CONDITION OF POSTURE, SPINE AND MALOCCLUSION OF 11-12 YEARS SCHOOLCHILDREN

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BACKGROUND

1. The musculoskeletal system is one of the important indicators of students’ health.
2. The posture disorders and spine deformities have the leading rank place in the structure of sickness rate of schoolchildren.
3. The factors of non optimal educational environment have a negative impact on this system and they should be considered in preventive technologies.
4. Medical and social importance of children’s posture disorders, spine deformities and malocclusion requires the creation of preventive program, which should be integrated into educational process.
The aim of the study was to assess the state of posture, spine and occlusion in schoolchildren aged 11-12 to determine the prerequisites for the development of preventive technologies.
STUDY DESIGN

- study of posture and spine using the method of computer-optical topography;
- dental examination;
- functional muscles testing;
- evaluation of the stato-kinetic stability of children with normal occlusion and malocclusion;
- determination of the prerequisites for the development of preventive technologies.
COMPUTER-OPTICAL TOPOGRAPHY
THE POSTURE DISORDERS AND SPINE DEFORMITIES IN SCHOOLCHILDREN AGED 11-12 YEARS

- Normal: 62.4%
- Posture disorders: 11.8%
- Spine deformities: 25.8%
MALOCCLUSION AND DENTAL CARIES IN SCHOOLCHILDREN AGED 11-12 YEARS

Occlusion

- Normal: 47.8%
- Abnormal: 52.2%

Tooth enamel

- Normal: 63.8%
- Abnormal: 36.2%
POSTURE, SPINE AND MALOCCLUSION IN SCHOOLCHILDREN AGED 11-12 YEARS

<table>
<thead>
<tr>
<th>Posture</th>
<th>Normal occlusion</th>
<th>Malocclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posture normal</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Posture disorders</td>
<td>42.3</td>
<td>57.7</td>
</tr>
<tr>
<td>Spine deformities</td>
<td>37.5</td>
<td>62.5 (p&lt;0.05)</td>
</tr>
</tbody>
</table>

%
FUNCTIONAL MUSCLES TESTING

Children performed the test on the grip of the hands behind the back: right hand top, left hand bottom (test one) and vice versa (test two).
THE RESULTS OF FUNCTIONAL MUSCLES TESTING IN CHILDREN WITH NORMAL OCCLUSION AND MALOCCLUSION (TEST 1)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Fully Complied</th>
<th>Partially</th>
<th>Don't Comply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal occlusion</td>
<td>73%</td>
<td>21.6%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Malocclusion</td>
<td>59.2% (p&lt;0.001)</td>
<td>28.6% (p&lt;0.1)</td>
<td>12.2%</td>
</tr>
</tbody>
</table>
THE RESULTS OF FUNCTIONAL MUSCLES TESTING IN CHILDREN WITH NORMAL OCCLUSION AND MALOCCLUSION (TEST 2)

![Bar chart comparing normal occlusion and malocclusion in functional muscles testing. The chart shows the percentage of children fully complying, partially complying, and not complying with the test in both conditions.](chart.png)

- Normal occlusion:
  - Fully complied: 56.8%
  - Partially complied: 27%
  - Don't comply: 16.2%

- Malocclusion:
  - Fully complied: 44.9% (p<0.01)
  - Partially complied: 28.6%
  - Don't comply: 26.5% (p<0.05)
POSTUROGRAPHIC STUDIES USING COMPLEX “STABILAN-01”
THE ELLIPSE SQUARE OF BODY SWAY IN CHILDREN BEFORE AND AFTER STATO-KINETIC LOAD
THE INCREMENT (R) OF ELLIPSE SQUARE OF BODY SWAY UNDER STATOKINETIC LOAD IN CHILDREN OF GROUPS 1 AND 2

\[ R = \frac{SEC2 - SEC1}{SEC1} \times 100\% \]

P<0,05

\[
\begin{array}{c|c|c}
\text{group 1} & \text{group 2} \\
24,8 & 68,1 \\
\end{array}
\]
DISCUSSION

The functional disorders in children with the malocclusion can lead to posture disorders.

The functional posture disorders contribute to the development of dentofacial anomalies.
THE MAIN NEGATIVE BIOMECHANICAL EFFECTS OF THE SITTING POSITION

1. A decrease of the activity of the vestibular system due to fixed head position.
2. Change the physiological curves of the spine (smoothing of the cervical and lumbar lordosis).
3. Increase of the mechanical load on the spine.
4. Shortening of the different muscle groups of the trunk and upper and lower extremities.
5. A weakening of the muscles of the lower extremities due to the reduction of the supporting mechanical load on the feet and joints.
6. A decrease of the bone tissue mineralization due to the hypokinesia and lack of mechanical load on the bone.
THE PREVENTIVE TECHNOLOGIES OF THE POSTURE DISORDERS AT THE LESSON OF PHYSICAL EDUCATION

INFLATABLE TRAMPOLINE IN THE SCHOOL GYM

STRETCHING THE MUSCLES AND SKIPPING AT THE LESSON OF PHYSICAL EDUCATION
THE LESSONS IN THE MODE OF DYNAMIC POSES: SITTING AND STANDING
CONCLUSIONS

1) Posture disorders, spine deformities and malocclusion are frequently identified in children 11-12 years;
2) in children with posture disorders and spine deformities the malocclusion reveals more often than in children with normal posture;
3) children with malocclusion have low values of stato-kinetic stability and muscles condition;
4) school risk factors associated with prolonged sitting, should be considered in the development of preventive technologies.
RESEARCH TEAM

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THANK YOU FOR YOUR ATTENTION!

The Laboratory of the new technologies in hygiene and children’s Health

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