

POSSITIVE EFFECTS OF MOVEMENT PERFORMED IN WATER

Fabiana MARTINESCU-BĂDĂLAN

“Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania
martinescu_fabiana@yahoo.com

Ramona-Elena HERMAN

“Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania
ramoherman@gmail.com

ABSTRACT

Given the effects that swimming has on the body, the improvement of general health and recreation, it can be considered a mass sport. It can be practiced from the first months of life to old age, because the effort can be modified at least according to age and health.

It is one of the most complete sports because of the changes it brings to the body as well as the hygiene conditions in which it is practiced. It is beneficial to all functions, organs, exerts an increased demand for all muscle groups as well as general body attitude.

Swimming is recognized as a very enjoyable, relaxing and prophylactic activity that almost everyone can enjoy.

KEYWORDS: effect, movement, water

1. Introduction

“Swimming is confused with the early times of humanity, being present in all times and all populations. Swimming is important in the development of the child by helping to increase muscularity, motor coordination, cognitive abilities and ways of social interaction” (Kari, 2012).

“Human civilizations, such as the Mesopotamian, Egyptian, Chinese, Indian and Greek were established beside waters, along rivers and seas, and this developed close ties with the life-giving water” (Bíró, Révész and Hidvégi, 2015). Antiquity populations have rapidly noticed the positive effects of swimming and used them in military and training programs, as well as in education.

As with any other physical activity, when you start practicing swimming regardless of the fact that you are currently

physically well prepared or someone who has not exercised consistently for a long time, it is advisable to consult your doctor.

Swimming is a recognized tonic for both muscle and brain. It is also a form of low-risk exercise with benefits for people with limited mobility or other physical problems. Exercises in water can also be very useful for people recovering after a particular injury, both for performance athletes and for the regular population.

A very important reason why everyone should learn to swim is that this ability could someday save your life or help save someone else in a dangerous situation in the water.

“(…) the humid atmosphere around pools as well as the swimming itself can be beneficial to some people with certain types of asthma. Like all medical information, it won’t apply equally to everyone and you

should always consult your doctor or specialist before undertaking any form of exercise” (Palmer, 2010, p. 7).

Swimming really became a science only in the nineteenth century. More precisely, in the last half century alone, it was considered very important.

At present, swimming is appreciated as an indispensable help to educate the youngsters.

Due to the numerous changes it makes in the body, swimming is one of the most complete sports; strength, speed, and mobility (flexibility) are favored. Swimming activities are divided into four categories:

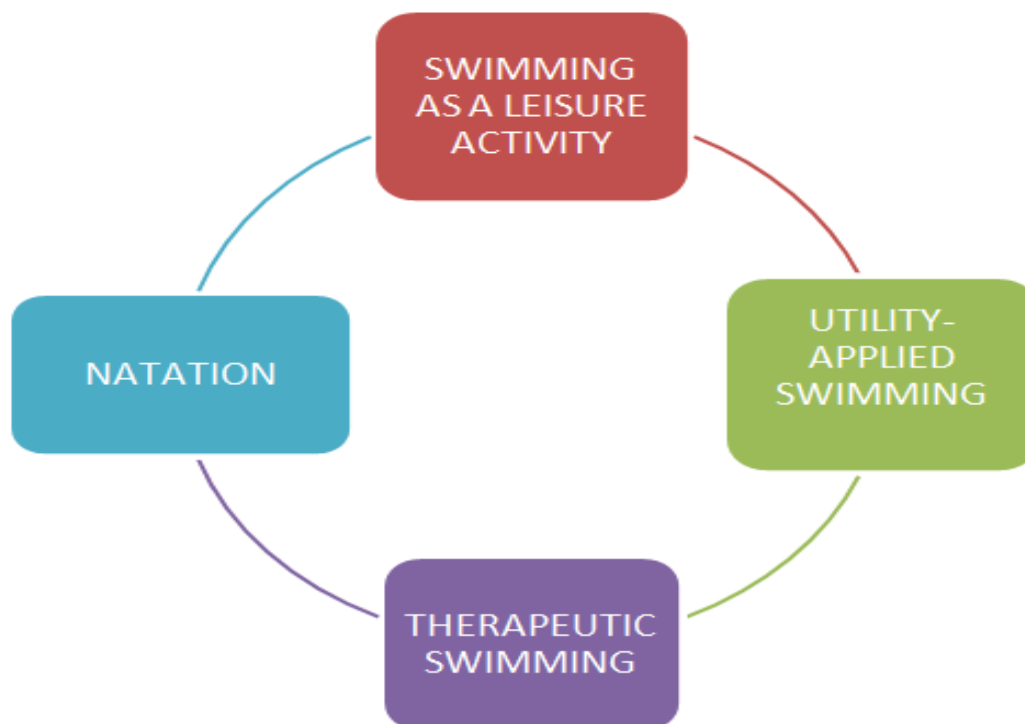


Figure no. 1: Swimming activities

Sport in general and swimming in particular have positive effects on the human body. Next, we will try to present some of the effects of swimming:

- developing positive character traits, such as: courage, firmness, tenacity, patience, the desire to compete with yourself;
- the educational side evolves in the sphere of fair play, discipline, order, respect;
- is a social phenomenon; it may be practiced in spare time, to improve the individual's physical and mental health.

Because water has a higher conductivity than air, it exerts a very strong action on the thermo-adjustment ability of the human body. Thermo-adjustment has the following definition in the Explanatory Dictionary *“physiological mechanism by which the body temperature is maintained constant”* (Academia Română, 2009)

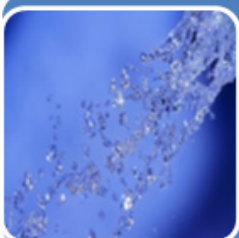
The medium of movement, depending on the water temperature itself has a refreshing, invigorating effect when it is cold or cool, and a refreshing, relaxing effect when warm (Bíró, Révész & Hidvégi, 2015).

Conditioning the body with water, or strengthening it is done with the following procedures:



Rubbing with a wet towel

- it is usually done in the morning, after the morning sports;
- at the beginning, the towel is soaked in water at a temperature of 20-25°C, dropping every 2-3 days with a degree, until it reaches the room temperature.



Splashing or pouring water on your head

- at first, water with a temperature of 33-35°C is used, which gradually decreases to 20°C. The duration is 1-2 min;
- the temperature in the room is gradually reduced until it reaches the temperature outside then you can start splashing with water from the air.



The shower

- upper conditioning means with water;
- works by water temperature and massage effect;
- the cold shower is practiced after the body has relaxed after effort. Skin must be warm but not sweaty;
- after the shower it follows the massage or the self-massage;
- duration of the shower 1-2 minutes.



Bathing (going for a swim)

- has the greatest conditioning effect;
- rapid entry into the water with the whole body surface plus air, sun, water pressure and water movements make bathing a major quencher of the body.

Figure no. 2: Procedures for the body

In 2015, Bíró, Révész & Hidvégi, show us that a prominent role in *healing and rehabilitation* is also assigned for movement in water. It plays a significant role in the preventive treatment of allergic, asthmatic disorders, orthopaedic disorders, injuries, heart and circulatory diseases. Physiological functions are accelerated; the *immune system* more efficiently defends against diseases.

2. Water Properties

Floatability – “The ability of a body to float on the surface of a liquid or at a certain depth” (DEX, 2009); according to Archimedes, a body immersed in a liquid is pushed vertically, from bottom to top, with a force equal to the weight of the displaced volume of liquid; Floatability is useful in training because it allows water to support the body, which is very important during medical recovery, reducing body weight, making it easier for the joints.

A subject's buoyancy can be increased by means of floating devices such as belts and vests. Floatability can also be positive (for bodies with a lower density than water, for example wood, neoprene) and negative (for bodies with a higher density than water, e.g. aluminum, steel).

- Hydrostatic pressure (water pressure): the force with which water presses; the hydrostatic pressure increases with the depth, and applies to the entire surface of the submerged object. It is a very important feature of physical improvement: increased body pressure reduces inflammation and allows the subject to exercise without the risk of new injuries or inflammation of existing injuries.
- Fluids' dynamics (flow): *"fluids' dynamics studies the movement of fluids and their interaction with rigid bodies, taking into account the forces that intervene and the energy transformations produced during the movement. In the dynamics of fluids general principles of general mechanics apply, variation laws and conservation laws"* (Florescu, 2007, p. 47).

In the pool, during training, we can modify the dynamics of fluids in order to change the intensity of the training. When the subject maintains a hydrodynamic form, minimal flow disruptions occur. But if it uses a method that is contrary to the hydrodynamics or if an object such as a float is used, it will stop the flow and increase the water resistance, this indicating the increase of the movement's intensity.

- Depth: By modifying the immersion level of the body in the water, it can increase or decrease the load on the locomotor system, which is very useful in preventing injuries as well as medical recoveries. It is an inverse ratio between the depth of the fluid and the body mass supported by the locomotor apparatus. When we are standing in the pool with water to the

throat, the body carries about 8 % of its weight. If the water level drops to the chest, the body weighs between 28 % and 35 % of its weight, when the water reaches the waist the body will stand up to 47 % – 54 %.

3. The Effects of the Water Over the Body

3.1. How the Body Behaves in the Water

"Swimming can be defined as the art of harmonizing functions of the cardiovascular system and respiratory system with coordinated movements of segments in an atypical environment to the human being, the water, to ensure propulsion of the body and balance on the unbalanced surface" (Vasile, 2007).

The physiological response of an organism to water is different from the situation on land. This directly affects the way the therapist, instructor, teacher or coach prepares the session with the subjects.

Swimming is both a physical and a psychological endurance activity, a cyclic sport, the main beneficiary of the body being the cardiovascular system. Swimming accelerates cardiac contractions and increased heart rate increases both venous pressure and improves blood pressure by lowering systolic pressure and increasing the diastolic pressure at rest. The development of cardiac muscles influences heart activity in general and blood circulation in particular. The respiratory system is also influenced by the hydrostatic pressure developing both the diameter of the chest box, the vital capacity and the inspiratory muscles.

Due to the increased pressure on the chest cavity, the respiratory function decreases, almost 9% of the vital capacity is lost, more precisely the total volume of air exhaled after a maximum inspiration decreases.

When practicing swimming, the muscular force also changes, contributing by the executions without great strains on the development of the muscles. It significantly improves the mobility of the vertical column, while reinforcing the muscles of the back. The entire muscular system is involved in swimming-specific activity, thus contributing to the maintenance and development of vital processes.

The physical development indices increase, thus supporting a harmonious development of the locomotor apparatus.

Being in the water, the rate of breathing increases, but however the maximum and submaximal heart rate is about 8-10 % lower than the heart rate recorded on land.

“The woman’s respiratory system is less vigorous, the fluids of the lungs and tissues are more limited, and the respiratory capacity in women is smaller. Women have a higher costal breath, while men have a lower and abdominal costal breath. The cardiovascular device of the woman is distinctive, both in shape and volume, as well as the functional flow of the heart as peripheral circulation and the blood composition. The heart of the woman is smaller, the contractions are faster and the flow is lower” (Rață, 2015).

By systematically practicing swimming, these metabolic processes become more streamlined and metabolism is taken the strain by increased caloric consumption. Metabolism is also enhanced by increased burns in the tissues, also by accelerating burns the functions of the endocrine glands are stimulated, especially of the thyroid gland.

Adjustment of cortical nerve processes occurs during swimming or hydrotherapy sessions. Favorably influences the psyche through the recreational and at the same time invigorating effect.

3.2. Water as a Means of Recovery

The treatment and recovery of the body through water action is highly

appreciated. It is used in the treatment of paralysis and poliomyelitis, and hydrotherapy is also considered a form of treatment. Thus, programs initiated in the hydrotherapy direction are individualized, having enough variables such as temperature and water properties, duration of program implementation as well as age, gender, affection and level of reactivity of the individual.

Aqua-gym is another way of exercising in water. The water can be up to the chest or to the neck. Pool exercises require the participation of all muscle groups in an attempt to maintain the body’s position and at the same time increase their difficulty (Rodrigues Adami, 2004).

We can mention in these circumstances other options for exercising physical prophylactic exercises in the water, Ai Chi, which is a form of aquatic exercises used for relaxation, physical rehabilitation and fitness. Ai Chi movements can be used to improve the blood circulation of individuals with chronic pain, arthritis, muscle atrophy, lung disease, diabetes, multiple sclerosis or other neurological and orthopedic problems.

Water activity is also beneficial to pregnant women because as it helps them to correct their posture, straighten the shoulders and abdominal muscles, which are very stressed during pregnancy. It relieves pain in the joints as well as the discomfort experienced by pregnant women.

Swimming helps to relieve the affections of the column, therefore the breaststroke swimming style has a beneficial effect on the scoliosis and the back style on the kyphosis.

In the case of people with physical disabilities water exercises are recommended because of the buoyancy of water, so they can perform movements that they cannot do on land.

For example, swimming is recommended in conditions such as rickets – while improving physical deficiencies,

infantile paralysis, joint injuries, and asthmatics – acting on the central nervous system, cardiovascular and respiratory imbalances, having a beneficial effect in the fight against varicose veins – decreases venous pressure.

4. Conclusions

In the context of the above mentioned, due to its beneficial influences on the human body, swimming is considered as a prophylactic means of relaxation and improvement of the general health.

Immediate or lasting changes in all systems, tissues and functions of the human body can be observed after practising swimming. That is why we find it many times as a means of treatment in multiple disorders.

It is a generator of well-being, relieves anxiety and depression. Systematically practicing swimming develops flexibility, strengthens ligaments, prevents accidents, develops almost the entire musculature of the body, and stimulates circulation and psychomotor development.

Due to the aerobic specificity of swimming, it can help maintain optimal cholesterol parameters, and release of endorphins during swimming sessions results in diminished stress levels.

Thus, we can conclude that swimming has multiple functional and therapeutic valences, is considered today a beneficial social activity for all persons who practice it in its various forms.

REFERENCES

- Academia Română, Institutul de Lingvistică “Iorgu Iordan”. (2009). *Dicționarul explicativ al limbii române*, ed. a 2-a, rev. București: Univers Enciclopedic Gold.
- Bíró, M., Révész, L., & Hidvégi, P. (2015). *Swimming History Technique Teaching*. Kelet-Magyarország: EKC Líceum Press, 6-62.
- Florescu, I. (2007). *Mecanica fluidelor, Note de curs pentru uzul studenților*. Bacău: ALMA MATER, 47.
- Kari, G. (2012). *Înot/Curs în tehnologie IFR*. București: Fundația “România de Mâine”.
- Palmer, J. (2010). *Simple Swimming Guide*, available at: <http://www.ebookwholesaler.net/terms.php>, 7.
- Rață, S. (2015). *Modelarea aplicării mijloacelor specifice înotului în refacerea și recuperarea persoanelor de vârstă 31-40 de ani*. Teză de doctorat. Chișinău: Universitatea de Stat de Educație Fizică și Sport a Republicii Moldova, 32-34.
- Rodrigues Adami, M. (2004). *Gymnastique aquatique*. Paris, France: Hachette Pratique, 6-12.
- Vasile, L. (2007). *Înot pentru sănătate*. București: Didactică și Pedagogică.