

ORIGINAL ARTICLE

PREVALENCE OF RISK OF KYPHOTIC POSTURE AMONG LAPTOP USERS ACADEMICIANS USING OCCIPUT WALL DISTANCE TEST

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ABSTRACT

Objective:

The objective of the study was to find the prevalence of risk of kyphotic posture in Laptop user using Academics using the Occiput Wall Distance Test.

Methodology:

An observational study was conducted. The simple random technique was used to select 100 participants. A questionnaire was used to collect demographic information of participants and Occiput Wall Distance was used to evaluate the severity of kyphotic posture. Chi-square test was applied to analyze the association between occiput wall test and age, gender, BMI and hours of laptop use.

Results:

The result showed the presence of kyphosis in academicians. Total laptop users were 100 participants in which 63 % of participants had mild kyphosis, 26 % of participants had moderate kyphosis and 11 % had severe kyphosis. There is no association between academicians' gender and hours of laptop use was found in Occiput Wall Distance test whereas, there is a significant association was found between academicians' age and BMI with occiput wall distance test was observed.

Background:

There is a misconception about Kyphotic posture which concludes that it's probably being a gender biased phenomenon or depending upon the number of hours a person spends on laptop, the greater the time, the more the chances of it. Whereas in actual, it is dependent upon the age and the actual BMI of an individual.

Conclusion:

The greater the age and BMI the greater the chances of Kyphotic posture, however one with growing age can certainly minimize the risk of Kyphotic posture by maintaining their BMI with the growing age as the old saying goes that obesity is the mother of all problems therefore one should definitely keep an eye on their BMI to overcome the risks of all the risks in life.

Keywords: Occiput wall distance, Kyphotic posture, Forward head posture

1. INTRODUCTION

Posture is the position assumed by the body either with support during muscular inactivity or using the coordinated action of many muscles working (i.e. during muscular activity) to maintain stability or to form an essential basis which is being adapted constantly to the movement which is superimposed upon it. In an ideal erect posture, the body segments are aligned so that the torques and stresses are minimized and standing can be made with minimum energy expenditure ^[1]

and therefore the upper thoracic regions, hyperextensions of the upper cervical vertebrae and extension of the occiput on C1. The FHP is considered to co-exist with hyperextension of the upper cervical spine, compressing of lower cervical spine, rounding of upper back, and elevation and protraction of shoulders. FHP may result in craniofacial pain, headache, neck pain and shoulder ache together with decreased range of cervical motion, muscle stiffness and tenderness. ^[1]

Forward head posture (FHP) or stabbing chin involves hyperflexion of the lower cervical vertebrae

The word "kyphosis" defines a type of curve in the spine. It is normally present in the thoracic spine.

A kyphotic curve

looks like the letter "C" with the opening of the C pointing towards the front. Though the thoracic spine is thought to be curved, if the curve in a person's thoracic spine is more than 40 to 45 degrees, it is considered abnormal - or a spinal deformity.^[2]

Hunchback or thoracic hyperkyphosis defines an extreme antero-posterior curvature of thoracic vertebrae greater than 40°. In younger people, the normal kyphosis angle is between 20° and 40° and in older people the normal kyphosis angle is between 48-50° in women and 44° in men.^[3]

Abnormal posturing alludes to rigid body movements and chronic abnormal positions of the body. This position is not the same as showing poor posture or collapsing over. Relatively, it's a tendency to hold a particular body position or to move one or more parts of the body in an abnormal way. Many abnormal posturing behaviours are the result of a serious spinal cord or brain injury.^[4]

When a muscle contracts, the muscles on the further side of the joint normally offer some resistance to the contraction. The muscle groups fail to offer resistance when a muscle contracts in abnormal posturing. This results in atypical movement of the head or back, or stiff or arched feet.^[4]

The normal range of kyphosis is related with both age and gender. The increased kyphotic posture may be developed in advanced ages and it can occur in both male and female gender. Only age and gender are not the risk factors for increased kyphotic posture but there are also some other factors include including neuromusculoskeletal impairments, osteoporosis depression and sensory impairments which may be the reason for hyperkyphosis.^[3]

The normal range of kyphosis is related with both age and gender. Kyphotic posture may be increased with advanced ages but it can occur in both male and female. There are also other risk factors besides age and gender including neuromusculoskeletal impairment, osteoporosis, depression and sensory impairment which may be the reason for hyperkyphosis.^[3]

To evaluate the prevalence of risk of kyphotic posture a variety of tests are used. Cobb's method and flexicurve are used to measure the spinal angles. In Cobb's method an angle measured from T4-T9. In flexicurve method, distance measured from C7 to lumbo-sacral joint space and flexicurve is placed on 10x10 paper and draw a vertical line and then the TW and LW lines you need to measure.^[3] There is another test Occiput Wall Distance Test which is performed by standing the patient lean with wall keeping back and head with wall and heels touching the wall. Measure the distance from occiput to C7 vertebrae. It should be less than 5 cm.^[5]

The purpose of this study is to evaluate the prevalence of risk kyphotic posture in laptop user using academicians using OWD test. As one research is carried out on laptop or computer users. So, it is proposed that similar studies be conducted. This study will provide awareness to academicians about the faulty posture while using laptop or other similar gadgets and risk of poor posture.

2. MATERIALS AND METHODS

2.1 Study design and participants selection:

The initially Initially 120 participants were selected randomly for this study in which 20 academicians were excluded who were not meeting the criteria so finally 100 eligible, both males and females with different degrees of kyphosis, aged between 35 and 45 years were participated in this study.

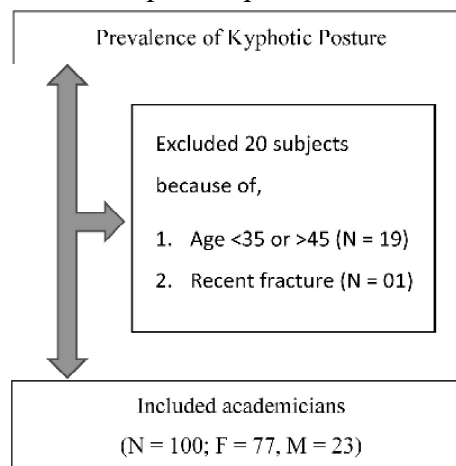


FIGURE 1: INCLUSION EXCLUSION CRITERIA

2.2 Methodology:

Questionnaires were filled by participants which consists of 28 questions before the study and also provided a written informed consent prior to taking part in the study. The OWD test was used to determine the prevalence of increased kyphotic posture. Subjects stood upright as tall as possible with both heels, sacrum, and back against the wall, and with the lower orbital margin and upper margin of the acoustic meatus on the horizontal plane. The perpendicular distance from the bony prominence of C7 to the wall was measured using rulers (FIGURE 2). The researcher classified the participants into 3 groups according to severity of kyphosis upon the basis of OWD test, including mild (lesser or Equal to 5.0 cm), moderate (5.1–8.0 cm), and severe (greater than 8.0 cm).

Chi-square test was used to analyse the association between Occiput Wall Distance and age, gender, BMI and hours of laptop use in academicians.



FIGURE 2: OCCIPUT WALL DISTANCE TEST

3. RESULT

A total 100 respondents were participated in the study from different institutes of Karachi in which 23 were male and 77 were female. The result of Occiput Wall Distance showed that 63 participants had mild kyphosis, 26 participants had moderate kyphosis and 11 had severe kyphosis.

A significant association was found between age and Occiput Wall Distance test ($P=0.012$). Out of 100 participants, 71 participants belong to 35-40 age group, in which 41 participants had mild kyphosis, 21 participants had moderate kyphosis and 09 participants had severe kyphosis, 28 participants belong to 41-45 age group, in which 16 participants had mild kyphosis, 12 participants had moderate kyphosis while no one had severe kyphosis.

No significant association was found between gender and Occiput Wall Distance test ($P=0.841$). Out of 100 participants, 23 participants were male, in which 15 participants had mild kyphosis, 05 participants had moderate kyphosis and 03 participants had severe kyphosis, 77 participants were female, in which 48 participants had mild kyphosis, 21 participants had moderate kyphosis and 08 participants had severe kyphosis.

A significant association was found between BMI and Occiput Wall Distance test ($P= <0.000$). Out of 100 participants, 02 participants were underweight and they both had mild kyphosis, 60 participants were normal, in which 46 participants had mild kyphosis, 14 participants had moderate kyphosis and none had severe kyphosis. 30 participants were overweight, in which 15 had mild kyphosis, 08 had moderate kyphosis and 06 had severe kyphosis and 09 participants were obese, in which none had mild kyphosis, 04 had moderate kyphosis and 05 had severe kyphosis.

No association was found between hours of laptop use and Occiput Wall Distance test ($P= <0.000$). Out of 100 participants, 44 participants use laptop < 2 hours, in which 24 had mild kyphosis, 15 participants had moderate kyphosis and 05 had

severe kyphosis, 25 participants use laptop 2-3 hours, in which 15 had mild kyphosis, 07 participants had moderate kyphosis and 03 had severe kyphosis, 17 participants use laptop 3-4 hours, in which 14 had mild kyphosis, 01 participants had moderate kyphosis

and 02 had severe kyphosis, 14 participants use laptop > 4 hours, in which 10 had mild kyphosis, 03 participants had moderate kyphosis and 01 had severe kyphosis, (TABLE 1)

		Mild (<5 cm)	Moderate (5-8 cm)	Severe (>8 cm)	Total	Chi-square	P-value	Result at P <0.05
Age	35-40 years	47	14	11	71	8.739	0.012	Significant
	41-45 years	16	12	0	28			
	Total	63	26	11	100			
Gender	Male	15	5	3	23	0.3453	0.841	Non-significant
	Female	48	21	8	77			
	Total	63	26	11	100			
BMI	Under Weight	2	0	0	2	35.836	<0.000	Significant
	Normal	46	14	0	60			
	Over Weight	15	8	6	29			
	Obese	0	4	5	9			
	Total	63	26	11	100			
Hours of use	2 hr	24	15	5	44	5.8349	0.441	Non-significant
	2-3hrs	15	7	3	25			
	3-4hrs	14	1	2	17			
	4 hrs	10	3	1	14			
	Total	63	26	11	100			

TABLE 1: RELATIONSHIP BETWEEN OCCIPUT WALL DISTANCE TEST AND OTHER VARIABLES

4. DISCUSSION

The purpose of this study was to investigate the Prevalence of Kyphotic Posture posture in Laptop User using Academicians Using byOcciput Wall Distance Test. 100 Participants were randomly selected for the study. Although only one research is was done on laptop use but there are some other researches related to laptop use like spinal angles, arm pain, neck and leg pain, spinal misalignments, musculoskeletal.

The results of this study were supported by Abdul Rahman, Sheikh Asad, Umer Maqsood, et al (2018) stated that presence of kyphotic posture in 186 (95.38%) respondents and absent in just 9 (4.62%) respondents. Total number of desktop users were 80, in which 5% were normal, 33.75% had mild kyphosis, 48.75% had moderate kyphosis and 12.5% had severe kyphotic posture and in case of laptop

(n=115) users 4.35% were normal, 47.82% had mild kyphosis, 42.61% had moderate kyphosis and 5.22% had severe kyphotic posture. There was statistically no significant association between type of computer and severity of kyphotic posture (P= 0.127).^[6]

A study was conducted in April 2018 by V. Vijaya Lakshmi, J. Deepika & S. Logeswari et al to evaluate thoracic kyphosis and lumbar lordosis in VDT workers stated that the kyphosis and lordosis index when compared among VDT workers and kitchen workers, it was found to be higher in kitchen workers due to their strenuous activities. This followed by teachers with a higher range of kyphosis and lordosis shown their prolonged sitting posture at work being the causative factor.^[7]

Sawitree Wongsal, Pipatana Amatachaya, Jeamjit Saengsuwan et al (2012) stated that the OWD correlated extremely well with the Flexicurve ($r =$

0.902, $p < 0.001$), thereby the data confirmed concurrent validity of the OWD. Although the method did not measure spinal angle, the findings suggested benefit of OWD to quantify and monitor degrees of kyphosis in a large number of populations. ^[8]

The results of this study were supported by Arpassanan Wiyanad, Dr. Thiwabhorn Thaweewannakij, Dr. Pattra Wattanapan et al stated that the OWD greater than 5 cm was more appropriate to screen individuals at a risk of kyphosis (sensitivity 92.31%, specificity 76.47% with the ability to correctly classify up to 83%) than that greater than 0 cm. ^[9]

Hiedar Alyami and Ali M. Albarrati (2016) stated that statistically significant differences for all angles were found when comparing sitting at the desktop computer with sitting at the laptop. Neck angle ($p < .0005$), head tilt ($p < .0005$), and lumbar lordosis ($p = .018$) were significantly higher when using the laptop. The greatest posterior pelvic tilt was associated with the desktop ($p = .018$). ^[10]

Pipatana Amatachaya, Siwitree Wongsu, Thanat Sooknuan et al (2016) stated the excellent reliability among PT, VHV and caregivers ($ICC > 0.90$, $P < 0.001$) and excellent correlation to the data from the flexicurve. Results of assessment were greater than a level of minimal detectable change and could clearly discriminate functional deterioration in participants with different severity of kyphosis ($P < 0.001$). ^[11]

The findings of this study may contribute to existing

body of knowledge as so far only one research was reported in Pakistani context. May be the findings of this study bring awareness among academicians about the consequences of poor body posture on health and how to maintain body posture when they are working on laptop or computer. A limitation is any aspect that hinders a study and its findings. These are the main problems faced by researcher during studies. Short time duration may affect the study, in order to validate the proper findings conclusively the larger duration of study is required. Academician's inco-operation was also faced by the researcher. In addition, data taken from rulers may be have errors if alignment of the rulers used to be no more not longer parallel to the landmark (C7) and perpendicular to the wall. Furthermore, kyphosis measurements the use of OWD require correct palpation skill.

5. CONCLUSION

There is a misconception about Kyphotic posture which concludes that it's probably being a gender biased phenomenon or depending depends upon the number of hours a person spends on laptop, the greater the time, the more the chances of it. Whereas in actual, it is dependent upon the age and the actual BMI of an individual. The greater the age and BMI the greater the chances of Kyphotic posture, however one with growing age can certainly minimize the risk of Kyphotic posture by maintaining their BMI with the growing age as the old saying goes that obesity is the mother of all problems therefore one should definitely keep an eye on their BMI to overcome the risks of all the risks in life.

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