

THE EFFECT OF MUSCULAR BALANCE PROGRAM ON IMPROVING FALL OF THE HEAD FORWARD FOR BLIND DISABLED

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Abstract

Research objective: Identify the impact of a physical training program to improving muscular balance of the major cervical region muscular groups on the deviation of fall of the head forward for Blind disabled in Sultanate of Oman.

Methods: Twenty blind students suffering from the frontal fall of head, were selected purposively, experimental method by one group design with pre- and post-measurement included measuring the length and weight of the body, to measure the degree of pain, measuring muscle strength of the neck, measuring the range of motion, measuring the increase lordosis cervical, (8) weeks training program, three times per week, 60 minutes per session. it has been using a variety of exercises for muscle strength and Stretching of the neck muscles.

Results: There were statistically significant differences between the averages and increase the percentage of improvement in the equations change measurements posteriori pre measurements, and the results indicated that there are significant differences, and increase the percentage of improvement in muscle strength variables, the range of motion and the degree of pain, deformation of the head between the two measurements pre and post in favor of post measurement, has been reached that the proposed program has a positive effect in improving muscular balance, the range of motion, muscle strength and reduce the severity of the pain, leading to improved deviation of head's frontal fall in the research sample.

Keywords: muscular balance, disabled, blind, fall of the head forward, lordosis cervical, muscle strength and stretching.

1. INTRODUCTION

The report issued by the World Health Organization and the International Monetary Fund – Indicates which was released in 2014 that the number of disabled an estimated one billion people by up to about 14% to 15% of the world's seven billion human inhabitants (World Health Organization, 2012) Some estimates suggest that the number of disabled people in the Arab world, an estimated 30 million disabled people, of whom about 7 million in the Gulf countries, and is expected that this number will increase to 50 million disabled people by the end of 2015, as the World Health Organization indicate that nearly km (1000) million someone who has reached the age of three and above are blind, almost (6) of every 1000 children born blind (Abed Rabbo, Magdi Mohammed 2012). Although there are no accurate statistics on the number of blind in different governorates of the Sultanate of Oman but some reports the distribution of schools, branches, students in government schools, Ministry of Education, that apply integrating people with special needs project by sex and maintain in 2013/2014 academic year indicated the presence of what more than 3,000 students from the blind(Al-Shibli, Abdullah Ali 2014). The visually impaired one of various types of disabilities, but most of all, as the worst kind of sensuous loss is the loss of the sense of sight upon which human to know what is going on around him and in the composition of his experiences, and in determining their relations to the environment in which they live, as the blind person live in a world free of the Imagine the sense of the world the image that show tenderness and affection and appreciation and belonging, and all this deepens the blind child's feelings shortfall, so the revitalization of the involvement of the disabled community is essential (Luke, T. 2013).

Christophe, v., Brice, l., Robina, A. (2013) pointed that the presence of deviations for disabled reduces the efficiency of the joints, muscles and the presence of distractions lead to the formation of bone in a new situation matched deviation, a deviation of the fall of the head forward more skeleton distractions that which characterizes the disabled palm of sight, where the blind movement characterized by slow and difficult and inconsistencies kinetic looks for its dependence on the sense of touch when movement or hearing or smell to distinguish sounds and things (Magle, Majed Fayez 2008). neck bearing part of the weight of the ribs and shoulders and arms for contact with the spine, as the blind person has many gestural unconscious movements while sitting, standing and walking, can not be blind to move freely, in control of his body and his poise without worry, he tries to control the head and neck first and then on the back, chest and lower part Finally him on his feet, making it the skeleton with some deviations to avoid this sense of anxiety in motion (Shiro I., Yukiharu H., Yukihiro, M. 2011). The study

underscores (LYLE M., Cynthia S., Michael O., Pierre H. 2014) The most important reasons for the deviation head forward to blind the many gestural movements unconscious while sitting, standing and walking due to its dependence on the sense of touch when movement or hearing or smell to distinguish sounds and objects, which results in postural Deviation, and get used to the muscles on the wrong situation may lead the imbalance between the neck muscles arises frontal fall of the head, and these reasons lead to the palace in front neck muscles, have shown some studies using radiation (x) having great changes and cartilage associated with the deviation, so the deviation may alter various movements and dispersal of power in the side paths that do not serve motor skills and life itself, full healthy body , whether at rest or while on the move is due to the safety of textures, as indicated (Christophe, V., Brice, I., Robin, A. 2013) That the value of the importance of textures is to delay the onset of signs of fatigue of the muscular and nervous and periodic respiratory, as well as keeping the vital organs of the body in the best position to carry out their work, gain good health to do the important organs of the body vital functions smoothly and efficiently, increase self - confidence, acquire good - looking, better performance basic motor skills.

Martin, B., Anett, M. (2015) define muscular balance as that is the strength of one muscle or muscle group and its relationship with the relative muscle or muscle group again, and often expressed muscular balance for the relative strength of the border, and expresses the balance of the relative limits of force in general muscle Agonistic and the corresponding muscles Antagonists Based on the same joint. And lead the nature of the disability to attempt to adapt to the body with a disability and focus on muscle groups required by the nature of the performance of the regular daily movements and thus happens neglect to train muscle groups corresponding and thus spoke increase overall muscle strength without a similar increase in the strength of the muscle groups opposite predisposing to an increased stress and makes them more susceptible to infection As a result of the muscle imbalance between the prime mover muscle and the antagoniste muscle, the researchers have conducted a prospective study Using the survey method on a sample of 10 people with disabilities from the blind to identify skeleton deviations rates among the research community to determine the most common deviations they have, the results indicated that more distractions skeleton was the frontal fall of the head by (45%) of students Omar bin al - Khattab Institute of the blind, and some schools applied for the program of integration, handicapped centers to fulfill for the rehabilitation of disabled children in Muscat during the month of October 2015, and this prompted the researchers to carry out this study to resolve the problem of the phenomenon of deviation fall head for the Blind.

2. OBJECTIVES OF THE STUDY:

The study aims to identify the muscular balance exercise program on improving the deviation of fall of the head forward for Blind disabled in Sultanate of Oman through:

1. Program designing for muscular balance to improve neck muscles balance for blind disabled in Oman.
2. To identify the impact of the program on the degree of deviation of fall of the head forward for Blind disabled of variables (range of motion and muscle strength and the degree of pain and cervical lordosis).

3. HYPOTHESES OF THE STUDY:

There are significant differences between the measurement of pre and post measurement in degree of deviation in The fall of the head forward in the variables (range of motion and muscle strength and the degree of pain and cervical lordosis) in favor of the post measurement.

4. METHODOLOGICAL PROCEDURES OF THE STUDY:

Research Procedures

Research Methodology

The experimental method is used to design the same group with the measure before me and after me measure.

Research population

The research population of the disabled students of the Institute of Omar bin al - Khattab for the blind, and some schools applied for the program of the merger, the status of disabled fulfill consists of rehabilitation of disabled children in Muscat in the Sultanate of Oman's (300) disabled between the ages of 10-14 years old.

The research sample

The research sample (20) handicapped blind Suffering from deviation of head's frontal fall was selected purposively from Institute of Omar bin al - Khattab for blind people aged between 10-14 years.

The researchers finding homogeneity between the research sample in the variables age, height, weight, range of motion, muscle strength, the degree of pain and cervical lordosis.

Table (1) The homogeneity of the sample in the variables age, height weight, range of motion, strength, the degree of pain and cervical lordosis N = 20

Variables	measuring unit	Mean	The standard deviation	skewness
Age	the year	12.95	0.82	0.098
the weight	Kg	37.35	1.63	0.147-
Length	Centimeter	152.4	2.39	0.649-
Range of motion forward	Degree	43.4170	1.70055	1.571
Range of motion Back	Degree	54.6000	1.63830	0.275
Range of motion right	Degree	34.5500	1.53811	0.876-
Range of motion left	Degree	34.7000	1.94936	0.186
Frontal Muscle strength	Kg	3.5800	0.18525	0.614-
Back Muscle strength	Kg	4.4700	0.17502	0.274-
right Muscle strength	Kg	2.3350	0.16631	0.013-
left Muscle strength	Kg	2.3280	0.15251	0.430
The degree of pain	Degree	6.5390	0.32434	0.472-
Cervical lordosis	Degree	152.65	1.268	0.916

Table (1) illustrates that all the torsion coefficients values of the variables under consideration, ranging from (0.876-: 1.571) that is, they are limited between (± 3), which refers to the homogeneity of the research sample in these variables.

Data collection tools:

1. Flexometer device to measure the range of motion and the measured unit (Degree).
2. Tensometer for measuring muscle strength and unit of measure (kg).
3. The degree of pain scale (VAS) To measure the intensity of the pain and the unity of measure (Degree).
4. Stop watch, unit measured (second).
5. Goniometer Device (Gamburtesf) to measure the increase in cervical lordosis, the unit measured (Degree).
6. Rastameter device for measuring the height and the unit of measure (centimeter).
7. Medical standards for measuring the balance of weight and measure unit (kg).
8. Data card for each disabled person to record its own measurements.

Pre-measurements:

It included measurements (measurement of pain degree, measuring muscle strength of the neck, and measuring the range of motion, measure the deviation of the head's frontal fall) as measured by the **degree of pain** (VAS) visual analogous scales it consists (VAS) Of 10 cm horizontal or vertical row and begins a period of pain and other side very severe pain, and requests from the disabled to put a sign on the line (10) cm at any point, which gives (VAS) Index is the severity of the pain or the lack of, and the end of the pain. **Muscle strength of the neck** is measured by setting the person on a chair and tensometer device is fixed on the wall and tied through a belt around the patient's head. Student body back facing the Wall ladder, and then bend the head forward firmly and slowly to measure the strength of the front neck muscles. Student facing the wall ladder, and then bend the head back strongly and slowly to measure the strength of the back muscles of the neck. be the right side of the student facing the wall, and then left bend head firmly and slowly left hand to measure the strength of the side neck muscles, be the left side of the student facing the wall, and then bend the head firmly and slowly hand right to measure the strength of the side muscles of the neck, and the cursor moves the equivalent of the maximum force exerted and consistency at the end of measurement, it is done for a number of three measurements and take the average, must also be careful not to move the trunk during the measurement (Amirhossein, B., Afsaneh, S., 2013) (Lyle M., Cynthia S., Michael O., Pierre H. 2014).

Measuring the range of motion: the student takes to sit down with the stability of the pelvis and shoulders while measuring, Flexometer device is placed on one side of the head, the student begins to bend the neck and steadiness when the maximum period of up to it, the patient bend the neck to succeed and steadiness when the maximum range of up to it, there are three consecutive measurements of the work and take the average readings, were also measured increase Cervical lordosis using goniometer device which consists of a protractor round included a 360 -degree, adorned with vertical Index on the ground and constantly connected to the bar with two indicators , one mobile and one fixed, was determined anatomical points to control the first point, the most prominent spot in the back of the head (para - bearing), and the second point is called fork cervical vertebrae fifth (the deepest point in the cervical cavity), and the third point is called a thorn seventh paragraph (the most prominent cavity points cervical) , it has been protractor device placed along the fixed index (perpendicular to the body) to measure the curvature of the neck angle, and record the reading shown on the device when device status indicators on the initial and second points areas follows:

1. First angle: Put the indicators on the first and second point.
 2. The second angle: development of indicators on the second point and the third.
- The lordosis cervical = 180. (Initial angle + second angle).

And temperatures ranging natural bends to the corners of the neck between (155-159), while the degrees of abnormal bends ranging between (154-153) (Christophe, V., Brice, I., Robin, A. 2013) (Martin, B., Anett, M., 2015).

Post-measurements:

Post-measurement was performed on the sample under the same order as the pre- measurement and under the same conditions.

Muscle Balance Exercises Program:

Muscular balance program Included the exercise of strength and stretching for the prim mover muscles and Compensatory exercises for the antagonistic muscles of neck, Using strength training multiple systems. The program Included strength endurance exercises, and control the body's muscles exercises. Exercises were performed in 3-5sets each of 12-20 repetitions with moderate intensity, Emphasis was placed on the slowly performance of the weights exercises during this period to increase the volume of the participated muscular fibers. Moreover, emphasis was placed on performing during the full extent of motion with momentary lull in the muscles full contraction, with a rest period between 30-60 second. the program period was eight weeks, three times a week, and has reached the number of training (24) sessions . 60 minutes per session. Warming up exercises was 5 minutes, while the time of the strength and stretching exercise was (40) minutes and reached a time period of calm (5) minutes and included a series of relaxation exercises. has been the implementation of the training program after the school day, the researchers use two assistants to implement the program.

Results:

Table (2) The average deviation and the percentage improvement of the sample in the range of motion, muscle strength, degree of pain and cervical lordosis N = 20

Variables	Pre-measurement		Post- measurement		Ratio improvement
	Mean	SD	Mean	SD	
Range of motion forward	43.4170	1.70055	63.3700	1.6 9087	99.5%
Range of motion Back	54.6000	1.69830	65.4250	2.226690	54%
Range of motion right	34.5500	1.53811	53.3000	1.71985	93.5%
Range of motion left	34.7000	1.94936	53.5000	1.46898	94%
Frontal Muscle strength	3.5800	0.18525	5.3600	0.20105	8.5%
Back Muscle strength	3.4700	0.17502	5.3100	0.18035	9%
right Muscle strength	5.3100	0.18035	3.4700	0.35851	5.5%
left Muscle strength	2.3280	0.15251	3.6275	0.15851	6%
The degree of pain	6.5390	0.32434	2.4400	0.14654	20.5%
Cervical lordosis	152.65	1.26	156.60	1.04	2.53%

Table (2) illustrates that the rate of improvement in range of motion ranged from (93.5% and 99.5%) , while ranged in strength between (5.5% and 8.5%) in the degree of pain, and reached 20.5% in the lumbar lordosis .

Table (3) There are significance of differences between the two measurements, the pre and post measurement for sample's in range of motion, muscle strength, the degree of pain and cervical lordosis N = 20

Variables	Differences between the averages	deviation	The value of T.	Significance
Range of forward motion	19.9	2.9	29.8	D.
Range of motion Back	10.8	2.8	17:19	D.
Range of motion right	18.7	2.4	34.57	D.
Range of motion left	18.8	2.3	35.39	D.
Frontal Muscle strength	1.7	0.25	31.26	D.
Back Muscle strength	1.8	0.23	35.03	D.
right Muscle strength	1.1	0.37	13:50	D.
left Muscle strength	1.2	0.22	26.05	D.
The degree of pain	4.09	0.37	49.24	D.
Cervical lordosis	3.95	3.95	10.78	D.

The value of "T" Driven (2.093) at (0.05) level of confidence Table (2) illustrates that the value of (t) calculated ranged from (10.87 and 49.24) , which shows the significance values.

5. DISCUSSION:

table (2.3) showed an increase in the rate of improvement as well as statistically significant differences in research variables between the pre measurement and post in the range of motion, muscle strength, the degree of pain, lordosis cervical and this improvement may be due to the proposed muscle balance program, which included exercises led to improved flexibility in the cervical region, thus increasing the range of motion of the neck, where the percentage of improvement for the extent of forward rang of motion (99.5%), the Back range of motion (54%), turn right (93.5%), left (94%), as evidenced by an increase the percentage improvement in the rates of change of measurements posteriori pre measurements in muscle strength, reaching improvement ratio forward (8.5%), the Back range of motion (9%), turn right (5.5%), left(6%), as well as increase the percentage of improvement in the change of measurements rates posteriori pre measurements in the degree of pain , which amounted to 20.5%, as total improvement rate in the lordosis cervical (2.53%) ones and this the improvement may be due to the exercise of those injured exercises treatment on a regular basis, are embedded in its infancy on the general and comprehensive exercises, as well as exercises (static, free, against resistance) as the exercises muscle strength and flexibility work to increase muscle tone and therefore working on the prevention of recurrence of the injury again due to increased muscle mass of muscle components of the shoulder gerdeal and neck, muscular balance improvement as a result of the student regular practice for the exercises program and lead to increase their mass and strengthen tissues macrophages, and increased blood flow to the muscle, and this leads to increased neck muscle strength, through the use of static exercise in the first phase, as well as Dynamic exercises and resistance exercises until the end of the program (Amirhossein. B., Afsaneh, s. , Azar 2013) And it refers both(David G., Eric J., Jeffrey M. and Patrick M. 2008) That rehabilitative exercises increase joint flexibility and thereby increase the range of motion for him, and increase bone feed are growing properly, and that this exercise works to increase muscle fibers working on the joint, and this is consistent with (Magle. M., 2008) That muscle balance exercise in the form of an integrated program to be treated in an expeditious manner, which shows that the use of dynamic means better and faster than the negative, and then leads to improved muscle working on the neck aware, as indicated (Piet. J. Monique R., Joop D., 2012) That the practice of negative and positive flexibility exercises increase muscles stretching, ligaments, and this feature is lead to increasing in the range of motion for the vertebrae cervical, and increased the ability to pain endure . From the prevuse desiccation, it is clear that the proposed program of muscle balance exercise has a positive effect on improving Blind head frontal fall.

Increasing in the range of motion of the neck joint (Forward, back, right, left) due to the proposed program of exercise treatment, which led to relieve pressure on the ligaments and muscles, thus reducing the pain the cervical vertebral and the return it as close as it was before the injury, This is agree with what indicated by each of (David G.Behm, Eric J.Drinkwater, Jeffrey M. Willardson, and Patrick M.Cowley 2010) and (Shiro Imagama., Zenya., Yukiharu Hasegawa 2013)That muscle balance exercises training program has positive impact on muscles strength, muscles relaxation , stimulate blood circulation , improve muscle tone , reduce pain and improved mental state.

The researchers concluded that diversification within the exercise used different intensity and volume had a significant influence in the development of muscle strength in the training variables varied in volume and intensity helps to further gain strength, and the gradual increase resistance helps to gain muscle strength and growth.

6. CONCLUSIONS:

1. The muscular balance program has a positive effect in improving range of motion and muscle strength and degree of the pain for the Blind disabled people who suffer from the fall of the deviation of the head in front.
2. The muscular balance program has good impact on reducing the deviation of the head's frontal fall.
3. Increasing improvement in the percentages of the rates of change measurements in the pre range of motion and muscle strength and degree of the pain and reduce the deviation of the frontal fall of the head.
4. The muscular balance program has a positive and effective impact on the return of the natural functions of the neck, as a result of easing the pressure on the spinal vertebral.

7. RECOMMENDATIONS:

1. Using the muscular balance program as a guide for rehabilitation for the Blind disabled people who suffer from the fall of the deviation of the head to front.
2. Studying the effect of the muscular balance program on different disabilities and different stages of ages.

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