The effect of therapeutic swimming using an innovative device for lower back pain

Akhlas Hussein Daham Mamouri
Professor
Ministry of Higher Education and Scientific Research
Mustansiriya University
College of Physical Education and Sports Sciences
E-mail: hashimyassr965@yahoo.com

Introduction and Importance of Research:

As a result of the technological development witnessed by the world, this led to the movement of the person with very narrow limits and according to the nature of his work and his life during the day, making the machine a great role to spend his work in addition to standing and sitting and wrong movements, and the pressures of psychological life may lead to muscle tension and what it causes From fatigue, stress and pain to the lower back, as the human was unable to take advantage of his free time to engage in sports and recreation, but go to sleep and rest and lethargy ... All this led to an increase in the number of people with back pain not only in Iraq but in the world Collect.

Swimming is one of the best sports activities through which the treatment of non-lumbar spine can not work as a natural mechanism to relax the muscles rigid and convulsive through the water medium only, as well as to strengthen the working muscles and backbone of the spine in general and back muscles with special images and the expansion of the paragraphs and non-compression and exit of the existing liquid Between the paragraphs during the stand for many hours of work, as swimming to activate the heart and the circulatory system and what brings him pleasure and pleasure to practice this type of activity.

The importance of this research lies in the design of an auxiliary device for the practice of exercises in swimming in the water not only for those who know swimming but for non-practicing swimming through the strengthening and flexibility of the muscles choking the spine, in addition to massage and relaxation of these muscles and reduce the resistance resulting from weights on the vertebra and thus alleviate Pain down the back.

problem of Research:

Many people suffer from low back pain and treatment of this condition must be the exercise exercises to strengthen the muscles supporting the spine and at the same time does not cause pain in the performance or inability of the patient to do it is a problem must be standing for them, the most important points of the conditions of treatment Lower back pain is the lack of exercises that lead to the feeling of pain resulting, for example, from resistance to body weight, and this is done only in the water medium as the body loses weight as much as the weight of the juggling fluid (the base of Archimedes).

aims of research:

1 — Design of a proposed device for lower back pain.

2 — Preparation of exercises for therapeutic swimming using the innovative device.

3 — Knowing the effect of therapeutic swimming using the innovative device in the flexibility and strength of the muscles of the back and lower back pain.

Imposition of search:

1 — There are hypotheses of statistical significance and for the benefit of the tests of the

experimental group of tests in the tests flexibility and strength of the muscles of the back and lower back pain.

Theoretical Studies:

Theoretical studies and similar studies:

theoretical studies:

therapeutic swimming:

Since ancient times humans have used water basins to take advantage of the chemical and physical properties of water in treatment, either by controlling the concentration and dissolving of some substances in it or by changing the temperature and pressure, or using it naturally, and then use exercise in the water treatment, to take advantage of the float in water to reduce the effect Gravity on the body structures, especially the skeleton so that the movement is easy, and water resistance is useful to strengthen the muscles capable of movement or help the weak muscles to benefit from the phenomena of buoyancy and adverse reaction, Exercise in the water and the movements of swimming freely, even if the individual does not know swimming what is required of it only some specialized in water exercises with the possibility of floating in it, as an individual one-third of its weight in water to be and has a greater chance to strengthen his muscles and move and move his joints without straining.

Studies and experiments have shown that the basis of treatment resulting from the therapeutic and motor therapeutic effect is to restore the basic functions of the body of the injured, which is primarily referred to by the nervous system.

The nervous system determines the reactions of the various organs of the body through the pain, and can alleviate the pain resulting from a defect in the motor system by using a different environment is the water environment and away from the nature caused by the environment surrounding the injured, and the possibility of motor performance by swimming in the water center of swimming Among the benefits of several of them: -

1 — Improve the level of physiological functions of different body members, as the idea of functional arousal reflects the therapeutic effects on the body as a whole in various aspects (hormonal, nervous, lymphatic).

2 — Improve the psychological and emotional state of the injured, the first steps to heal the patient and the subsequent implementation of the program of motor.

3. The nervous system and the muscular system together represent a mechanical importance, by improving the internal functional condition of the motor performance of muscle activity and processes of muscular compatibility.

4 — The practice of motor therapy with swimming activates from the control of body fluids in the muscles and between the joints.

5 — The possibility of the patient to perform swimming exercises to activate the circulation of blood circulation, which helps in its role in the delivery of oxygen and food to muscle tissue, especially infected tissues, in addition to the reconstruction and repair of infected tissues.

The lymphatic system deals with the large particles of internal leakage products that are difficult to penetrate by the walls of the capillaries as they deal with them and rid the body of them.

7 — By swimming can reduce the pain resulting from weakness of the muscles and can not be strengthened by the patient only to get rid of the resistance to the weight of his body and not only in the water as the body loses weight as much as the weight of the joke.

As stated "Therapeutic swimming helps the weak muscles move when the individual floats above the

water. Water resistance acts as a moderate form of resistance, which seeks to restore the swimming pool. The body is vital after the state of general weakness, “and important points if the most important is that the proportion of safety in the treatment of swimming exercises as a resistance in water far more than other treatments (Anwar Fathi, 2009).

Advantages of therapeutic exercises in water: -

1 — feeling comfortable with the length of treatment in water due to increased secretion of adrenaline, and increase the cycle of anaerobic biochemical.

2 — the disappearance of the mother of muscle contraction and increase mobility easily and relax.

3. The pool provides the opportunity for a precise step in the physical effort of weak muscle groups.

4- Increase the mobility and maneuverability of the patient who is unable to move above the ground.

5 — Provide the possibility of treatment due to the impact of water resistance on the moving parts during it.

6. Initial start positions can be used to reduce the impact of weight, which is impossible outside the swimming pool.

7 — Freedom from clothing that impede movement.

8 — pleasure during the treatment of psychological and recreational.

Therapeutic exercises in the water are also used with great success in the treatment of Rome supports and inflammation of the articular and cartilage as well as injuries to different parts of the body and rehabilitation of muscles, and also used successfully in the treatment of some neurological and psychological diseases. (Reham Kilani, 2002).

-lower back pain

Many people complain of low back pain because of our daily habits and because of the wrong habits such as carrying heavy objects without creating the body and standing and sitting for long periods

The most important causes of low back pain:

1. Muscle spasm of the spine muscles The main cause of the lower back pain caused by spinal nerves is the type of injury that is caused by the backlash of the muscles to protect the nerves.

2 — muscle tension resulting from some sudden movements without the formation of the body.

3. Inactivity and weakness that affect the muscles of the lower limb (the muscles of the front and back thighs).

4 — high effort on the spine.

5 — weakness of the muscles associated with the trunk.

6. Accidents and resulting bruises on the spine.

7 — Mechanical work that requires great effort to accomplish.

8 — move one of the paragraphs and their emergence, which works to pressure the nerves causing pain in the lower back extending to the hips and thighs called sciatica.

9 — There is a defect in the structure of the spine as a torn ligament or sliding some cartilage generates pain in the lower back due to pressure on the nerves.

10 — the presence of congenital defects in the spine since birth (curvature, defiance, paralysis) which cause severe pain in the back and bottom.

11. Osteoporosis caused by a deficiency of calcium and bone mass, which may be broken at any

time or when any effort and these fractures may lead to severe pain.

12 — Arthritis, such as osteoarthritis, which increases the pressure around the vertebrae, causing severe pain.

13 — overweight (obesity) that causes increased pressure on the spine and muscles and generates pain in the lower back.

14 — the presence of some diseases of bacterial infection or benign tumors or malignant may be infected by the spine and may cause him some pain.

15 — Pregnancy and increase the size of the fetus especially in the last months of pregnancy.

16 — Sit for long periods of work without taking enough rest.

17 — The absence of gels that soften the joints and lubrication, which leads to roughness of the joints and friction.

18 — some infectious and non-communicable diseases and the pain of internal organs (kidney, and gynecological).

The lower back pain is divided into the following:

1. Acute back pain — occurs as a reaction to low body temperature.

2. Chronic back pain — a pain that occurs as a result of excess pressure on the spine of excess weight, the person who exercises the work sitting for hours or continuous standing for long periods.

3. Sciatica (low back pain and stretch to the leg) — One of the serious symptoms of cartilage slide disease, this requires immediate treatment.

What concerns us here is the simple chronic pain in the lower back, and this pain may be not only weakness of the muscle, but the result of weakness in the electrical activity of the muscle through muscle contractions weak muscle appears electrical activity at low frequencies caused by a few units of mobility, During strong muscle contractions, the electrical muscle is more efficient depending on the following:

• Increase in excitation per motor unit.

• Increasing the number of synchronized motor units

Schmidt emphasized that electrocardiography is the process of recording the electrical activity of the muscular muscle.

EMG can be used functionally:

1 — as an indicator of the beginning and end of muscle activity.

2 — as an indicator of the strength produced by the muscle.

3 — as evidence of the fatigue that appears on the muscle.

“Neural stimulation of skeletal muscle gives a clear indication of the magnitude of muscular involvement in muscle contraction,” James and Jones said. “The more muscle stimulation and the muscular response to the muscle, the more muscle fatigue and skeletal muscle contraction would be optimal”.

Muscle action potential, is transmitted as a wave. This stimulation can be done through different devices, so the researcher saw the design of a device that reduces the pain of the lower back and reduces the burden on the muscles when using swimming exercises.

(Lower back pain also occurs due to the lack of fitness elements, including the lack of elasticity of the muscles and ligaments on which the spine is based — the mechanisms and thighs — and also the elastic factor, which is an easy axis of the movement of the body parts around the joints associated with it.

The strengthening of the back muscles is a factor in avoiding these pains. Brown Jakson takes the theory that back muscle strengthening exercises reduce the disability associated with back pain or dysfunction. The muscles of the abdomen, back, shoulders and hips, which contribute to balance, The weight of the body and reduce the burden on the spine and it includes more than 40 muscle and the most important of these muscles are:- The muscle attached to the trunk in the lower back that extends to the top and this supports the balance of the basin

— External and internal abdominal muscles that work together to rotate the trunk and bend the trunk of both sides

— Muscles in the lower abdominal region that support body balance

— The abdominal straight muscles consisting of (6) straps and the trunk bend forward

— A lot of muscles associated with the control and control of the trunk and pelvis, such as that which flex and extend the hip

These muscles work together to do a lot of movements, and also provide stability and balance of the spine and pelvis (Dave & Scott.2008.88).

It is necessary to give strength exercises to the trunk muscles of the back muscles and muscles of the abdomen as well as strengthening the muscles surrounding the spine through strength and strength, as well as increase the flexibility of the spine (range of movement) as those interested in the exercises after physical injuries are exercises flexibility of factors Essential for maintaining the health of the individual, especially in back pain injuries resulting from the lack of flexibility of the joints of the body).

These three qualities can not be achieved because they are of great importance in the prevention and treatment of lower back pain and spinal injuries except by using therapeutic swimming. “Swimming helps weak muscles move when the individual floats above water. Water resistance acts as a moderate form of resistance, Its vitality after the general weakness. ”

Methodology and field research:

1- Research Methodology:

The researcher used the experimental method (one group with the tribal and remote tests) to suit the nature of the research.

2. The research community and its design:

The research community was chosen in a deliberate manner and included lower back patients, swimming and specimen users aged 40 to 35 years and 6 patients. The symptoms of pain were at least three months and were identified in cases of tension, convulsion, fibrosis, muscular weakness, muscular dystrophy, (Eat cartilage discs or damaged) or any severe cases.

3. Means, equipment and tools used in research:

— Arab sources and foreign sources

— Personal interviews

— Tests and measurement

— Registration form for test results

— Statistical means

— International Information Network Scientific calculator type {Casio} Japanese-made.
— A table with a ruler included in the middle to measure flexibility.

— 25m swimming pool. 8 m.

— Swimming pools measuring 10 cm. 20 cm number (6).

— Innovative device number 2.

— Tests used in research

— Flexibility of the back muscles. (Test torso bend-down)

From the standing position on the table of bending the trunk down and down, the reading is calculated by the centimeter.

— Power extension of the extensor muscles of the back, (head lift test and shoulders of the abdomen)

From laying position, arms and hands behind the hips, neck and head in a level position, lift the shoulders from the ground for as many as possible until fatigue.

— Lower back pain (lower back pain test).

It is a straight 5 cm long, divided into five equal parts and numbered from 0 to 5, the first of which indicates the absence of pain, the other extremity to the maximum pain, and the other numbers indicate the pain gradient, the level of pain is measured from the lying position And the meter according to the measurement form.

Innovative device:

In designing the device, the researcher took advantage of the physical property of the water from the work of small vibratory water currents for the muscles of the back, which aims to relax the muscles during the rest periods after each exercise,

Vest vest.

2. Battery 12 Volt to operate plungers.

3 — 12 volts for the operation of plunger Plunger motor 12 volt.

4- Water hose (60 cm) water hose (6cm)).

5 — Aluminum tubes perforated spiral of two pieces.

6. Battery Charger.

The device inserts the plunger into the vest and is connected to the tube connected to the tube inside the vest and connects to the knee to operate from the outside.

When operating the device works to draw water from the pool basin and passes through the hose to the pipes and comes in the form of a douche on the dorsal muscles and the patient is in the position of sitting in the water during rest.

Battery12 Volt to operate plungers

ماتور غطاس (١٢ فولت)

Plunger motor 12 volt

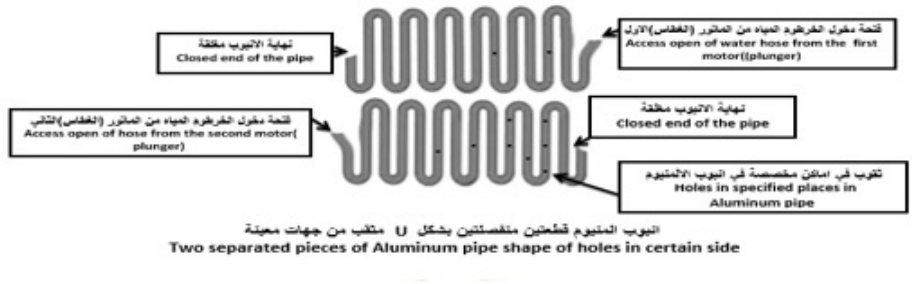
تضبيدة ١٢ فولت لتشغيل الغطاسات

water hose(6cm)

خرطوم مياه (٦٠ سم)

Battery charger

شاحن تضبيدة



البوب المنيوم قطعتين منفصلتين بشكل U مثقب من جهات معينة

Two separated pieces of Aluminum pipe shape of holes in certain side

		AM	D	AM	D	CA	TB
1	Test back flexibility	22.6	1.93	59.4	0.80	40.57	1.83
2	Stress test the power of lying down	3.0	0.83	10.5	1.87	11.18	1.83
3	— Test the level of pain	4.02	0.59	0.56	0.15	14.76	1.83

Discussion of results:

The following tables and figures show the significance of the statistical values due to the obvious development in elasticity of the back muscles. The researcher attributes these results to the nature of the exercises used. Therapeutic exercises for therapeutic swimming. The moral of the elastic variable is the result of stationary and dynamic exercises. The body in the exercise of buoyancy and flow as well as exercise squatting, which works to increase the flexibility of the joints and ligaments and muscles working on them, as the exercises flexibility to return the injured joints to normal movement after determining the range The movement of the joints resulting from the incidence of pain in the lower back due to muscle spasm, which impedes the movement of the joint due to pain resulting.

The researcher attributed the evolution in the status of strength to the specificity of the performance of exercises strength and balance of muscles surrounding the center of the body and surrounding the trunk, which is characterized by the strength of strength using constant tensile exercises and mobility in buoyancy and flow and swimming, as training and training in the water medium has a positive impact on improving and increasing the range of motor And muscle strength with the ability of the injured to move in the middle of the water without heavy burdens on the joints of the body different “(Reham Ezz Eddin, 2002), also emphasizes (Allawi) that” the orderly training leads to the efficiency of the muscular system and shows clearly in the ability of the muscle to contract B Dl faster during the range of motion of the joint, whether this kinetic force or fixed. “

Finally, with regard to the level of pain, it is clear from the presentation of tables and figures that there is a significant difference in the degree of pain in the post-test, as the percentage of pain in the post-test significantly decreased than in the test tribal.

The researcher attributed this difference to the special training exercises which included a group of gradual exercises that had the effect of increasing the length of some muscles and the flexibility of some

other muscles, and this reflects the validity and relevance of the vocabulary of those exercises to reduce pain (lower back) in the members of the research sample. This indicates that the exercises have helped to relieve pain in terms of removing spasticity and stiffness as a result of the pain and also helped Tarat water on the dorsal muscles to massage the body and treatment of joint and muscle injuries. The exercises increased the strength of the working muscles and the ability to bear the burden on them. Therefore, the degree of pain has decreased as one of the benefits of therapeutic swimming that "reduce the manifestations of pain in the muscles and joints and thus help the normal movement and prevent the occurrence of deformities."

Hydrotherapy is also an effective treatment in diseases of the nervous system and other diseases and other purposes (Riham Kilani 2002 p. 126).

CONCLUSIONS:

One of the most important conclusions reached by the researcher

1. The practice of therapeutic swimming helped to develop the flexibility of the spine and the strength of the strength and the low level of pain in the injured.

2. The therapeutic swimming using the innovative device has worked to rehabilitate people with low back pain

3. The treatment of motorized exercise exercises using one of the basic natural means for the purpose of integrated treatment is of particular importance in the field of rehabilitation.

52 Recommendations:

1 — rely on therapeutic swimming to rehabilitate people with low back pain.

2 — the need to emphasize in the rehabilitation curriculum for people with back pain on the gradual therapeutic exercises for the purpose of the patient to cope with spasm and stiffness as a result of pain.

3 — Conduct similar studies and research in the rehabilitation of various physical injuries.

4 — interest in the establishment of training courses therapeutic swimming pool for specialists (swimming, rehabilitation), because of its great importance in the field of physical therapy.

The References

1. Abdullah Mahmoud Rabaya: Basic Concepts and Concepts in Swimming, Jordan, Arab Community Library, 2013, p49
2. Schmidt,R.:**Motor control and learning human,** publisher Champaign Illinois,USA,1989 ,p.44.
3. DavidW. and Jhon W.:**Biomechanics and Motor Control of human movement,** 2nd, Leisure Publishing Company, NEW YORK, 1990 , p.68.
4. James C.& others: **loss of power during Fatigue of human leg muscles physiology,** national library of health, LONDON, 1995, p.237.
5. brahim Al Basri. Football Injuries, Baghdad: Progress Press, 1987.
6. Jakson. C .p .p. and Brown MP; is there arole exercise in the treatment of patients Co ,inc 1982.
7. Wadih Yassin Mohammed Ali, The physical numbers of women. Mosul: University Press, 1986.
8. Abdullah Mahmood: Source cited above.
9. Journal of Technical, Volume XXVII. Number 2, 2012, p17.
10. Journal of Physical Education Sciences, University of Babylon, Volume 4, Volume IV, 2005.
11. Mandelawy, Qassem Hassan and others, tests, measurement and evaluation in physical education, University of Mosul, Higher Education Press, 1989, p. 107.