



A rehabilitation program using formal performance in gymnastics to correct spinal deviations for the injured With upper Cross Syndrome and improve vital capacity

Associate – prof: / Ibrahim Mahmoud Mohamed Deyab

Assistant Professor at department of Exercises and Gymnastics Department, faculty of education sports, Sadat city university

Abstract

Upper stature syndrome is not easy to treat simply by recommending the individual follow healthy habits and exercise, but he must use orthopedic rehabilitation programs for correcting the spine (formal performance exercises for gymnastics). The research aimed to design a program using formal performance exercises in gymnastics for the injured with the upper cross syndrome.

The researcher used the experimental method with the experimental design for one group, using the pre- and post-measurements of it. The research sample was chosen in a deliberate way from students with the spinal syndrome, where the number of the research sample was (14) students with ages ranging from 13 - 15 years old. The researcher used the metal tape device to measure the curvatures of the spine and the Spirometer to measure the vital capacity of the lungs. The results indicated that the formal performance exercise program for gymnastics had a positive effect on improving the body shape and muscular strength of the research sample. In addition to improving the vital capacity. The researcher recommended using the formal performance training program in Gymnastics as a preventive measure in the rehabilitation of patients with upper stature syndrome

Keywords: gymnastics, rehabilitation, Upper stature syndrome, injury

Introduction and Research Problem :

The developed health level of the people is a way to measure the progress and advancement by which nations are measured. A healthy body is a sign of good health. Therefore, it is necessary to preserve the human body of moderate strength by keeping it away from any wrong practices that cause a change in the moderate shape of the body. (1 : 4)

Recent years have witnessed tremendous scientific progress in various aspects of life. That's why modern machines do most of human work which has led to the transformation of strong

muscles into weak muscles. Besides, wrong postures have made children more susceptible to physiological deviations resulting from a lack of physical fitness and as a result of adopting wrong postures for long periods of time while reading, sitting in front of the computer, watching TV, or using mobile phones. (12:99)

The seriousness of postural deviations does not stop at the limits of affecting the deformed part, but rather goes beyond that, as it negatively affects the vital capacity and regularity of breathing. In addition , the appearance of different pains in the lower and upper limbs and their joints. Upper physique syndrome is one of the deformities of body. (112:9)





Bernsten Borenstien (2012) indicates that formal performance exercises in gymnastics are a structural and tight process for the body to modify its movement, improve muscle functions and maintain a good body build, and it also increases muscular strength, flexibility, range of motion and endurance. (6:44)

Upper posture syndrome is a disorder of the muscles located in the neck, shoulder and upper chest areas, and it often occurs with individuals who work in office work for long periods or who sit most hours of the day on computers. Eventually, contraction and shortening of the front muscles of the chest happen. (9: 69)

The scientific explanation for the contraction in the upper part of the trapezius muscle and the levator scapula muscle on the posterior side of the junction with a contraction of the pectoralis major and minor muscle is the weakness of the deep cervical flexors with weakness in the middle parts and inferior trapezius muscle.

Through the researcher teaching ,the curriculum of Posture Education and Gymnastics at the Department of Sports Science and Physical Activity at the University of Hail and field supervision of practical education groups, he noticed the emergence of many postural deviations on students of basic education schools resulting from some wrong posture habits as a result of students sitting for at least eight hours a day during Distance learning and four hours to do school assignments, study, use computers and smart devices in the wrong way .During the period of the Corona virus and what

followed by the transformation of the education system from attendance in schools to a system of distance education from their homes, which was the cause of the emergence of morphological deviations, including upper stature syndrome that leads to distract the working muscles and others to maintain the balance of the body.

Through the researcher's review of other studies and references that dealt with sports injuries in general and deviations in stature in particular, he noticed the scarcity of studies that dealt with formal performance exercises in gymnastics to treat stature deviations, especially upper stature syndrome, which prompted the researcher to design a qualifying training program using formal performance. Gymnastics helps in improving the shape of the body, strengthening the working muscles, improving vital capacity, and returning the cartilage to the closest to the natural state.

Research objective :

The research aims is design a **rehabilitation** program using formal performance in gymnastics to treat spinal deviations, develop the muscular strength of the back and neck, and raise the efficiency of the vital capacity of the lungs for people with upper stature syndrome.

Hypotheses:

1. There are statistically significant differences between (pre-post) measurements for research sample in deviations of the spine and the strength of the back and



neck muscles for people with upper stature syndrome in the sample under investigation for post measurement.

2. There are statistically significant differences between (pre-post) measurements for research sample in vital capacity for post measurement.

Procedures:

First : Research method:

The researcher used the experimental method because of its relevance to the study.

Second : The research sample :

The research sample was chosen by the intentional method from the students of Thabet bin Qais School with spinal syndrome, where the number of the research sample members reached (21) injured students, their ages ranged between 13-15 years, and (4) students

- **The homogeneity of the research sample:**

Table (1)

Homogeneity of the research sample in the basic variables

Variables	unit of measure	mean	deviation	torsion
Length	cm	14.23	.122	2.113
the weight	km	153.80	2.50	.120
Age	year	44.71	1.938	-.195

homogeneity of the research sample in the variables (age, height, weight under study, as the coefficient of torsion ranges between ± 3 which shows homogeneity in the data base.

were excluded to conduct the exploratory study and other (3) students because of their absence from the qualifying program, and thus the number of students in the basic sample becomes (14) students.

- **Sample selection conditions:**

- 1- Applying medical examination and diagnosis to determine the injury by a specialized doctor.
- 2- He must not be subject to any other qualification program.
- 3- That the child has upper body syndrome only.
- 4- Regular attendance in the proposed rehabilitation program throughout the study period.
- 5- Written agreement from the guardian and the child's desire to participate in the proposed rehabilitation program



table(2)

The homogeneity of the research sample in the variables under investigation

N=14

Variables	unit of measure	Mean	deviation	Median	torsion	
spine angles	cervical	degree	151.98	.965	152.00	-2.098
	bra	degree	153.05	.146	153.00	.465
Forward neck muscle strength	KG	4.34	.032	4.335	2.243	
Neck muscle strength posterior	KG	3.03	.016	3.03	-.147	
Back muscle strength	KG	68.14	.020	68.15	.000	
vital capacity	KG	1.73	.017	1.75	-.319	

It is evident from Table (2) that all the standard deviation values are less than the arithmetic averages, and the values of the skewness coefficient ranged between (-2.098: 2.243), which are values limited to (± 3), which indicates the homogeneity of the sample, and indicates a moderate distribution of the sample.

Third : Data collection tools and means :-

The researcher used the following devices and tools to conduct the research measurements, attachment (4) :

-Weigring Machnel - Stadiomate - Spirometer -Tensometer –

Metal Spinal Curvature Tape - Stop Watch

The following forms :

١. Experts in the field of sports, public health, sports injuries, physiotherapy and gymnastics, annex (1).

٢. Experts’ opinion survey form on defining the program as a whole. Attachment(2)

٣. Measurements form for all research measurements for the research sample. Attachment (3)

Forth : Suggested gymnastics formal performance exercises program :

Program objective:

Designing a rehabilitation program using formal performance exercises in gymnastics to treat spinal deviations, develop the muscular strength of the back and neck, and raise the efficiency of the vital capacity of the lungs for people with upper stature syndrome.

organizing the loads with the proposed program : Attachment (4)

The proposed program included (36) training units for a period of (12) weeks



at a rate of 3 times a week. Each unit contains a set of exercises for the formal performance of gymnastics graded in difficulty to develop the physical, kinetic and functional characteristics of the muscle groups and joints in the spine.

That happens through a variety of exercises, and the use of the periodic training method (by repeating a set of exercises with rest periods and depending on the severity of the load) . The program in its final form included three stages .

Table (3)

The main specifications of the stages of the proposed qualification program

Program stages	Number of training units per week	Unit time	Number of training units per week	Number of weeks
First	3	40	3	3
2nd	3	45	4	4
3rd	3	50	5	5

It is evident from Table (3) that all the Program stages its contains Number of training units per week, Unit time, Number of training units per week and Number of weeks.

Selection and training of assistants:

The researcher chose three assistants to help in some research procedures, and to do some administrative work related to data recording. The researcher showed them the objectives of the research , all the information related to tests and measurements, how to conduct them and how to use the devices. Preparing the assistants and understanding the details of the procedures.

The survey study :

The researcher conducted the exploratory study in the time period from 22/1/2021 to 25/1/2021 on the members of the exploratory sample, which

numbered (4) students from the research community and outside the main sample.

The survey aimed to:

- Ensure the validity of the devices and tools used in the measurement.
- Train on how to take measurements.
- Determine the time period to take measurements for each injured person.
- Identify the difficulties that the researcher faces during the experiment and try to overcome them.

Pre measurement

The researcher made the pre measurements for the members of the research sample, related to making measurements and research variables,



during the period from 29/1/2021AD until 1/2/2021AD.

implementation phase

The program of performance exercises in gymnastics for those with upper stature syndrome was applied to the research sample for a period of 12 weeks, three times a week, and it was applied during the period from 2/5/2021 to 26/4/2021.

Post – measurement:

After the end of the twelfth week, the researcher made the post measurements of the members of the research sample, during the period from 30/4/2021AD until 3/5/2021AD, under the same **Table (4)**

conditions that were followed in the pre-measurements.

Statistical treatments:

To achieve the research objectives, the following statistical methods were used:

Arithmetic mean - standard deviation - torsion factor - T-test - correlation coefficient - improvement ratios).

Presentation and discussion of results:

Presentation of the results of the first hypothesis :

The significance of the differences between the averages of the two measurements (pre- and post-test) and the percentage of improvement in Spinal deviations and neck and back muscle strength

Variables	unit of measure	Pre – Measure		Post - Measure		"T" calculated	% improvement	
		Mean	deviation	Mean	Deviation			
spine angles	neck	Degree	151.98	0.965	155.64	0.024	-9.15	%2.35
	bra	Degree	153.05	0.146	156.14	0.020	-12.10	%1.98
neck muscle strength	front	Degree	4.34	.032	6.07	.081	5.17	%28.50
	back	degree	3.03	.016	4.70	.014	4.25	%35.53
Back muscle strength	degree	68.14	.020	74.45	0.02	6.23	%8.48	

* Tabular “T” value at the level (0.05) = 1.761

Table 4 need more explanation





It is evident from Table No. (5) that there are statistically significant differences at the level (0.05) between the mean of the two measurements (pre- and post-test) of the experimental group in the level of the variables under study and in favor of the post-measurement.

Discussing the results of the first hypothesis: -

It is evident from Table No. (4) that there are statistically significant differences at the level (0.05) between the averages of the two measurements (pre- and post-test) for the experimental group in the level of the variables under consideration and in favor of the post-measurement and the increase in the percentages of the rates of change of the post measurements from the pre measurements of the variables of the spinal deviations of the injured Syndrome of upper stature in the research sample.

The researcher attributed this improvement to the regular practice of the formal performance exercises in gymnastics. The program contains general and comprehensive exercises, as well as exercises (fixed, free, against resistance), and the muscular strength and flexibility exercises. These exercises work to increase muscle tone and increase muscle mass for the back, shoulder girdle and neck. The rehabilitation program works to improve muscle tone, increase its mass, strengthen connective tissue, and increase blood flow in the muscle, and this leads to an increase in the strength of the working

muscles of the neck joint, through the use of static exercises in the first stage, as well as mobile exercises and exercises with resistance until the end of the programme.

The researcher points out that the formal performance exercises of gymnastics increase the flexibility of the joint and thus increase the range of motion for it, and increase the nutrition of the bones so that they grow properly. Besides, these exercises work to increase the elasticity of the muscles working on the joint.

This is consistent with (6) (2012) Bornstien V. Boden that the use of exercises in the form of an integrated program helps to rehabilitate the injury faster, which indicates that the use of dynamic means is better and faster, and then leads to an improvement in muscle work.

As Talha Hossam El-Din, Mustafa Kamel, Saeed Abdel-Rasheed, and Wafaa Salah El-Din (1997) (19) indicate that the practice of negative and positive flexibility exercises achieves lengthening and increases the elasticity of muscles and ligaments. This characteristic works to expand the range of movement of the cervical vertebrae, in addition to increasing the ability to bear the pain caused by prolongation.

This is consistent with the results of the study of Hoving (2006) (9), Aladdin Faisal Khattab Al-Zaidi (2018 AD) (4) that practicing formal gymnastics performance exercises leads to an





improvement in the flexibility of the cervical region, and thus increases its range of motion.

As shown in Table (5), there are statistically significant differences, as well as an increase in the rates of improvement in the research variables between the pre and post measurements in the muscular strength of the back and neck. This improvement may be due to the proposed program, which includes rehabilitation exercises, and these exercises lead to improvement in flexibility and strength of the cervical region and the back. These muscles are the direct reason for determining the extent of the joint, and the development of this leads to the widening of the motor range of the neck.

The researcher attributed this improvement to the group that applied the proposed program of formal performance exercises for gymnastics. This is because their regularity in the three stages of the proposed program, which aims to develop the strength of the back, shoulder and neck muscles and reducing the pressure on the ligaments and muscles, thus reducing pain in the cervical region and returning the vertebrae to the closest they were before the injury.

This is consistent with what was indicated by Muhammad Qadri Bakri (2000) (12) that integrated physical rehabilitation therapy has a positive effect on muscle strengthening, relaxing tense muscles, stimulating blood circulation,

improving muscle tone, relieving pain and improving the psychological state.

Abu El-Ela Abdel-Fattah (1998) (3) indicates that the development of muscle strength leads to an increase in active muscle mass, strengthens connective tissues and the skeletal system and improves body composition.

According to Talha Hossam El-Din, Mustafa Kamel, Saeed Abdel-Rasheed, and Wafaa Salah El-Din (1997) (19) that increasing the range of motion of the neck vertebrae helps reduce muscle tension and pain.

This is consistent with the results of the study of Hoving (2006) (9), Abdel-Majid Awad (2003) (2) that the program of formal performance exercises for gymnastics that includes muscular strength exercises (stationary and mobile) plays an important role in improving the muscular strength of the shoulder muscle group and the area neck, as well as reduce the level of pain sensation.

The researcher believes that diversification within the content of the exercises used in terms of intensity and size had an effective effect in developing muscular strength, based on the opinion of Abul-Ela Abdel-Fattah and Ahmed Nasr El-Din (1993) (3) that the various training doses in size and intensity help to gain more strength. The gradual increase in resistance helps to gain muscle strength and growth.

Thus, the first hypothesis of the research has been achieved, which states



that the program of formal performance exercises for gymnastics positively affects the deviations of the spine and the

strength of the back and neck muscles of people with upper stature syndrome in the sample under study.

Presentation and discussion of the results of the second hypothesis:

Table (5)

The significance of the differences between the averages of the two measurements (before and after) and the percentage of improvement in the level of vital capacity

Variables	unit of measure	Pre - Measure		Post - Measure		"T" calculated	% improvement
		Mean	deviation	Mean	deviation		
vital capacity	Degree	1.73	.017	2.34	.020	5.19	%26.07

* Tabular "T" value at the level (0.05) = 1.761

Discussing the results of the second hypothesis: -

It is evident from Table No. (5) that there are statistically significant differences at the level (0.05) between the mean of the two measurements (pre- and post) for the experimental group in vital capacity and in favor of the post measurement. These differences are due to the benefit of the higher measurement of the post measurement, in vital capacity. This is considered an indication of the effectiveness of the gymnastics formal performance training program in improving the vital capacity of patients with spinal syndrome.

In this regard, Abdel Halim Okasha (2016) (1) asserts that the regularity in implementing the contents of the training program, which has a positive impact on the vital capacity, indicates an increase in the efficiency of the respiratory circulatory system through regular training to improve the efficiency of the respiratory

circulatory system and helps to increase the vital capacity .

Abul Ela Abdel-Fattah, Ahmed Nasr El-Din Radwan (1993) confirm that the practice of physical activity programs which are pre-prepared and based on the scientific method will lead to the development of elements of physical fitness, especially those related to health, such as periodic respiratory endurance, muscular strength (3).

This agrees with the study of Iqbal Rasmi and Amal Zaki (2000) that exercises help in increasing the effects on the cerebral cortex so that they create incentives for the motor system, and affect the growth centers in the nervous system, which activate developmental functions of muscular work. This ,in turn, stimulates the secretion of the hormone adrenaline, which affects the activation of the work of the heart and metabolism. Besides, this helps to raise the temperature of the muscles and their readiness





to work. Moreover, the increase in the acceptable muscle temperature leads to an objective increase in blood, muscle relaxation and the elimination of cases of nervous tension.

Thus, the hypothesis has been fulfilled

Thus, the second hypothesis, which states that the training program using the formal performance exercises of the proposed gymnastics, positively affects the vital capacity of the sample under consideration.

Conclusions:

- 1- The program of formal performance exercises for gymnastics has a positive effect on improving the body shape and muscular strength of the research sample.
- 2- Increasing the improvement in the percentages of the post measurements than the pre in the curvatures of the spine of those with upper stature syndrome.
- 3- Increasing the improvement in the percentages of post measurements than the pre in the vital capacity - the muscle strength of the back and neck of those with upper stature syndrome.

Recommendations:

- 1- Be guided by the proposed rehabilitation program as a preventive measure when rehabilitating people with upper stature syndrome
- 2- Interest in applying the proposed program to all children to reduce the spread of spinal syndrome.

3- Providing the means of measuring and evaluating the strength, which helps in evaluating the students on a regular basis.

4- The importance of expediting early examination of injuries and taking measures in treatment and rehabilitation.

5- Spreading awareness among school children to follow healthy habits.

6 - Limit or reduce the frequent use of computers and mobile devices to avoid any other problem.

References :

1. Abdel Halim Okasha (2013): Education of Textures, unpublished notes, Faculty of Physical Education, Kafr El Sheikh University.
2. Abdel-Majid Abdel-Fattah Awad (2003): "Rehabilitation of the neck muscles after the surgical treatment of cervical herniated disc", unpublished master's thesis, Faculty of Physical Education, Zagazig University.
3. Abu Al-Ela, Ahmed Abdel-Fattah, Ahmed Nasr El-Din Sayed (1993 AD): Physiology of Physiology, House of Arab Thought, First Edition, Cairo.
4. Alaa Al-Din Faisal, Dhamia Ali, Shatha Hazem (2018 AD) : The impact of a proposed treatment program for lumbar curvature on some kinematic variables of the path of weight movement in the squatting flexion for juniors for the first international scientific conference (with sports advancing societies and peace nations prosper) Iraq-Diyala .





5. Ahmed Ahmed Gendi (1995): General Mobility Abilities and their Relationship to Performance of Some Gymnastics Skills for Preparatory Stage, an unpublished Master Thesis, College of Physical Education for Boys, Zagazig University.
6. Bahaa El-Din Ibrahim Salama (2000 AD): Sport Physiology and Physical Performance (Blood Lactate) Arab Thought House, Cairo.
7. Bornstien V. Boden (2012) : Neck Paine Medical Diagnosis and Comprehensive Management Congress Publication Data .
8. Brianezi, L., Cajazeiro, DC. and Maifrino, LBM (2013) : Prevalence of postural deviations in school of education and professional practice of physical education, Laboratory of Human Movement, São Judas Tadeu . University, São Paulo, SP, Brazil
9. chu, D , A (1994) : strength exercises specific to gymnastics , journal of trength and conditioning research , united states .
10. Hamdi Ahmed Abd Al-Ati (2009 AD): “The Impact of Rehabilitation Exercises Program Using Tension for Treating Neck Roughness”, unpublished Master Thesis, College of Physical Education, Tanta University
11. Hoving j J .L. K oes BW. Devet HCW, Vander windt , Seholtzen,(2017) : bouler LM manual theapy physical therapy , continued care by a general practitioner For patients with neck pain annals of internal medicine,med 47 .
12. Iqbal Rasmy , Amal Zaki (2000 AD): The relationship between postural deviations and both psychological compatibility and physical fitness for middle school students in Cairo Governorate, The Scientific Journal of Physical Education and Sports, College of Physical Education for Boys in Al-Haram, P.33, Cairo.
13. Izzat Mahmoud Al-Kashef (1987 AD) : Training in Gymnastics, First Edition, The Egyptian Renaissance Library, Cairo.
14. Mohsen Al-Darwi, Hamdi Abdel-Rahim (2005 AD): Education of strength, College of Physical Education for Boys, Helwan University.
15. Muhammad Qadri Bakri (2010): Sports Injuries and Modern Rehabilitation, The Book Center for Publishing, Cairo.
16. Muhammad Subhi Hassanein (2013 AD): Measurement and Evaluation in Physical Education and Sports, Arab Thought House, Cairo, Part Two, Fourth Edition.
17. Muhammad Subhi Hassanein (2014 AD): The Right Body for All, House of Arab Thought.
18. Nabil Muhammad Muhammad Hassan (2015 AD): Rates of change in both the physical performance and the postural





fitness of Saudi students in the age group from 10 to 12 years, Assiut Journal of Physical Education and Arts, Issue 19, C3.

19. Osama Riad (2001 AD): Physical Therapy and Rehabilitation of Athletes, Arab Thought House, First Edition, Cairo.
20. Samir Muhammad Abu Shady (2009 AD): Some postural deformities and their relationship to the trend towards physical activity for students aged 9-12 in the city of Riyadh, published research, Fourth Scientific Conference, Faculty of Physical Education, Assiut University, Volume 2.
21. Samir Muhammad Mohieldin (2018 AD): A survey study of the most common spinal deviations among middle school students in the New Valley Governorate, Assiut University - Faculty of Physical Education.
22. Talha Hussam El-Din, Mostafa Kamel, Saeed Abdel-Rashid (1997 AD): The Scientific Encyclopedia of Sports Training (Strength, Ability, Endurance, Resilience), Al-Kitab Center for Publishing, First Edition, Cairo.
23. Uday Jaseb Hassan (2012 AD): The statistic condition of students of basic education schools in the city of Mukalla and its relationship to some physical abilities according to mechanical requirements,

