Prevalence lordosis and dorsal kyphosis deformity among girls 23-11 years and its relationship to selected physical factors

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Abstract

Skeletal statuses of the spine form a essential and important part of postures. The aim of this study is investigation of lordosis and kyphosis disorders in three age’s group of female and their relation with some of physical factors. Sample in three age’s group were stage randomly selected (N= 190, age: 11-14, N= 180, age: 15-18, N= 150, age: 19-23). After justifying the subjects, their height, weight, flexibility of muscle of lumbar spine, strength – endurance of muscle of abdomen and deformities (lordosis and kyphosis) measured with measuring tools such as measuring tap, flexible ruler, konometer, etc. The statistics method that used in research include: descriptive method (Frencenci and percent) and for correlation used Pearson’s test (α≤0.05). Data analysis showed that in 1, 2 and 3 groups respectively 36.64, 13.09% and 16% have lordosis deformity and 29.81%, 22.02% and 10% have kyphosis deformity and 6%, 18% and 12% have kypholordosis deformity. There is not significant relation between lordosis and strength – endurance of muscle of abdomen and between lordosis and flexibility of muscle of lumbar spine in all three age’s group of female. There is significant relation between lordosis and kyphosis in female with ages two and tree but this relation is not significant in female with ages one statistically. The results show that girls student in one group rather than upper two groups have upper lordosis and kyphosis and lower kypholordosis. The most important reason for explain this result is that, this subjects are in maturation ages and there is imbalance in their skeletal grow and their strength – endurance of muscles.

Key word: posture deformity, lordosis, kyphosis, flexibility, strength – endurance abdomen

Introduction

One important indicator of national development is health and wellbeing of the population. The future of community-based on mental health and physical dynamics of the youth of the community, so there is a healthy and empowered society that it is greatest national resources of community.

In the car Life today, although industrial and technological progress brought prosperity to many and a source of valuable services to people s, but it also has several side effects. The main complications that can point out replace the car as muscle power that lead to sedentary, non active and obesity. Besides these factors, the wrong patterns of sitting, standing, walking and carrying objects, use of inappropriate clothing, illness, inheritance, employment status, culture and the anthropometric characteristics cause weakness and impaired mental development and to motor deficit. Poor mental development causing motor abnormalities causing and person to losing their optimal body condition, these weaknesses lead to organs weakness of the body such as the circulatory and breathing systems. The quality and how the human body posture is important because it changes resulting from this transformation (Daneshmandi et al., 2004). Corrective exercise as branches of physical education and sport science, applied science in society, especially schools, which includes identifying goals, education, prevention, improving physical abnormalities and movement patterns of individuals. The posture that person give in child or tanager time. Because children of this age are growing epithelial and cartilaginous plates epiphyses their
bones are not yet a state of bone, corrective exercise and sports can reshape deformities in the right direction (Muller and Cantu, 1999).

Several studies conducted in the field of posture and deformity that with different results, but all of them confirm the high prevalence rates of abnormalities in the spine between student (Gharakhanlou, 2006), workers (Habibi, 1991) and national team athletes (Alizadeh, 1990). Based on scientific evidence of common abnormalities among female students are side and lumbar lordosis and kyphosis disorder.

Mousavi Gilani (2001) done a study entitled A Comparison prevalence of vertebral deformities in the male and female students of Zahedan University of Medical Sciences. He observed that 97.77% of boys and 96.48% girls and 97.15% of the overall sample have vertebral deformities. The most common disability prevalence in males over the shoulder is (68.88%) and lumbar lordosis in female condition is (82.35%) (Mousavi Gilani, 2001).

In another study, Karimi (1384) compared the prevalence of musculoskeletal disorders of the upper limb of boys’ senior secondary school students in Gorgan city and Zahedan. The results showed that the total anomaly of Zahedan and Gorgan is 48 and 32 percent and significant difference was observed between lordosis and kyphosis of students of Zahedan and among the students of Gorgan, Gorgan and Zahedan (Karimi, 2005). Meanwhile, Daneshmandi and colleagues (2004) compared Abnormalities of the spine boys and girls, students. They showed that 79.75 per cent of boys and 81.66% of girls and 80.68% of the total study population have spinal postural abnormalities. There was a significant difference (P £ 0.01) in shoulder and kyphosis between the boys and girls in the spinal dorsal view (P £ 0.01) and the prevalence rate of abnormality in girls was more than boys (Daneshmandi et al., 2004).

Arshadi et al (2007) investigated the relationship between the flexibility of the spine kyphosis and lordosis in 100 male students with a mean age41/1 ± 27/23 of Tehran University that they have not symptoms or history of surgery to the spine and muscles in that area. The results showed that there is no significant relation between flexibility of back muscle and kyphosis and flexibility of lumbar muscle and lordosis (Arshadi et al., 2007).

Zahedmnnsh (2008) in his study on high school physical education students reported the lowest prevalence of knee valgus deformity and kyphosis (Zahedmanesh, 1999). Most studies in our country showed that most of people especially students have abnormalities. And investigations and longitudinal studies of most countries lead to silf and sort schools classify students based on evaluation if their physical condition. That the treatment of them was carried out in continue. In our country programs, courses and hours of educational unit was not appropriate with body condition and abnormalities in children and adolescent. And physical activity in schools can not any difference, according to the type and nature of the discipline, students.

The present study attempted to determine the prevalence of these disorders in the region investigation and examine the relationship between spinal flexibility and endurance of the abdominal muscles to determine the skeletal, abnormalities.

Materials and Methods

The research is selected a descriptive - correlation. The population was middle school and high school students and college students of Payam Noor university of Nurabad city that are enrolled in the academic year 91-90. The sample consisted of three group of ages 11-14, 15-18 and 19 -23 years of Nurabad city that studying in schools, high schools and universities (N = 4500). Therefore with phase randomized 520 samples (190 girls with aged 11-14 years, 180 girls 15-18 years, and 150 women 19-23 years) were selected. From high school a middle school is selected 4 centers randomly. Two classes were selected from each center (samples in each class and each school was selected variety). In Payam Noor University with randomized phase was selected 150-student such as samples in the different field of education (Biology, chemistry, literature, etc). The data considered in the study were 161 middle school and 168 high school and 150 college students. After locating the test in any school, the subject to turn into the examination room and underneath the subjects’ were measured height and weight by a researcher and conducted the measurements of kyphosis and lordosis by other researchers. Measurements include:

1 - A written consent form signed by the person examined
2. - Measurement of height samples
3 - Weighing samples
4 - Draw an arc thoracic and lumbar lordosis and kyphosis was measured by flexible ruler for calculating the lordosis and kyphosis angle.
How to calculate the angle of kyphosis and lordosis:

1. At the beginning and the end of the curve connect with ruler and the line is called L, the length of the line can be measured and recorded in mm.
2. Draw a line from the apex of the curve perpendicular to the line L that it is called h. The length of the line measured in meters and millimeters.
3. Angle is calculated by using the following formula:
   \[ \theta = 4 \arctan \frac{2h}{l} \]

For further validation, each measurement was repeated twice and the average angle obtained was considered as arch angle. For angles greater than 40 degrees of dorsal known to be kyphosis abnormalities, and lumbar lordosis angle as much as 30 degrees known to be lordosis abnormality (8).

5. Bent knee sit-ups test: The purpose of this test is to evaluate the strength and endurance of abdominal muscle. In this test, the subjects sleeps on her back with knees bent and doing sit down and lie for a minute. The correct number of sit-ups in a minute is criterion for strength and endurance measure.

6. Right of spinal muscle flexibility test: This test is performed using meter box of flexibility. Each sample sit down with legs stretched out in front of the bench, while bend forward and stretching out his hands with a ruler measuring the flexibility on box.

To describe and determined the relationship between data was used spss 17 software. Pearson's correlation coefficient of agreement is used for scale data and Spearman distance relative is used for scale or ordinal data that are at least one of them, with the 95% confidence level.

Results

Statistical method used to determine the distribution was used of the exam Klmvgrf − Smirnov was shown, normal distribution of data, so the data were analyzed by using parametric test.

<table>
<thead>
<tr>
<th>age</th>
<th>Lordosis (f)</th>
<th>Lordosis %</th>
<th>Kyphosis (f)</th>
<th>Kyphosis %</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-14</td>
<td>59</td>
<td>36.6</td>
<td>59</td>
<td>29.81</td>
</tr>
<tr>
<td>15-18</td>
<td>22</td>
<td>13.09</td>
<td>37</td>
<td>22.2</td>
</tr>
<tr>
<td>19-23</td>
<td>24</td>
<td>16</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

The results showed that 36.64% of people aged 14-11 years and 13.9% of people aged 18-15 years and 16% of people aged 23-19 years have complication of lumbar lordosis. 29.81% of people aged 11-14 years and 22.2% of those aged 15-18 years and 10% of those aged 19-23 years, have symptom kyphosis (Table 1).

Table 2: Pearson’s test results to evaluate the relationship between symptoms of lordosis and abdominal muscle strength and endurance in three age groups

<table>
<thead>
<tr>
<th>age</th>
<th>Correlation coefficient</th>
<th>F</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-14</td>
<td>0.078</td>
<td>161</td>
<td>0.32</td>
</tr>
<tr>
<td>15-18</td>
<td>0.047</td>
<td>168</td>
<td>0.54</td>
</tr>
<tr>
<td>19-23</td>
<td>-0.031</td>
<td>150</td>
<td>0.76</td>
</tr>
</tbody>
</table>

As seen in the table to the lordosis disorder and abdominal muscle strength- endurance is no relationship between the three age groups (Table 2).
Table 3: Pearson’s test results to determine the relationship between the risk of developing complications of lumbar lordosis and kyphosis in three age groups

<table>
<thead>
<tr>
<th>age</th>
<th>Correlation coefficient</th>
<th>F</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-14</td>
<td>0.06</td>
<td>161</td>
<td>0.93</td>
</tr>
<tr>
<td>15-18</td>
<td>0.17</td>
<td>168</td>
<td>0.02</td>
</tr>
<tr>
<td>19-23</td>
<td>0.33</td>
<td>150</td>
<td>0.001</td>
</tr>
</tbody>
</table>

The results showed that there was a statistically significant relation the incidence of complications of lumbar lordosis and thoracic kyphosis in two age groups 18-15 and 23-19 years, but there is not statistically significant correlation between the ages of 14-11 years (Table 3). It was also observed that 6% of those aged 11-14 years and 18% of those aged 15-18 years and 12% of those aged 19-23 years, have kypholordosis symptom. There is no correlation at all three ages group in the flexibility of the pelvic and lumbar lordosis occurrence.

Discussion and Conclusion

Survey results show that a greater percentage of female students aged 11-14 years of age can have lordosis than double its complications. The findings of the research is consistent with Khoshbakhti (1992), Gharaifarliou (1989), Vanzy et al (2007) and Zahedmanesh (1999), who have reported a high percentage of people ages 10-15 years complication of lumbar lordosis. The prevalence of this disorder in girls that can be causes muscle weakness especially abdominal muscles, lack of exercise and exposure to grow and reach maturity. This leads to a mismatch between their skeletal structure and muscle strength and finally lead to increased complications of lumbar lordosis, of them. The results also show that prevalent of kyphosis among girls aged 11-14 years is more than the two group age. This results of researchers such as Eghbally (1982), Kratnvva et al (2007) and Murray et al (1999) are consistent but is not consistent with the research of Zahedmanesh (1999) that in their study on high school physical education students was report the lowest prevalence of knee valgus deformity and kyphosis.

Most common reason of kyphosis can be motion to poor hygiene, poor decisions when sitting, improper use of equipment such as tables and chairs in long time and muscular imbalances. Students at this age are complicated with kyphosis, Due to the symmetry of the growth spur in height and reach a mature stage face to the short -and lower chest muscles flexibility and a result of respiratory muscle weakness. Also, due to the specific cultural issues that the parents of girls would be emphasizes. It can be the reason for the prevalence of this complication at an early age. The findings of the research show that no relationship between symptoms of lumbar lordosis and abdominal muscle strength- endurance in any of the categories - age. The result of the study is inconsistent with resula of Daneshmandi (2003) but is consistent with result of Kohandel (1994) that down on190 people athlete and non-athlete in the city of Karaj, Zakeri (1996) and zahedmanesh (1999). In some subjects, are not consistent structural factors such as skeletal problems and the type of test and measurement instruments of power - strength of the factors that influence the meaning? Muscle weakness can be one of the main factors affecting lordosis, strengthen muscles, with increase flexibility in antigravity muscles (right side of the spine) and hamstring muscles with a proper pattern of behavior can move to resolve this problem effectively. In some subjects, structural is not consistent factors such as skeletal problems and the type of test and measurement instruments of power - abs strength of the factors that influence the meaning. According to the findings of the present investigation aged 11-14 years accounted for the lowest common Kypholordis. Several factors can be effected occurrence Kyfolordis.

Survey results show that there is no correlation between the flexibility of the pelvic girdle and lumbar lordosis occurrence at all three ages. This means that the high flexibility of the pelvic girdle ~ failed to prevent the occurrence of lumbar lordosis. Factors such as reliability of tester flexibility testing type (Maybe this test alone is not determine the amount of flexibility of pelvic girdle and need to perform several different tests at the same time), the
detection of structural or situation lordosis in between subjects, management of the flexibility exercises subjects before taking the exam can be found in the cited scientific justification. These findings are inconsistent with the research results Roshan (1996), Mueller and colleagues (1999) and Harrison (2001) who found a positive relationship between flexibility and lordosis side effects, and are consistent with the results of Akhvtyan (2001) and Rahmani-Nia (2004). The reasons are lack conform can be pointed to various factors, including flexibility tests, the physical fitness level and sex of subject.

Last findings of this study showed that there was a statistically significant relation between the risk of developing complications of lumbar lordosis and thoracic kyphosis in two age groups 15-18 and 19-23 years. These findings is inconsistent with the research results of Roshan (1996) that investigated Torkaman city school boys, and the results of Karimi (2004), Akhvtyan et al (2001) and Zakeri (1996), that all investigated complicated relationship between the risk of lumbar lordosis and kyphosis.

Tus Consistent with previous research and the present study, some assumptions have been some other counter. In investigation of lordosis, researcher believes that in age group (14-11 years) the risk of lordosis is lower than another group. Probably the reason that the claim is justified can be growth spur of high and subsequent imbalance between the growths of skeletal structure and their muscle strength-endurance. About the effect of kyphosis can be pointed, factors such as muscular imbalances, poor flexibility, muscle chest and above is specific cultural issues that parents between the ages of puberty, stressed. Scheuermann kyphosis is the type of kyphosis which is a well known in adolescence that may occur causes more knowledge to young students is a major complication of kyphosis. About of the relationship between lumbar lordosis and abdominal muscle endurance recommend that along with increased abdominal muscle endurance, flexibility of the spine and hamstring muscles of the right will increase. According to this study because each of these factors alone can not prevent the occurrence of lordosis, thus Having a proper movement patterns and standard of the items that can help reduce the incidence of this complication. Pelvic girdle high flexibility of the component that studied in this research. Study findings showed that the flexibility in the pelvic area are good, we were observed lordosis disorder in some subjects. Perhaps the most important factor in this result is obtained that flexibility alone cannot be an important factor in the occurrence of lordosis. Gender of subject, their differences in hip status than men and they also lack the precise control of their fitness level or athletic background is the factors that influence the results.

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References


