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The effect of special exercises in the aquatic environment on some physical and physiological variables for patients with high blood pressure

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Abstract

The research aims to find out the effect of exercise, especially in the aquatic environment, on some physical and physiological variables for patients with high blood pressure. The problem of the research was that high blood pressure is one of the chronic diseases widely spread in Iraq, which occurs either due to heredity or because of bad habits practiced by humans, including eating food in a large manner. Excessive or lack of sleep or lack of movement, and this is the most influential reason for the spread of high blood pressure disease. During the researchers' follow-up to some hospitals and private internal medicine clinics, they found that most of high blood pressure patients feel early fatigue and an inability to walk or move for short or long periods, and this in turn It greatly affects the completion of daily life duties. The research sample was randomly selected for patients with high blood pressure whose ages ranged between (50-55) years and their number was (20) male patients with this disease. The researchers used the experimental method, as it is the most appropriate method for solving the problem. The research problem: The sample was divided into two groups of equal number, each with (10) patients. Training was conducted for the first group under the supervision of the researchers, and the second group was trained independently, and pre-tests were carried out after the objective of the research was explained to the participants and their approval was obtained formally on the date of (6/3/2023) and the post-tests were on (9/4/2023) in the Spanish swimming pool located in Babylon Governorate, Hilla District in the Al-Iskan area. The tests included some physical variables such as walking (6) minutes and physiological variables such as heart rate, And testing heart effort, high and low blood pressure, and pulmonary ventilation. The researchers concluded that training in the water environment and on a regular basis in swimming pools and under the supervision of researchers affects the variables mentioned above, and that self-training leads to obtaining inefficient results due to the sample's lack of commitment to training on an ongoing basis.

Keywords **exercise, physiological variables, physical variables, high blood pressure patients, exercise in aquatic environment.**

Introduction:

Sports rehabilitation is a science in itself that includes many sciences, whether medical or educational, as the interaction of knowledge in these sciences and their overlap with each other has achieved qualitative progress in the science of sports rehabilitation, which in turn is concerned with studying the rehabilitation aspects for the patient, and this includes the function of the body and its various parts alike. As an integrated unit, it cannot be studied independently. The science of sports rehabilitation is linked to the science of physiology, which is concerned with studying the physiological changes that occur before and after physical effort. As is known, sports rehabilitation leads to the occurrence of many changes, whether they are internal changes, which include physiological changes to the various body systems, or external changes, which include physical changes from the development of

qualities. The patient's general physical condition. (Flynn et al) state, "Sports rehabilitation has become one of the important methods that help in the prevention and treatment of high blood pressure. Previous studies have shown that sports rehabilitation in the aquatic environment for high blood pressure patients leads to a consistent and clinically significant improvement in heart rate." Heart, pulmonary ventilation, blood pressure, and physical ability, which are among the most important indicators that cause death in patients with high blood pressure" (5). Organized sports rehabilitation in water for a sufficient period is also an important and effective requirement in treating the variables that are exacerbated by high blood pressure. A study (Fitchet et al) found that "exercise rehabilitation in the aquatic environment for a period of no less than (8) weeks is one of the basic requirements that contribute to improving the variables associated with high blood pressure" (4). (McMurray et al) mention that high blood pressure is one of the chronic diseases that is widely spread in Iraq because it occurs due to genetic or environmental factors that are affected by rehabilitative exercises in or outside the water environment, but unfortunately many of us try to stay away from rehabilitative sports programs and a number of Few patients implement doctors' recommendations to practice rehabilitative exercises in or out of water. A number of studies have found that walking for (15) minutes a day in water on a regular basis leads to improving heart function and reducing high blood pressure, as confirmed by the International Society. The European community in 2008 stated that regular physical rehabilitation exercises lead to improving physical ability and reducing the rate of admission to hospital due to high blood pressure diseases (10). The lack of specialized centers and lack of healthy education for practicing sports leads to the exacerbation of diseases of all kinds, including high blood pressure. (Massimo et al). conducted a study on the number of patients who participate in rehabilitation sports programs inside or outside the water environment. The sample number was approximately (673) patients from (4) European countries, and they found that only (60%) of patients with high blood pressure They participate in rehabilitation sports programs used for treatment, and (40%) of them were participating in cardiac rehabilitation programs implemented in specialized centers, while the remaining (20%) were following self-training programs without the supervision of specialists. (McMurray et al) point out, "Sports rehabilitation in water is one of the important methods used to improve heart function and improve the health condition of patients with high blood pressure. The European Organization recommends, in order to treat patients with high blood pressure, that aerobic exercises be followed in water because it helps prevent Exacerbation of physiological variables" (10). (Catherine et al) and (Massimo F. Piepoli, et al) believe that "treatment approaches that include drug therapy still fail to improve exercise tolerance, because the special goal of sports rehabilitation is to treat defects that drugs cannot treat, as Continuous follow-up of patients during sports rehabilitation leads to diagnosing errors that may affect the type of exercise and method of performance and thus obtaining better results than performing self-rehabilitation exercises. Hence, the importance of research lies in identifying the importance of exercise in the aquatic environment in improving the physical and physiological variables for patients with high blood pressure. High blood" (9).

Research problem:

High blood pressure is one of the chronic diseases widely spread in Iraq, which occurs either due to genetics or as a result of bad habits practiced by humans, including eating excessive food, lack of sleep, or lack of movement, and the latter is the most influential reason for the spread of high blood pressure.

While researchers were following up on some hospitals and private internal medicine clinics, they found that most high blood pressure patients feel early fatigue and an inability to walk or move for short or long periods, and this in turn greatly affects the completion of the duties of daily life. Also, the use of medications alone to reduce high blood pressure may It results in other side effects that lead to human death, including insufficient oxygen reaching the muscles to produce energy, and because the primary responsible for the energy production processes that occur within the body is the respiratory system and the heart, so researchers found the necessity of improving

muscle function through the use of sports rehabilitation as an alternative treatment for Medications and placing special exercises inside the water environment contribute to reducing high blood pressure and improving the work of the heart and respiratory system, as well as improving some physical variables such as walking and jogging. The research aims to prepare special exercises inside the water environment for patients with high blood pressure, and to identify the effect of special exercises inside the water environment. The aquatic environment in some physical variables (walking for 6 minutes and running on a treadmill) for patients with high blood pressure, and identifying the effect of special exercise within the aquatic environment in some physiological variables (heart rate, blood pressure, and pulmonary ventilation) for patients with high blood pressure, and identifying On the effect of special exercise in the aquatic environment under the supervision of researchers, despite their lack of supervision, on the physical and physiological variables of patients with high blood pressure. As for the research hypotheses, there is a significant effect of special exercise in the aquatic environment on some physical variables (walking for 6 minutes and running on a treadmill). For the experimental group, there is a significant effect of special exercise in the aquatic environment on some physiological variables (heart rate, blood pressure, and pulmonary ventilation) for the experimental group, and there is a preference for the experimental group that was trained under the supervision of the researchers at the expense of the control group that was trained randomly, and the areas were The human field includes high blood pressure patients visiting Hilla Center hospitals and some private clinics for internal medicine doctors, whose number reached (20) patients. The time field is from (3/6/2023) to (4/9/2023). The spatial field is the Spanish swimming pool located in the governorate. Babylon, Hilla district, Al-Iskan area.

Research methodology and field procedures:

Research Methodology: The researchers used the experimental method by designing equal groups with the pre- and post-tests because it is more appropriate for the current study, as the comparison is made between the pre- and post-tests to ensure the improvement of one group with the specific tests, and then the two groups are compared with the post-tests.

Community and sample research:

The research community included (60) patients with chronic high blood pressure who were officially registered in Marjan Hospital / Babylon Governorate - Hilla District. The research sample included (20) patients with chronic high blood pressure, males only, aged (50- 55 years old. They were selected randomly from the research community after reading the report for each of them by the specialist doctor to confirm the type of disease represented by high blood pressure. All patients suffering from additional diseases other than high blood pressure were excluded, so as not to be affected. research results.

Through the above, the research sample was limited to patients who suffer from chronic, stable high blood pressure, whose high pressure rates range between (14-16) milliliters and the low pressure rates range between (9-11) milliliters, and they do not practice rehabilitative exercises inside or outside. The aqueous environment was prepared in advance of their disease, noting that the sample continues to take the medication specified by the doctor for all members of the two groups. The sample was divided into two experimental and control groups, and each group consisted of (10) patients. The patients were also given all information related to their illness and it was recorded and referred to when needed. Official consent was obtained from the patients for participating in the rehabilitation exercises prepared by the researchers. After determining the sample, homogeneity must be calculated so that the sample is equal and with one starting line, as shown in Table (1).

Table .1 shows the homogeneity of the sample

Variables	Measuring unit	Mean	Median	Std. Deviations	Skewness
age	year	52	52.5	5.31	0.59
Length	Cm	169	166	7.97	0.72
weight	kg	86.24	82	6.52	0.68
BMI	kg	26.46	24	3.15	0.51

Table (1) shows the values of the arithmetic mean, standard deviation, median, and skewness coefficient values for sample homogeneity. Since all skewness coefficient values were less than (±1), this indicates that the distribution was moderate and that the sample members were homogeneous.

After homogeneity was achieved, the researchers divided the research sample into two groups, experimental and control, with (10) patients for each group. For the purpose of establishing equality between the two groups in the research variables, the researchers used the T-test, and the results were as in Table (2).

Table .2 shows the parity of the sample in the research variables

Variables	Experimental group		Control group		T value calculated	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation		
Heart rate before stress	90	13.2	88	6.7	1.06	Non sig
Heart rate after stress	190	6.3	187	7.61	1.59	Non sig
Lung function (FEV1)	80.6	3.21	81.9	3.19	1.17	Non sig
High blood pressure before stress	15	2.13	14.5	2.08	1.32	Non sig
Low blood pressure before stress	10	1.30	10.5	1.86	0.85	Non sig
High blood pressure after stress	18	3.16	17.8	3.31	1.92	Non sig
Low blood pressure after stress	11	2.11	10.97	2.33	0.91	Non sig
Walk (6) minutes	440	8.03	445	8.60	2.02	Non sig

The value of T at the level of significance (0.05) and the degree of freedom (18) is 2.07.

Field procedures for research:

Research variables:

The research variables were determined based on the experience of the researchers because they are specialized and the variables are:

- Heart rate
- High and low blood pressure
- Pulmonary ventilation
- Walk (6) minutes

Determine and describe measurements and tests:

After defining the research variables, the measurements and tests that suit the research variables were determined, which are as follows: the heart rate was measured using a pulse oximeter, while lung function was measured using a spirometer, high and low blood pressure was measured using a sphygmomanometer, and physical ability was measured using a walking test. (6) minutes, and finally, a heart stress test using a treadmill. In order to learn how to perform, how to record, and the steps for carrying out measurements and tests, it was necessary to present them in the form of following steps:

First: Cardiac stress and heart rate test

(Stuart RJ) states, "The heart effort and heart rate test is a test carried out by performing physical effort using a stationary treadmill, which aims to increase the load on the heart muscle and thus know the effect of physical effort on blood pressure and heart rate, that is, the amount of blood leaving the heart." To all parts of the body.

- Measurement: The measurement was done before and after the effort through sensors placed directly on the heart, which help in giving a reading of the heart rate" (11).

- Recording: The values appearing on the device screen are recorded.

Second: Measure lung function

The (American Thoracic Society) indicates, "The method for measuring lung function is for the patient to sit on a chair of equal height with the feet touching the ground and the back straight and leaning on the back of the chair. Researchers begin by teaching the sample members the test technique, which is the basis for obtaining good results. This was done by taking Inhale deeply and then exhale forcefully and quickly until one feels that there is no air in the lungs and expels it. The process of inhalation and exhalation was accomplished by the patient placing his lips around a breathing tube connected to a computer" (2).

- Recording method: Exhalation must continue for a period of no less than (6) seconds and continue for (15) seconds or more until the air is completely exhaled and the patient is unable to continue exhaling the air. Three attempts were given to each patient, with a rest period between the tests. And the last one minute, and the best attempt is recorded, knowing that the reading of the attempt appears directly on the display screen and is then printed to become a graph paper, and the unit of measurement is the percentage (%).

Third: Measuring high and low blood pressure

- Method for performing the measurement: The Omron electronic scale is one of the devices used to measure blood pressure, which consists of an inflatable cuff measuring arm circumference from (22) cm to (32) cm, supported by Intelligence technology for quick, comfortable and accurate measurement, which works using one button. It is simple, quick and easy. When performing the measurement, the bladder must be emptied of urine, and a quiet place should be chosen. You should also wait two hours after the main meal. It is recommended not to drink coffee or smoke 30 minutes before the measurement. Avoid any activities before the measurement and sit quietly for a while. (5) minutes before taking the measurement. Tight clothing must be removed from above the upper arm to avoid constriction. The sleeves must not be folded and lifted, as they do not interfere with the air belt if they are placed flat. In addition to the above, the back must be supported straight, the feet must not be intertwined, and no talking. During measurement,
- Recording: The measurement must be done twice with an interval of two minutes, then we take the average of the two measurements, noting that the test was conducted before and after exertion on a stationary treadmill.

Fourth: Physical ability test

- Method for performing the measurement: Before starting this test, the patient must perform a simple warm-up to prepare the body's organs for the effort exerted in the main test. The warm-up includes walking slowly for a distance of (100) meters and returning to the zero (starting) point. The patient also performs simple Swedish movements. For the body as much as possible, such as raising and lowering the arms and moving the hip joint, and taking a rest period for (1) minute, then the participants begin the actual test by walking on flat ground for (6) minutes as quickly as possible and for the longest distance possible.
- Recording method: The distance traveled by the patient during (6) minutes of walking was recorded and the test was performed once.

Pretests:

The pre-tests were conducted on (6/3/2023) after the researchers gave some general instructions to the sample about the importance of the research. The tests were carried out in front of the research sample and the mechanism for correct performance of each test was confirmed. After that, the tests began at ten in the morning and continued for two days as follows:

First day: A test was performed physical ability.

Second day: lung function, high and low blood pressure, heart rate, and a heart stress test were measured.

Main experience:

The researchers prepared special rehabilitation exercises in the water environment for patients with high blood pressure. The exercises included

(walking in the water, walking in the water with the arms raised up, jumping in the water, movement of the legs by fixing the arms on the edge of the swimming pool, and free swimming). The goal is to improve Heart work.

The main experiment for the two groups began on June 5, 2023, with patients attending an introductory session in which they talked about how to perform rehabilitation exercises. A special calendar was prepared to write everything related to the daily training that the participants in the first experimental group carried out, while the second group did not. It is followed up but was directed at the beginning of the program only. Members of both groups completed (45) minutes of rehabilitation with an intensity of (50-60%), and a number of repetitions that suit the patients and then gradually escalated depending on the intensity. The repetitions were determined depending on the patient's ability through the number of total repetitions was recorded until the exhaustion of effort, which is considered an intensity (100%). The time period for the total repetitions was also recorded to benefit from it in knowing the time of each repetition. The arithmetic mean was extracted to know the number of repetitions that corresponds to the intensity with which the patient begins. An example of this is (if the number The total repetitions that the patient performs until exhaustion of effort in an indefinite time is (30) repetitions, which means intensity (100%), but if it is (15) repetitions, this means intensity (50%), (3-5) sets for one exercise, and a period Rest between one exercise and another (3-4) minutes and between sets (4-5) minutes. The researchers relied on the patient's feeling of fatigue as an indicator to determine the inter-rest periods, for period of (4) days a week. The total duration of the program was (10) weeks and the total number of rehabilitation units (40 units, and Table (3) shows a model of a rehabilitation unit.

Table .3 shows a model of a rehabilitation unit

Exercise	Intensity	Performance time	Repetition	Sets	Rest between repetitions	Rest between sets	Rest between exercises	Notes
Walk 25 meters into the swimming pool	%50	130sec	4	2	60sec	80sec	2min	
From a squat position with arms overhead	%50	50sec	10	2	……	60sec		
Walk 25 meters into the swimming pool, moving your arms in a circular motion	%50	130sec	4	2	80sec	100sec		
15m freestyle swimming	%50	40sec	4	2	60sec	120sec		
Swimming underwater for a distance of 5 meters	%50	30sec	2	2	60sec	120sec		

Post-tests: The post-tests were conducted on September 4, 2023, in the same manner as the pre-tests, and are as follows:

First day: A physical ability test was conducted.

Second day: Lung function, high and low blood pressure, heart rate, and cardiac stress test were measured.

Statistical analysis:

In the current research, the researchers used the following statistical treatments:

- T-test for correlated and uncorrelated samples.
- Arithmetic mean.
- Standard deviation.
- Median.
- Skewness coefficient.

Results and discussion:

Presentation, the results of the experimental group for physical and physiological variables

Table .4 shows the arithmetic means, standard deviations, and T value for the correlated samples in tests of physical and physiological variables for the experimental group.

Variables	Pre-test		Post-test		T value calculated	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation		
Heart rate before stress	90	13.2	82	9.01	2.71	Sig
Heart rate after stress	190	6.3	175	5.1	3.91	Sig
Lung function (FEV1)	80.6	3.21	90.2	4.2	2.88	Sig
High blood pressure before stress	15	2.13	12.5	1.06	2.66	Sig
Low blood pressure before stress	10	1.30	8.7	1.85	3.20	Sig
High blood pressure after stress	18	3.16	14	2.13	2.83	Sig
Low blood pressure after stress	11	2.11	9	1.21	2.76	Sig
Walk (6) minutes	440	8.03	720	9.14	2.63	Sig

The T value at the significance level (0.05) and the degree of freedom (9) is 2.57.

The experimental group showed significant improvement and significant differences in all variables of the study. Table (4) shows the pre- and post-tests and the T value for the correlated samples. It appeared that the T values were at a degree of freedom (9) and a significance level (0.05) for the variables of heart rate before and after exertion, and lung function. , high and low blood pressure before and after exertion, and physical ability, which is greater than the tabulated value (2.57). This indicates the significance of the differences between the pre- and post-tests and in favor of the post-test.

Presentation the results of the control group for physical and physiological variables.

Table .5 shows the arithmetic means, standard deviations, and T value for the correlated samples in tests of physical and physiological variables for the control group.

Variables	Pre-test		Post-test		T value calculated	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation		
Heart rate before stress	88	6.7	87.8	6.9	2.03	Non sig
Heart rate after stress	187	7.61	185	7.7	1.87	Non sig
Lung function (FEV1)	81.9	3.19	80.2	3.4	2.03	Non sig
High blood pressure before stress	14.5	2.08	13.4	1.96	1.20	Non sig
Low blood pressure before stress	10.5	1.86	10.2	1.79	1.18	Non sig
High blood pressure after stress	17.8	3.31	16.9	3.01	1.17	Non sig
Low blood pressure after stress	10.97	2.33	10.02	0.57	0.87	Non sig
Walk (6) minutes	445	8.60	450	8.65	1.01	Non sig

The value of T at the level of significance (0.05) and the degree of freedom (14) is (2.57).

Table (5) showed that the results of the control group with the above-mentioned variables did not improve and that there were no significant differences in the study variables. The table showed the pre- and post-tests and the T value for the correlated samples at a degree of freedom (9) and a significance level (0.05).

Presentation the results of the experimental and control groups for physical and physiological variables.

Table .6 shows the arithmetic means, standard deviations, and T value for unrelated samples in tests of physical and physiological variables for the two groups.

Variables	Experimental group		Control group		T value calculated	Type Sig
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation		
Heart rate before stress	82	9.01	87.8	6.9	3.01	Sig
Heart rate after stress	175	5.1	185	7.7	3.5	Sig
Lung function (FEV1)	90.2	4.2	80.2	3.4	2.81	Sig
High blood pressure before stress	12.5	1.06	13.4	1.96	3.36	Sig
Low blood pressure before stress	8.7	1.85	10.2	1.79	3.10	Sig
High blood pressure after stress	14	2.13	16.9	3.01	2.77	Sig
Low blood pressure after stress	9	1.21	10.02	0.57	3.19	Sig
Walk (6) minutes	720	9.14	450	8.65	2.87	Sig

The value of T at the level of significance (0.05) and the degree of freedom (18) is (2.23).

Table (6) showed that there were significant differences between the post-tests for both groups and in favor of the experimental group, as it was shown that the T values for the research variables represented by (heart rate before and after the effort, lung function, high and low blood pressure before and after the effort, and physical ability)

Discussion:

The members of the experimental group showed a high commitment to practicing rehabilitation exercises when compared to the members of the control group. The members of the experimental group completed (4) rehabilitation units per week, meaning approximately (180) minutes per week. Therefore, the exercises used led to improving the health condition of patients with high blood pressure the blood. (Howley) also confirms, "Commitment to low-intensity rehabilitation and training leads to improving the physical and physiological variables in patients with high blood pressure" (7). (Boule et al) also added that the aforementioned stresses lead to a change in the level of the cardiac circulatory system (3: 1071-1081). Some studies, such as the study by (Thomas et al), have also confirmed "patients exercising in a water environment leads to good results, which is similar to what the researchers found in the current study. The reason for this is that exercise can be used as a therapeutic aspect for many diseases, including blood pressure." " (12).

As (Ades et al) state, "The sports rehabilitation that takes place in the aquatic environment is greatly effective in reducing the heart rate during exertion and improving its level during rest. The reason for this is that adaptation to the work of the heart contributes, at least partially, to improving cardiac output" (1). (Goldberg et al) also confirms "people aged 55-65 years adapt to training by improving the movement of venous and arterial blood, in the physical ability test (6) minutes of walking. There appeared a significant difference in favor of the experimental group due to the increased interest by The sample and commitment to sports rehabilitation in the water led to this important increase, as well as due to the type of rehabilitation exercises that were carefully prepared by the researchers to have a greater impact on the research sample. Previous studies have shown a significant increase in physical ability in blood pressure patients after organized rehabilitation exercises" (6)

As (Kirsten et al) state, "The data we obtained in our current study are consistent with what was announced by the American Public Health Organization, which suggested that rehabilitation for (30) minutes to (90) minutes leads to improved heart function. In one study, it appeared that training outside Water leads to improvement of the heart muscle, and the data of our study confirm that (180) minutes of rehabilitation per week at low intensity is required to improve the work of the heart and thus improve high and low blood pressure. As for the other variables of the study, which are blood pressure before and after exertion and pulmonary function, we find there the experimental group improved more than the

control group in the post-tests. The researchers attribute this to the great commitment to practicing exercises in the water environment and not leaving the rehabilitation units for long periods, which was the direct reason for the lack of development in the control group. Therefore, the results were not motivating for the researchers to support the idea of relying on the drug. Only to treat blood pressure patients because it gives poor results and does not help improve physical and physiological variables" (8).
As it is mentioned in similar studies (13) , (14) , (15) .

Conclusions:

Through the results obtained, the researchers concluded that exercise in water affects physical ability, high and low blood pressure, lung function, and heart rate. The researchers also concluded that relying on medications alone leads to unsatisfactory results.

References:

1- Ades, P.A., Waldmann, M.L., Meyer, W.L., Brown, K.A., Poehlman, E.T., Pendlebury, W.W., Leslie, K.O., Gray, P.R., Lew, R.R. and LeWinter, M.M. (1996). Skeletal muscle and cardiovascular adaptations to exercise conditioning in older coronary patients. Circulation 94(3), 323-330.
2- American Thoracic Society, (1983). Screening for adult respiratory disease, Am Rev Respir Dis, 128:768–774.
3- Boule, N.G., Kenny, G.P., Haddad, E., Wells G.A. and Sigal, J. (2003). Meta-analysis of the effect of structured exercise training on cardiorespiratory fitness in Type 2 diabetes mellitus. Diabetologia 46(8), 1071-1081.
4- Fitchet, A., Doherty, P., Bundy, C., Bell, W., Fitzpatrick, A. and Garratt, C. (2003) Comprehensive cardiac rehabilitation programme for implantable cardioverter-defibrillator patients: a randomised controlled trial. Heart 89: 155–160.
5- Flynn, K., Pina, I., Whellan, D., Lin, L., Blumenthal, J., Ellis, S. et al. (2009) Effects of exercise training on health status in patients with chronic heart failure: HF-ACTION randomized controlled trial. JAMA 301: 1451–1459.
6- Goldberg AP, Geltman EM, Gavin JR 3rd, Carney RM, Hagberg JM, Delmez JA, Naumovich A, Oldfield MH, Harter HR: Exercise training reduces coronary risk and effectively rehabilitates hemodialysis patients. Nephron 1986, 42(4):311-316.
7- Howley, E.T. (2001). Type of activity: resistance, aerobic and leisure versus occupational physical activity. Medicine and Science in Sports and Exercise, 33(6), S364-369.
8- Kirsten P Koh, Robert G Fassett, James E Sharman, Jeff S Coombes and Andrew D Williams (2009). Intradialytic versus home based exercise training in hemodialysis patients: a randomised controlled trial, BMC Nephrology, 10:2, 1-6.
9- Massimo F. Piepoli, et al., (2011). Exercise training in heart failure: from theory to practice. A consensus document of the Heart Failure Association and the Eur opean Association for Cardiovascular Prevention and Rehabilitation, European Journal of Heart Failure, 13, 347–357.
10- McMurray, J., Adamopoulos, S., Anker, S., Auricchio, A., Bohm, M., Dickstein, K. et al. (2012) ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association (HFA) of the ESC. Eur Heart J 33: 1787–1847.
11- Stuart RJ Jr, Ellestad MH, (1980). National survey of exercise stress testing facilities. Chest, 7, 77:94.
12- Thomas, D.E., Elliottet, E.J. and Naughton, G.A. (2006). Exercise for heart failure patients. Cochrane Database of Systematic Reviews, 3(2), 23-33.
13- Tahir, S. A. Al selmi, A. D. H. (2023). The Effect of a Training Curriculum According To the Physiological Index and the Transitional Speed of the 100m Hurdles Runner. Revista iberoamericana de psicología del ejercicio y el deporte, 18(3), 259-262.

https://www.scopus.com/record/display.uri?eid=2-s2.0-85166317191&origin=resultslist
14- Al-Nedawy , R. I. A. ., & Saeed Al-Mousawi , S. Q. (2022). Effect of a training program on the development of physical abilities in football goalkeepers. SPORT TK-Revista EuroAmericana de Ciencias del Deporte, 11, 36. https://doi.org/10.6018/sportk.522961
15- Shbeeb, H. B., Almousawi, S. Q. S., & Jawad, S. M. (2023). Analysis of the amount of lost fluids, some blood components and mineral salts in volleyball under hot weather conditions. SPORT TK-Revista EuroAmericana de Ciencias del Deporte, 36-36. https://www.scopus.com/record/display.uri?eid=2-s2.0-85169810765&origin=resultslist

تأثير تمارين رياضية خاصة داخل الوسط المائي في بعض المتغيرات البدنية والفسيولوجية لمرضى ضغط الدم المرتفع

هبه محمود إبراهيم حسين 1 ، عمار حمزه هادي 2 ، أحمد حمزه حسن 3
1 جامعة المستقبل/ كلية التربية البدنية وعلوم الرياضة
2 &3 جامعة بابل / كلية التربية البدنية وعلوم الرياضة

مستخلص البحث

يهدف البحث لمعرفة تأثير تمارين رياضية خاصة داخل الوسط المائي في بعض المتغيرات البدنية والفسيولوجية لمرضى ضغط الدم المرتفع وكانت مشكلة البحث أن مرض ضغط الدم المرتفع من الأمراض المزمنة المنتشرة بالعراق بشكل كبير والتي تحصل أما بسبب الوراثة أو نتيجة العادات السيئة التي يمارسها الأنسان ومنها تناول الغذاء بشكل مفرط أو قلة النوم أو قلة الحركة وهذا يعد السبب الأكثر تأثيراً في أنتشار مرض ضغط الدم المرتفع وأثناء متابعة الباحثين لبعض المستشفيات والعيادات الخاصة لأمراض الباطنية وجدوا بأن معظم مرضى ضغط الدم المرتفع يشعرون بالتعب المبكر وعدم القدرة على تحمل المشي أو الحركة لفترات قصيرة أو طويلة وهذا بدوره يؤثر بشكل كبير في أنجاز واجبات الحياة اليومية وقد تم أختيار عينة البحث بالطريقة العشوائية لمرضى ضغط الدم المرتفع والذين تراوحت أعمارهم ما بين(50-55) سنه وعددهم (20) مريض من الذكور المصابين بهذا المرض، وأستخدم الباحثين المنهج التجريبي كونه أكثر المناهج ملائمة لحل مشكلة البحث، إذ قسمت العينة إلى مجموعتين متساويتان بالعدد كل منها (10) مريض وتم إجراء تدريب المجموعة الأولى تحت مراقبة الباحثين والمجموعة الثانية تم التدريب بشكل ذاتي، وتم تنفيذ الأختبارات القبلية بعد أن تم شرح الهدف من البحث للمشاركين والحصول على موافقتهم بشكل رسمي في تاريخ (2023/6/3) والأختبارات البعدية كانت بتاريخ(2023/9/4) في المسبح الأسباني الكائن في محافظة بابل قضاء الحلة في منطقة الأسكان، وقد تضمنت الأختبارات بعض المتغيرات البدنية مثل المشي (6) دقائق والمتغيرات الفسيولوجية مثل معدل ضربات القلب، وأختبار جهد القلب وضغط الدم العالي والواطئ والتهوية الرئوية، وأستنتج الباحثين بأن التدريب داخل الوسط المائي وبشكل منتظم في حمامات السباحة وتحت أشراف الباحثين يؤثر في المتغيرات المذكورة أعلاه كما أن التدريب الذاتي يؤدي إلى الحصول على نتائج غير كفؤة وذلك لعدم التزام العينة بالتدريب بشكل مستمر.

الكلمات المفتاحية | **التمارين الرياضية ، المتغيرات الفسيولوجية ، المتغيرات البدنية ، مرضى ضغط الدم المرتفع ، تمارين رياضية داخل الوسط المائي.**