

THE EFFECT OF A PERIOD OF MENTAL EXERCISES AND CORRECTIVE ON THE SPINE KYPHOTIC DEAF GIRL

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Abstract. The purpose of this study was to investigate a core stabilization exercise on static and dynamic balance with cerebral palsy spastic diplegia were girls. For this study, 20 volunteers were selected and randomly divided into two experimental and control groups. Protocol core stabilization training for 8 weeks, that was conducted and the control group continued with their normal lives. To test hypotheses and significance level $0.05 > p$ was considered and Spss software version 20 was used for calculations. The results showed that the static balance with eyes open and closed Romberg test, the difference was not significant but no significant difference was seen in dynamic balance with Y- test. It can be concluded that postural control and balance in patients with cerebral palsy spastic diplegia resulting in core stability can be improved.

Keywords: cerebral palsy, spastic diplegia, static balance, dynamic balance, core stability, proprioception sense.

1 Introduction

Human beings are animated by all means and his survival depends on his movement and physical activity. Today, as a result of lack of exercise and physical activity among schoolchildren on the one hand and stressful situations caused great concern and has made life on the other machine many physical and psychological effects, including musculoskeletal pain and discomfort caused by it are quite tangible increase (Izadi, 2007). Although the use of heavy bags, sit behind a desk and non-standard benches and inappropriate, wearing tight shoes, inert, bad move, poor nutrition is the most important reasons in this regard. On this basis, the skeletal spine important part of the person's physical condition. The upper part of the spine is important that in addition to protection and support is one of the most sensitive parts of the body, spinal cord and at the same time the movement is important to maintain the strength of the human body (Alizadeh et al., 2007). Body condition, general health and performance metrics to express the movements and activities. In other words, the foundation of all human movement to the start and end of each move depends on the species status and physical structure. A more appropriate body condition less fatigue and more efficiency. In the meantime, given the very important role of the spinal column to appear. Keep the spine in alignment and placement and attachment to the effective functioning of human muscles and ligaments He added vulnerability. Therefore, any weakness in the muscles holding the spine, will disrupt his stature. The weakness of the muscles of the spine will be adverse effects on the body structure, in the absence of these mechanical failures and unrecoverable come in the form of fixed defects. In view of the side-view backbone structure with arches of cervical, thoracic, lumbar and abroad. The arches are responsible for several tasks, including the ability to increase the strength and diversity and facilitate the movement of the spine. (Gharakhanlou and Alizadeh, 2009). As a result, the importance of postural kyphosis deformity has led to this complication is considered by researchers. Abnormalities in terms of treatment and no right to be different ways in which the use of corrective exercises, postural Kyphosis deformity and reform of the common methods and researchers typically for

topical administration of these exercises, the anomalies in the management of patients (Qadiri, 2013). In Iran, research in this area in recent years has gained a special place, Because officials and community leaders, one after physical education and sports as a means to prevent and treat a variety of physical deformities and mental disorders are community and a large part of the slogan <what is now treated, is yesterday prevention has> been put in charge of physical education and sport. For this reason, Physical Education and Sports as new knowledge with other sciences, has a special place and utilizes the findings of the humanities, and sciences, biology, an important role in health, prevention and treatment of many diseases has taken. Now more than ever, it's important to have medical knowledge that As much as possible rather than prescribe a variety of drugs in the body is associated with many side effects the types of corrective exercise and sports as varied for the treatment and prevention of many diseases prescribed (Daneshmandi, et al., 2009). Statistics regarding the various causes of deafness and are not available in our country, some studies 4.13% of the subjects were suffering from hearing loss (Izadi, et al., 2012). Meanwhile, mental imagery is very useful in rehabilitation, mental exercise is also beneficial for the acquisition of a new skill may improve performance skills in rehabilitation to relearn a skill as well as traffic police officers are also useful due to the effect of a period determined mental exercises and corrective spine status is considered deaf girl kyphotic.

2 Problem statement

The human body is composed of multiple components. These components are located next to each other in a certain way to communicate with each other and form a single structure. Several factors in integrating the collection of structural units work together. Exposure to various body parts over each other like blocks that are positioned relative to each other have to interact, and must be in balance to form a whole. Head, trunk and extremities are the main components of anatomy, as well as reciprocal performance, fit with each other structure and status of the relationship of these sections together physical condition is known. Given the likely impact of different factors on human physical condition throughout life, it is stated that the acquisition of ideal body condition is very difficult and less can be found people who have the ideal body (Alizadeh et al., 2013). Spine basis for the head, shielding the internal organs, ligaments and muscles to connect stable basis, chest and pelvis, and the connection between the upper and lower limbs and trunk mobility provides (Sokhango Akbari and Najafi, 2006). Depending on how the pieces fit onto each other need to be backed up through the muscles of the spine are not distorted. But to count when the muscles holding the balance of power and stature in the spine may not be over, So that groups tend to atrophy, weakness and shortness of another group, the spine curves disrupt his balance and causes the abnormal curvature of the spine occur (Ilkhanlar and Balochi, 2010). Kyphosis of abnormalities that started from a very low level and gradually progresses to the point that structural problems such as wedge-shaped (Wedging) osteoporotic vertebral fractures, which can be a prelude to or neurological disorders later in life, especially in women is. (Hijazi, 2007). The event will be rounded upper back, sternum goes down and comes down chest the small chest cavity is thus very sensitive and possibly internal organs from their original position to move around. The normal kyphosis 20-40 degrees. If the angle of 40 degrees is known as malocclusion. Following the false patterns in the manner of maintenance of the body, such as excessive working hands in front of the body to strengthen the muscles of the opposite, kyphosis is a primary cause of the anomaly. Despite the complications it causes in the body over, hands forward and back feel will have an abnormal curvature of the state, due to falling shoulders forward and back muscles stretch the muscles of the chest area is short, and if this anomaly timely detection and prevention will be irremediable effects (Daneshmandi, 2015). In developed countries through

various tests from the early days, different people in different age groups to evaluate and test the anomalies in the body and preventing the initiation abnormalities such as kyphosis from the early beginning of their life. So it seems that such tests are necessary at all levels of education including primary, secondary, high school and university so that to prevent such anomalies and their treatment action is necessary. (Arian et al., 2010). The disability to a set of physical, mental or psychological refers to a person of ordinary life and their own personal or community opens. Disabilities with limitations and disabilities experienced person as a result of disorders associated. In other words, disability is a function of the relationship between persons with disabilities and their environment and when that happen the people to the cultural, physical or social encountered and probably unable to various systems of society that is accessible to other people, use (Asmirnova, 2003). A hearing impairment usually diagnosed during early life. The growth of abnormal posture with delays physical disabilities are common among deaf children And is often related with atrial malfunctions. (Ryan, et al., 2000). Hearing disability problems often only considered the aspect of communication. However, communication problems, the main defect is caused by hearing loss, hearing bow is also likely to have other health issues (Behrman, 2004). Deafness is a sensory disorder nervous that more than 120 million people worldwide suffer from it, this impairment annually about 150 million dollars to bring that one of the goals of the World Health Organization encourage countries to prevent deafness in international projects such as reducing the age at diagnosis and it is done at birth. Ten percent of the country's disabled population 2.16%, ie 470 thousand people, hearing impaired and speech disabled population and from each thousand children born in the form of Iran, between five and six children with hearing impairment is dumped (Behrman, et al., 2003). Children with sensory disabilities due to adopt a sedentary life-coincides generally suffer from poor physical fitness more important reflected the sensory systems. The human sensory systems play a major role in motor control systems that include proprioceptive sensory, vestibular and visual. Any failure of this system leads to problems with balance posture and coordination are (Kuban, 1990). Research on postural stability in patients with impaired vestibular apparatus indicates that, in the absence of both visual and somatosensory data to be transmitted without difficulty, postural deviation natural state will stand. In contrast, when the data were insufficient visual and somatosensory, had difficulty in maintenance of your posture (Rine, 2013). It seems that children with disabilities to achieve health goals, not enough activities (Liao, 2007). So there is a disability would limit the involvement of children in normal activity (Sadeghi, 2008).

Thus, according to the study sought to answer the question whether the period of mental exercises and corrective spinal condition affects deaf girl?

3 Research purposes

3.1 The overall goal

The effect of a period of mental exercises and corrections the status of kyphotic spine deaf girl.

3.2 Specific objectives

1. The effect of a mental exercise period extension and repair of the spinal kyphotic deaf girl.
2. The effect of mental practice and correction of lateral flexion of the spine kyphotic deaf girl.

3.3 Hypothesis of research

3.3.1 The general assumption

A mental exercises and corrective effect on the spine is kyphotic deaf girl.

3.3.2 Specific assumptions

1. A period of mental exercises and corrective to the extension affects the spine kyphotic deaf girl.
2. A period of mental exercises and corrective lateral spinal flexion deaf girl kyphotic impact.

3.4 Default Research

1. The validity and reliability of measuring devices is acceptable.
2. The subjects in this study have contributed to the good.
3. The experimental group did the exercises correctly and under the supervision of a researcher.
4. Subjects have sufficient incentive to participate in the study.
5. Participants do not have the mental and emotional problems.

3.5 Conceptual and operational definitions research words:

3.5.1 Conceptual definitions:

1. The mental exercise: simply a symbolic exercise, including frequent mental imagery visible muscle in the absence of any major moves aimed at improving the performance.
2. Practice Reform: A subset of movement-therapy is used to change various body shapes.
3. Deaf person who prevented him from understanding what others hear the way the ear is even with the use of hearing aids.
4. Status of the spine: spine, the core of the human body in the form of S drawn, and four (arc) is formed, three play an important role: protecting the central nervous system, the weight of the body and the movement and participate in the various movements of the trunk and the supporting role of breast shelves.
5. kyphotic: increase excessive curvature of the spine and posterior sagittal plane thoracic kyphosis to say. This anomaly with increased curvature of the chest, shoulder and round shoulders clear away the situation. In this disorder usually has a curvature of the spine, severe posterior longitudinal.

3.5.2 Operational definitions

1. The mental exercise: In this study, corrective exercises embodiment of the method is a mental workout by deaf girl has kyphosis.
2. Corrective exercises: In this study, carried out corrective exercises selected by the deaf girl with kyphosis, which include power movements, stretching and mobility sector.
3. Deaf: In this study, mean girls kyphosis that the hearing and the ability to hear surrounding sounds and conversations Ha61-80Dsy but not, in fact, people who are deaf and absolute extreme.
4. Status of the spine: In this study, measuring the lateral spinal flexion-extension of the spine and deaf girl with kyphosis by goniometer before and after exercise (mental corrected) is.
5. Kyphotic: In this research kyphosis angle greater than 40 degrees is equal curved deaf girl.

4 Methods and Outline of Research

Sample and sampling, sample 30 deaf girl kyphotic are the inclusion criteria of the study and purposefully into three groups

of 10 patients tested (a group of 10 patients corrective exercises and a group of 10 people mental exercises) the control group were homogenous groups.

Inclusion criteria for research are: 1. All participants are deaf, 2-athletes are, 3. savvy enough to understand simple verbal requests and instructions over the measure have and doing exercise, 4. Ability to have mental imagery, 5-individuals with no symptoms of other diseases, respiratory tract diseases is not, 6. The participants not taking any medication soothing.

Independent variables: 1. Mental exercises, 2. Corrective exercises. Dependent variable: 1. the extension of the spine, 2. Side flexion of the spine, 3. Abduction shoulder, 4. Chest expansion

4.1 Collection tool of data

1. Personal Information Form (age-weight-height - medical history, damage) 2. Consent (to attend the training program) 3.Revised scale visualization capabilities MIQ-R (to assess the ability to visualize the subjects on deaf girl) 4.Flexible ruler (measure-extension of the spine) 5.Goniometer (measuring range of motion in abduction of the shoulder and flexion lateral spinal) 6. Tape measure (to measure the expansion of the chest-height) 7.Protocol 6-week corrective exercises kyphosis 8.Protocol 6 weeks e-mental exercises 9.Mats (for running exercises as well as run quizzes) 10.Foam (for running) 11.Ball (for running) 12.Digital scale beurer Germany (for weighing)

4.2 Procedure

First complete explanation of the process is presented by researchers, students and their parents (group corrective exercises and mental workout as well as the control group), then to express their consent to participate in research 6 week by the participants or their parents completed and more personal information form to be completed by them .Having abnormal postural kyphosis greater than 40 degrees inclusion criteria for this study. After this phase (of three): Measurement of the expansion of the chest, shoulder abduction, extension, lateral flexion of the spine and the spine takes place. Measuring abduction: This measure individually with a goniometer with the goniometer axis in the posterior appendage of the acromion and the shoulder abduction for active and moving animated arm goniometer hand movement takes place at the same time. Extension of the spine, spinal papillae T12, C7 is detected and the normal mode and stand with flexible ruler to measure the distance. Then the person asked to do the maximum extension in the spinal dorsal. And again the distance is measured. Lateral spinal flexion measurements measured with lateral spinal flexion side of the little finger goniometer-measured distance to the ground. Upon completion of the tests (extension of the spine, lateral spinal flexion, the abduction of spine and chest expansion) scores are recorded. Next, the subjects were randomly assigned to three groups and targeted (mental-correction-control) are divided. Each number is 10, after dividing groups, mental practice group questionnaire imagery ability MIQ-R ((The purpose of this questionnaire is to evaluate the ability to see (visual imagery) and feeling (Kinetic Imaging)) to complement and, if necessary rating businesses fail of the band are removed. then participants in their groups fall and training groups provided to them to be. protocols rehearsals correction: this exercise protocol for 6 weeks, 3 times a week and every

other day the girls deaf has kyphosis carried out. duration of the exercise in each session 60 minutes (10 minute warm-up with the use of walking and exercise stretching, 1 minute workout harness, 12: 30 minutes of stretching exercises 31 to 30 minutes of strength training and cohesion, resting between exercises inhibitory elasticity and strength 4 minutes) runs. during training, all exercises under the supervision of researchers carried out and supervising the participants there. after the completion of the 6 week period re-test on them is done to determine the difference between pre-test and post-test that this training has taken place. Weekly protocol is repeated 6-week corrective exercises that time.

Mental exercise training program based model is Zhang Lei. This training lasts a few sessions. (Willson, 2007) of the video (to show the exercises) as well as the teacher of a deaf who are fluent in sign language can be used for this purpose.

The exercise protocol for 6 weeks, 3 times a week for a day among on the deaf girl has done kyphosis. The training for 45 to 50 minutes (definitions of mental exercise - relaxation - learn how mental exercise - training exercises related to the presence of kyphosis in mind) runs. During training, all exercises are carried out under the supervision of the investigator and supervising the participants. After completing the 6 week period on their re-test is done to determine the difference between pre-test and post-test exercise was conducted during this period. Finally, the tests will be taken away from them again. The control group did not do any exercise at this time.

4.3 Statistical methods

Results with an average \pm standard deviation and percent changes are reported. Kolmogorov-Smirnov test to verify the normal distribution of data is done in the case of normal parametric tests will be used. The difference between the mean and the variance homogeneity, adopted by analysis of variance test and Levin were checked. To investigate the effect of corrective exercises and mental workout program on the dependent variables of t-test and for comparison group mean from ANOVA with post-test post hoc test and if non-homogeneity of variance post hoc Dunnett T-3 will be used. An alpha level of 0.05 is considered to be meaningful. Spss software version 20 will be used for calculations.

4.4 The test of hypotheses

In this section to test the hypothesis will be discussed.

H0: A period of corrective exercises on deaf girl kyphotic spine extension has no effect.

H1: A period of corrective exercises on deaf girl kyphotic spine extension has effect.

H0: a period of mental practice on deaf girl kyphotic spine extension has no effect.

H1: A period of mental practice on deaf girl kyphotic spine extension has effect.

Initially, before the hypotheses to be addressed, should ensure the normal or non-normal data. The results presented in Table 1.

Table 1 Kolmogorov-Smirnov test

significant number	Statistics	Standard deviation	Average	Number	Level	group
0.992	0.432	1.312	18.269	10	Pre-test	Test (corrective exercises)
0.391	0.901	1.440	20.606	10	Post-test	
0.982	0.452	1.210	18.229	10	Pre-test	Test (mental exercise)
0.514	0.810	1.323	20.006	10	Post-test	
0.704	0.705	0.563	19.389	10	Pre-test	Control
0.926	0.547	0.626	20.169	10	Post-test	

According to Table 1 As a significant amount of surface area larger than the amount of errors ($05/0 = \alpha$). So the assumption is not rejected and it is concluded that the distribution of the data follow a normal distribution and the default is observing the

normality of the data for analysis of covariance. After the distribution of data was normal, Levene test for homogeneity of variances in the samples examined. Results are shown in Table 2.

Table 2 homogeneity of variances test

A significant number	DOF 2	DOF 1	Levene's test	Level
0.567	18	1	0.340	Test (corrective exercises)
0.238	18	1	1.492	Test (mental exercise)

In Table 2 Equity sample variance is related to the amount obtained significant level (sig) in the (group corrective exercises) equal to 0.567 in (mental practice group) is equal to 0.238 greater than 0.05. Therefore it can be concluded that the sample variance, is homogeneous and the assumption of homogeneity of

variance and covariance analysis were not met. After the homogeneity of variances was evaluated, The analysis of covariance on two experimental and control groups and in both pre-test and post-test described above. Results are shown in Table 3.

Table 3 Covariance analysis

statistical power	The effects	Significant	F	Mean Square	DOF	Sum of squares	Source changes
1.000	0.671	0.000	34.727	14.915	1	14.915	Group (corrective exercises)
							Pre-test
0.980	0.615	0.001	18.157	7.798	1	7.798	Post-test
				0.429	17	7.301	Error
0.970	0.495	0.001	16.693	9.323	1	9.328	Group (mental exercise)
							Pre-test
0.341	0.119	0.119	2.693	1.505	1	1.505	Post-test
				0.559	17	0.559	Error

According to the data of Table 3 Analysis of variance (group corrective exercises) show between mean measurements for corrective exercise and control groups in post-test is significant difference ($P < 0/05$). The hypothesis (H1) that corrective exercise training, on the deaf girl kyphotic spine extension is effective in the experimental group confirmed. Also according to Table 4.5 the effect of (eta squared), which is equivalent to 0.615 per cent is acceptable. The corrective exercises have about 61 percent in the spine extension deaf girl kyphotic make a difference. And also considering the data in Table 4-5 Covariance analysis (mental practice group) show that the average measurements (mental practice group) and control is not at post-test showed significant differences ($P > 0.05$). The hypothesis (H0) that mental exercise training, on the extension of the spine kyphotic deaf girl groups not effective is confirmed.

The second hypothesis test is as follows:

H0: a period of corrective exercises on lateral spinal flexion not affect deaf girl kyphotic.

H1: a period of corrective exercises on lateral spinal flexion deaf girl kyphotic affected.

H0: a period of mental practice on lateral spinal flexion not affect deaf girl kyphotic.

H1: a period of mental practice on lateral spinal flexion deaf girl kyphotic affected (table 4).

Table 4. test hypothesis, normal or abnormal data

significant number	Statistics	Standard deviation	Average	Number	level	group
0.793	0.650	1.411	22.399	10	Pre-test	Test (corrective exercises)
0.523	0.813	1.048	24.394	10	Post-test	
0.902	0.570	1.187	22.199	10	Pre-test	Test (mental exercise)
0.827	0.627	1.435	23.051	10	Post-test	
0.983	0.464	2.038	22.419	10	Pre-test	Control
0.914	0.559	1.781	22.764	10	Post-test	

According to the results presented in Table 4 for this reason the significant amount larger than the amount of errors ($\alpha = 0.05$). So the assumption is not rejected and it is concluded that the distribution of the data follow normal distribution and default

data normality for the analysis of covariance is met. After the data distribution was normal, Levene test for homogeneity of variances in the samples examined. See the results in Table 5.

Table 5 homogeneity of variances test

A significant number	DOF 2	DOF 1	Levene's test	Level
0.777	18	1	0.083	Test (corrective exercises)
0.075	18	1	3.570	Test (mental exercise)

Table 5 concerning the equality sample variance is due to the significance level obtained (sig) in the (group corrective exercises) equal to 0.777 in (mental practice group) equal to 0.075, which is larger of 0.05. Therefore it can be concluded that the samples variance is homogeneous and the assumption of

homogeneity of variance and covariance analysis were not met. After the homogeneity of variances was evaluated, the analysis of covariance of two experimental and control groups in both pre-test and post-test described above. See the results in Table 6.

Table 6 Covariance analysis

statistical power	The effects	Significant	F	Mean Square	DOF	Sum of squares	Source changes
1.000	0.880	0.000	125.156	33.866	1	33.866	Group (corrective exercises)
							Pre-test
1.000	0.746	0.000	50.031	13.538	1	13.538	Post-test
				0.271	17	4.600	Error
1.000	0.838	0.000	87.985	39.501	1	39.501	Group (mental exercise)
							Pre-test
0.328	0.132	0.127	2.577	1.157	1	1.157	Post-test
				0.499	17	7.632	Error

According to the data in Table 6 Covariance analysis (group corrective exercises) show that the mean of measurements in the experimental and control groups in post-test is significant difference ($P < 0.05$). The hypothesis (H1) that corrective exercise training, the deaf girl kyphotic side flexion test group is effective is confirmed. Also according to the table (4-8) the impact (eta squared), which is equivalent to 0.746 per cent is acceptable. The corrective exercises have about 75 percent in the lateral flexion deaf girl kyphotic make a difference. As well as the table (4-8) analysis of covariance (mental practice group) shows that the mean of measurements in the experimental and control groups in post-test will be significant differences ($P > 0.05$). The hypothesis (H0) that mental exercises on lateral flexion deaf girl kyphotic group test is successful, is confirmed.

5 Conclusion

5.1 The first hypothesis

A mental exercises and corrective to the extension affects the spine kyphotic deaf girl. The results showed a course of corrective exercises on the extension of the spine kyphotic deaf girl had an impact. After stretching the anterior trunk, the act of opening the dorsal spine and posterior trunk strengthening exercises are carried out, The mechanism of this effect is that stretching exercises to improve flexibility Kyphosis through the creation of a favorable stretch in the muscles and ligaments, the anterior segment such as small and large pectoral muscles, intercostal muscles, latissimus dorsi muscle and muscle anterior and posterior trunk muscles become weak as spine muscles, large rear, trapezoidal and-a parallelogram, thereby increasing the flexibility of the spine extension, improve range of motion and improve performance, increase mobility and reduce the risk of injury, increase muscle strength girls kyphotic act deaf.

5.2 The second hypothesis

A mental workout and repair of the lateral spinal flexion deaf girl kyphotic impact. The results revealed that a period of corrective exercises on lateral flexion of the spine kyphotic deaf girl had an impact. After stretching in the anterior and posterior trunk strengthening movements, the mechanism of this effect is that stretching exercises to improve flexibility Kyphosis through the creation of a favorable stretch in the muscles and ligaments in the anterior region, such as small and large pectoral muscles, Intercostal muscle, latissimus dorsi muscle and muscle anterior and posterior trunk muscles become weak as spine muscles, large rear, trapezoidal, parallelogram, increase lateral flexion of the spine, improve performance and improve range of motion and increased mobilization column lateral spine acts.

In general, the results of this study indicated that corrective exercises on the spine extension· lateral spinal flexion·abduction and chest expansion is an impact but merely mental exercises on chest expansion and abduction deaf girl kyphotic influence. As a result of the impact mental exercises and corrections on the spine kyphotic there is a deaf girl.

5.3 Suggestions

1. According to the results suggest the corrective exercise program as a complementary approach should be used to reduce the kyphotic deaf girl.
2. Also due to the positive effect on the mental training reduced chest expansion deaf girl abduction and mental exercises to reduce the kyphotic kyphotic recommended that these samples are considered therapists.
3. It is suggested that similar research study on girls and boys with hearing loss has done kyphosis.
4. It is recommended to reduce other forms of hard of hearing and deaf girls and boys over the kyphosis and the results of the present study done compare the products.
5. It is suggested that the impact of the reform program and on other mental disorders are examined.

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