Therapeutic Exercises for Spine Aberrations, According to the Kinematic Analysis, in Improving the Motor Capabilities of Children (6-9 Years)

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Abstract

Physical deviations that are closely related to technological development helped to the emergence of diseases resulting from inactivity and lack of movement, So therapeutic exercise is one of the means to help improve the strength of pupils by using the means of assistance as a means of treating deviations of the spine such as (rubber ropes, medical balls, stick and various sponge pieces). The purpose of therapeutic exercises is to help the child return to activity and life as quickly as possible, reduce pain and increase the flexibility of joints and muscle elasticity. Therefore, the researcher used the one-group experimental curriculum (tribal-after test), and the research community was identified from the 150 students and students of the 2018-2019 school year, and 22 students were identified. Their age of (6-9) years in the deliberate way, as the therapeutic program was implemented which includes therapeutic exercises for (6) weeks by (12) therapeutic units and the time of the therapeutic unit (35) minutes, and concluded the researcher that the therapeutic units followed by the researcher to reduce deviations in the column.

Keyworld: *Biomechanic of sport, Therapeutic exercises, motor capabilities of children.*

Introduction

Good texture sits as the outward appearance through which we define the human pause and the beautiful shape of it. Due to the increased prevalence of physical deviations that may be closely linked to technological development, the emergence of diseases resulting from inactivity and lack of mobility, therapeutic exercise is one of the means to help improve the strength of pupils by using assistance as a means of treating spinal deviations[1]. The purpose of therapeutic exerciseis is to help the child return to activity and life as quickly as possible and reduce pain and increase the flexibility of joints and muscle rubber[2]. The process of describing the movement must be attributed to the axes and imaginary bodies in the human body where the point of prevention these bodies represent the point of the center of the weight of the body and there are three axes and three flats and when the representation of movement is said to be around the axis and this movement is located in the flat and this helps in the mechanical analysis of movement which is one of the method of research in the field of biomechanics which is looking for the effect of internal laws[3]. The human spine is the most complex part of the musculoskeletal system, the basic functions of the spine are to protect the spinal cord, support the head, neck and upper limbs, transfer loads from the head of the trunk to the pelvis and allow various movements. The use of kinmatic analysis[3] and x-ray to identify spinal deviations in pupils and pupils of the sample by comparing it with the correct anatomical position, Hence the importance of research in the use of therapeutic exercises and aids such as (physical ball, rubber ropes, some sponge pieces, wooden stick and other tools) that help in the treatment of spinal deviations in pupils by strengthening tendons and ligaments and increasing the flexibility of joints and muscle rubber where Taking care of strength helps to reduce these deviations, And through the researcher's observation of the problems suffered by schoolchildren from carrying bags more than the required weight or study seats not suitable for the age of the students as well as sitting long imam TV or electronic devices make the child low movement and activity and may be due to

a genetic factor, as well as excess weight these factors lead to real problems suffered by society[4], so the study aimed to prepare therapeutic exercises using the means of assistance, and to identify the effect of therapeutic exercises for some spinal deviations according to analysis Kinematic in improving the motor abilities of children.

Material and Method

The researcher used the one-group experimental curriculum (tribal-after test), the research community was identified from the 150 students and pupils of the Amirat Primary School for Boys/Girls in Najaf The treatment program, which includes (6) weeks of therapeutic exercises with (12) therapeutic units and the time of the treatment unit (35) minutes, was determined by the method of treatment.

Community photography and presentation of video photography to a committee of doctors specializing in orthopedic surgery:

1. Preparing a special form on which the members of the committee indicate cases of deviations of the spine.
2. After that, the sample was determined by those who had deviations in the spine and in the intentional manner and numbered (22) pupils.
3. X-ray image of the spine was taken from the back and from the side to determine the degree of deviations.
4. The degree of deviations was determined by the introduction of the x-ray image in the calculator and within the program of dynamic analysis kinovea 8,26).

Devices used in the search: Digital electronic stopwatch (1/60) of a second to measure time and calculate for tests that need time (German industry) number 1 and hand-made Sony cameras with its cushions quickly (100 images/s) number 2 and rubber ropes number (2) Chinese industry and medical ball number (3) Chinese industry weighing (1kg), (2kg) and stick number (2) and various sponge pieces number (6) and physical balls number (3) weighing (1,5).

After looking at many scientific sources and conducting interviews to determine the most important the motor capabilities of children (6-9 years),namely (agility - flexibility - balance - compatibility).

Kinematic Measurements:

First: Horizontal deviation: a deviation of the axis of the shoulders from the horizontal axis, as this variable is measured from the method of x-ray imaging of the sample, and then the introduction of imaging in the program of kinetic analysis kinovea 8,26) inside the computer to determine the angle of the horizontal axis (the first side) and the second side draws between two points or two fixed on the top of the end of each side of the body so that the point of the intersection of the two rectum represents the top of the rectum represents the axis of the two corners representing the axis of the two sides.

Second: Vertical deviation: which is the deviation of the spine from the vertical axis, where this variable is measured from the method of x ray of the sample, and then the introduction of imaging in the program of kinematic analysis kinovea 8,26) inside the computer to determine the angle of the vertical axis (the first rib) and the second rib straight draws along the longitudinal axis of the spine, and the intersection of the rectum represents the head of the vertical angle.

Third: Gibbosity : How to measure the angle of thoracic Kyphosis: By using the x-ray image of the bones of the spine (dorsal area), then the upper and lower arch is determined as the level at which the vertebrae begin to arch, and the degree of curvature is measured by drawing straight on x-ray rays), the first on the upper limits of the upper vertebrae of the arch, the second straight drawing spout from the lower boundary of the lower vertebrae of the arch, and the angle formed by the point of the intersection of the two rectum represents the angle of the curvature (cup). Through the side view e the use of the horizontal axis that is perpendicular to the arrow level on which the curvature occurs, and the natural degree of curvature from the side up to (40 degrees), and the higher degree of (60) need surgical interference, but the degree of curvature between (41-60) can be treated using physical therapy programs[5], as shown in figure 1.

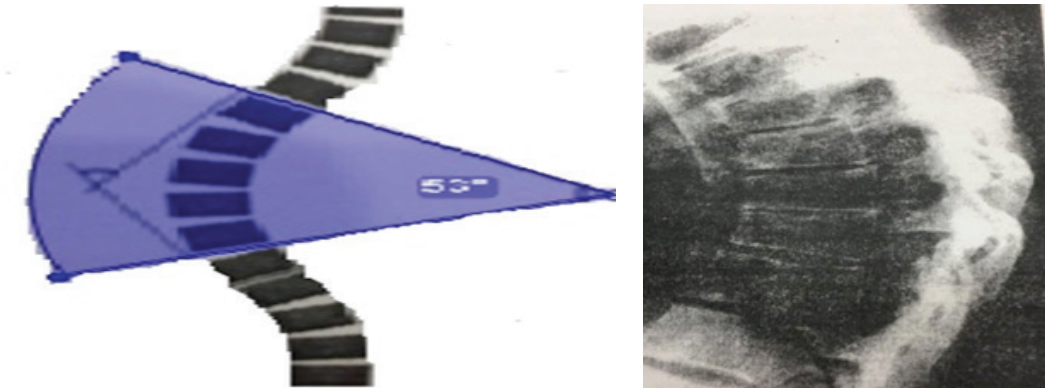

Figure 1. Shows the deviations of the spine and the ways in which it is measured

Results

Presentation and analysis of test results (tribal-dimensional) of the experimental group (pupils).

Table (1): The arithmetic medium, standard deviation, sig value and morality show the differences between tribal and dimensional tests of the student group in the research variables

Variables	Measuring unit	Pre-test		Post-test		Sig	Type Sig
		M	SD	M	SD		
Running as (8)	Sec	23.18	0.84	18.30	1,14	0.000	sig
Bend the trunk forward to stand	cm	1.41	1.13	6.5	1.23	0.004	sig
Stand on the instep	Sec	3.22	0.82	7	0.74	0.000	sig
Barrow for Agility	Sec	30.21	1.93	26	1	0.002	sig
The angle of deviation of the shoulders from the horizontal axis	Deg	13	1.88	4.21	1.65	0.002	sig
The angle of deflection of the spine from the vertical axis	Deg	6.63	1.13	3.5	0.71	0.001	sig
Hunching the dorsal area	Deg	32.40	1.12	27.64	1.92	0.003	sig

The results of the tribal tests after the following tests showed that all the tests conducted on the students have a statistical difference of moral because the moral value is below the level of significance of (0.05).

The statistical results showed a difference between tribal and dimensional tests and in favor of dimensional tests, the researcher attributes the reason for the difference to the applications of the period between the two tests and the various exercises included with the use of several means, and those exercises targeted a large group of skeletal muscles, that the continuous work of the muscles according to the improvement of the topical, some muscles require flexibility i.e. focus on them with exercises flexibility, especially the chest and abdominal muscles to reduce their stiffness and shortness[6], Because the shortness of those muscles works to pull the vertebrae inward, which leads to increased stupor of the dorsal area and this is the result of the continuation of the wrong habits of sitting or standing[7,] or as a result of the lack of movement and activation of those muscles or focus on a muscle group in certain movements such as carrying heavy school bags for long distances, forcing the front muscles of the trunk to contract for a long time in order to generate a tightening force of the spine to the imam, resulting in obtaining vertical weight gain on the center of gravity resulting in the result of the weight of the weight of the weight. The result is bag weight and body weight[8]. The overall improvement in the strength and elasticity of some muscles of the trunk area has helped a lot in reducing deviations of the spine, because deviations greatly affect the compatibility and movement of the pupil with the rapid change of direction during running, and the development of muscle function

and increased capacity while reducing the deviations of the spine helped the sample members achieve a better time when applying the running test in form (8) [9,10], Physical and motor improvement has to do with the physical corrections that give balance in movement and stability. The use of auxiliary means such as rubber ropes, physiological balls, sponge pieces, stick and flexibility exercises that correct the wrong conditions taken by the body in the performance of its work and restore the body to its proper position [11]. Lateral spine flexibility exercises help elongat the short muscles, which reduce the tilt of the torso to its side, either flexible exercises of the back spine help straighten the spine and stretch the short muscles in the pectoral and abdominal area, including the torso on the physical ball, and the braces on the sponge pieces [12]. The continuation of the application of fixed and moving flexibility exercises during the period of therapeutic exercises has a clear effect on reducing deviations of the spine from the horizontal axis and vertical axis and stiffness, because most of these cases are caused by stiffness in more than one muscle due to not being exposed to stretching and elongation as a result of wrong social habits in terms of sitting and standing[13]. The diversification of the physical effort helped in involving the largest number of muscle groups, and as a result the activation of inactive and weak muscles with treatment cases of short muscles on one side of the trunk and weak muscles on the opposite side, and these steps were carried out by involving a group of method such as rubber ropes, and the wooden stick in the twisting and pulling exercises For the side with resistance to rubber cords, with applications of exercises to tighten the abdominal muscles and their flexibility on flat, inclined terraces and arched terraces. All these applications aim to reduce the deviations of the spine resulting from physical and behavioral imbalance, because the presence of these deviations will generate rotational attribution in the parts of the body hindering the constant and motor balance, i.e. the body is tilted to one side, which requires greater effort from the muscles of the opposite side to work to maintain its balance.

Conclusions

The program of therapeutic units followed by the researcher was able to reduce deviations in the spine of the sample, and the use of kinmatic analysis helped the researcher in determining the degrees of deviations of the spine, in addition to the use of auxiliary means with the implementation of therapeutic exercises helped to achieve the goals of those exercises in terms of time and effort and improve the motor abilities of the sample, as working with deviations in the spine early gives better results and delay increases the difficulty of treatment.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the physical education of sport and science and all experiments were carried out in accordance with approved guidelines.

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