

COMPARING THE THORACIC KYPHOSIS AND POSTURAL STIFFNESS BETWEEN THE HEALTHY OLD FEMALE AND MALES

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INTRODUCTION: the normal curve of thoracic spine is kyphosis and the ability of active rightening of this curve is described as postural stiffness (Hinman2004) [1]. The increase of kyphosis can produce the reduced respiratory capacity(Culhan et al1994)[2], postural disturbance(Schwab et al2006)[3], shortened height(Lundon et al 998)[4] and fall risk(Kado et al2007)[5] and even it was reported that the amount of kyphosis can be a predictor of death in old peoples(Anderson &Cowan1976 and Christensen&Hartvigsen2008)[6,7]. Despite the evidences about the more postural stiffness and kyphosis in old subjects compared with young subjects [1] and despite the known role of sex hormones and menopause in lowering the bone density(Novack2007)[8], there is not any study about the effect of sex on the amount of thoracic kyphosis. The objective of this study is measuring and comparing the amount of thoracic kyphosis and postural stiffness between the old female and males.

METHODS: in this analytical study, 36 healthy old subjects (21 female and 15 male) by the average age of 69.3 ± 4.7 were recruited by simple convenient sampling from a cultural club for old peoples. The amount of kyphosis was measured by flexible ruler mounted between the spinous process T12 and C7 during the stable standing in front of a stabilizer apparatus, both in relaxed and erect postures. The amount of kyphosis

was measured by Θ angle and index of kyphosis. The difference of the kyphosis in relax and erect posture was used as an index of postural stiffness. The data were analyzed by SPSS 16 and we used the t-test for comparing the kyphosis and postural stiffness between the male and females and also Pearson correlation test to study the relation between the variables. **RESULTS AND DISCUSSION:** the average kyphosis in relaxed standing in females was 47.3 ± 14.5 and in males 54.1 ± 10.5 . Despite the more kyphosis in males, there was not any significant difference. The kyphosis in erect standing in females was 41.5 ± 11 and males 46.7 ± 12 and there was not any significant difference between both groups. The subjects in both group could decrease the kyphosis by standing erect by $p=0.0001$, but the amount of this decrease (postural stiffness) was not different between the females and males. The kyphosis in rest had positive correlation with its changes due to rightening of the trunk. There was also correlation between the postural stiffness and BMI of subjects. Based on our data, there is not any difference between the kyphosis of men and women. This finding was opposed to the expectation of the researchers to see the more kyphosis in women because of the changes due to menopause in old women. With respect to this fact that all of the female subjects in this study were menopausal, we expected that the changes in the density of bones due to menopause create more kyphosis in these subjects, but our findings did not confirm this hypothesis. Since the subjects in this study were healthy this finding could be justifiable. The subjects who had more kyphosis were enable to cause more changes in the amount of kyphosis so they had less postural stiffness. This is also rational because our subjects were healthy and more curve permits more correction and movement. In all of the subjects, postural stiffness was increased by increasing the BMI that could suggest the BMI as an efficient factor in reducing the mobility of the spine.

Key words: kyphosis, postural stiffness, old, females and males.