown pathologies. The most common regions of body are waist, neck, shoulders[2].

One study showed that musculoskeletal problems is the second most prominent reason for disability in all districts globally[3,4]. Musculoskeletal disorders are the main cause for poor quality of life and decreased productivity[5].

Forward Head Posture is known as "text neck", "scholar's neck", "forward head posture", "ihunch", "iposture", "computer neck" and "reading neck". FHP is brought about by a number of factors, including prolonged computer usage, prolonged mobile phone usage, sleeping with head elevated high by using a bigger pillow, bad sleeping postures, weak back muscles and lack of calcium[6].

Majority of the population has been victimized by forward head posture that results in severe neck pain. This holds skull anterior to the body's center of gravity thus causes stress on the postural muscles of cervical region.[7] Forward head posture with thoracic kyphosis causes Upper Crossed Syndrome. The craniocervical angle is used to identify forward head posture and this angle is measured by drawing a line from spinous process of C7 cervical spine to the tragus of ear[8]. This health issue affects all age groups which ranges from 22-44 years among males while 23-66 years among females. Literature review revealed that normal cranio-vertebral angle among males is 48.8° while 47.6º among females.[9]

With a rise in popular social media and mobile gaming, more and more time is being spent on screens of mobile phones. This has caused a surge in youngsters to spend upwards of 5 hours using their mobile phones in a head forward and neck down posture while gaming. Previous research has found that children and adolescents who play video games or use computers acquire bad posture thus leading to musculoskeletal pain syndromes.[10]

Injuries are caused by strain.[11,12] Forward head posture is caused by looking at a display that is below eye level and causes the head to lean forward, causing the anterior curve in the lower cervical and posterior curve in the upper thoracic vertebrae to be exaggerated which is true for both laptop screens and mobile screens. Apart from this, many people have a habit of staying up late at night in abnormal lying postures and fall asleep while using their cell phones. Forward head posture is also the result of keeping neck flexed at abnormal angles for an extended period of time. These practices are causing increased incidences of neck pain in these people and we suspect that this comes from them developing forward head posture.

Individuals with FHP are more likely to suffer from headaches, neck and shoulder pain. Thus resulting in limited ROM and muscle strength in the neck and back region, as well as weakness and tenderness of shoulder.[13] Musculoskeletal disorders were prevalent globally but in Pakistan no as such research has done before to know prevalence among mobile users hence current study was planned.

Objectives: To find out the prevalence of Forward Head Posture among mobile users.

METHODOLOGY

A prevalence study was conducted on a target population that included Mobile users residing in Lahore. A sample size of 194 mobile gamers with age ranging from 18 to30 years who have their personal mobiles since 2 years was taken. The neck posture was measured using a digital imaging technique. A camera was mounted on a tripod at a distance of 1.5 meters. Landmarks were put to ensure that all participants were in the same location. The extent of forward head posture was measured by cervicogenic angle by using landmarks. We drew lines connecting the spinous process of C7 vertebrae to that of the tragus of the ear. Pain was measured by Visual Analog Score while a Goniometer was used to measure ranges of motions of neck. Individuals who had musculoskeletal spinal deformities, spinal fractures and congenital defects were excluded from this study.

Figure-1: Measurement of Craniocervical Angle

Statistical Analysis: Data was analyzed by using SPSS v.26. Demographic parameters were presented as frequency. Shapiro-Wilk was used to test normality. The correlation between Cervico-cervical angle (CCA) and associated risk variables was investigated using Pearson's correlation coefficient. A p-value ≤ 0.05 was taken as significant.

RESULTS

Out of 194 participants, table-1 showed that female mobile gamers had the largest percentage of forward head posture, according to the descriptive analysis. Majority of these females were above the ages of 19 years. About 55.6% females showed forward head posture while 44.4% of the male subjects had forward head posture. Almost 74% of these individuals play for more than 3 hours each/day. Pearson correlation test showed positive correlation between the number of hours played and forward head posture having p-value < 0.01.

Table-1: Demographic Parameters among Subjects (n=194)

		Forward Head Posture		Normal Head Posture	
Parameters	Categories	N	%	N	%
Gender	Female	69	55.6	25	35.8
	Male	55	44.4	45	64.2
Age	Below 18	35	28.2	17	24.2
	19 to 28	89	71.7	53	75.7
Smoking	Yes	84	67.7	15	21.4
	No	40	32.2	55	78.6
Playing Posture	Sitting on chair	10	8	8	11.4
	Lying on bed	24	19.4	16	22.9
	Sitting on bed	70	56.6	28	40
	Sitting on sofa	20	16	18	25.7
Breaks During Playing	Yes	54	43.5	45	64.3
	No	70	56.5	25	35.7
Playing Hours	Up to 2	32	25.8	26	37.1
	3 to 5	55	44.4	33	47.1
	5+	37	29.8	11	15.8
Strain on Eyes	Yes	68	54.8	37	52.9
	No	56	45.2	33	47.1
Pain in Head	Yes	65	52.4	32	45.7
	No	59	47.6	38	54.3
Stiffness in Neck	Yes	76	62	30	42.9
	No	48	38	40	57.1
Sleep Hours	Less than 5	74	59.7	25	35.7
	6-8	50	40.3	45	64.3

DISCUSSION

Females accounted for a higher percentage of FHP (55.6%), according to the results of this study. Our findings support those who say that female students have two times the amount of FHP as male students.[14] Females usually get 2 to 3 degrees of neck flexion relative to males in standing cervical posture study, which may explain the higher percentage of FHP in females. Also in adults, major CV-angle variations were discovered, with females having more FHP than males.[15] In contrast to the current findings of a high percentage of FHP in females, one researcher concluded that there was no substantial difference in FHP between genders.[16] In current analysis, the age group below 20 has the lowest percentage of FHP. These results were consistent with previous studies that found a high prevalence of FHP among their participants (12–16-year).[17] In comparison to non-smokers, our findings show that smokers have a higher prevalence rate of FHP. Smoking causes skeletal muscle damage that produces effects like impaired muscle metabolism, increased inflammation with oxidative stress as reported by many studies.[18-20] Aside from that, smokers' neck flexor and extensor endurance capability seem to be significantly reduced.[19] FHP develops as a result of these changes in the skeletal muscle.

Prolonged head flexion results in musculoskeletal problems like 'upper crossed syndrome,' which causes cervical lordosis with kyphosis of upper thoracic vertebrae.[20,21] Different sitting positions effect motor activity.[22] One study reported that greater the gap between the trunk and the computer desk, more is the chance that FHP develops.[21] According to the findings of our research, gamers who use mobiles have a higher risk for FHP development. Similarly, one study documented that prolonged usage of electronic gadgets (laptop or tablet) results in FHP and increased neck muscle activity.[20] Previous research has shown that standing height affects neck flexion when using a monitor or screen.[23] Younger students who develop forward head posture are at risk for cranio-mandibular dysfunction and cervical spine disorders.[24]

The current research illustrated the impact of game length on the risk of developing FHP. Muscle fatigue is demonstrated by an increase in intramuscular pressure after prolonged muscle activity for more than one hour.[25] Increased tissue pressure and electrolyte homeostasis disturbances contribute to low-level contractions in musculoskeletal disorders.[26] When using smartphones, maintaining a fixed posture with neck flexion can cause muscle fatigue more quickly than looking upward.[27] When making seating changes, the degree of angulation of the chair's backrest support is a significant aspect to consider.[23] This research backs up the findings of the current study, which found that those who do not use a proper backrest or ergonomic chairs have a higher percentage of participants with forward head posture (90.7%). If the office backrest chair was set to 1100, adding the lumbar roll had no effect on head and neck posture.

Limitations: It was a single centre study and we did not perform genetic workup among patients in-order to find the genetic cause. There was less follow-up and it was carried out on small sample size.

CONCLUSION

It was concluded that computer players have a higher incidence of forward head posture than other people. Because of anatomical changes, women are more likely to develop FHP. Our findings showed a correlation between FHP and screen time spent. Because of the static posture of cervical spine, people who have screen time more than 3 hours/day have a high chance of developing an FHP. Hence screen time should be minimized for all individuals especially young students.

Author's Contribution:

MA&NA: Conceptualized the study, analyzed the data, and formulated the initial draft.

SK&AZ: Contributed to the proof reading.
MN,AR &WL: Collected data.

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