EFFECTS OF SWIMMING WITHIN DISABLED PERSONS

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(Review)

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Abstract

All around the world, including our country, there are many persons with disabilities. Disability is a stadium of persons organism, developed due to illness, injuries, or birth defects, which causes permanent, partially or total decrease of persons ability for normal life. Water was always natural attraction, and an environment used by persons of all ages for various kinds of recreational and therapy activities. Water environment is usually used both, by healthy and disabled persons, to improve its health and life quality. For many years, swimming and water therapies are recognized as rehabilitation programs for the persons with special needs. Advantages of water environment can be explained by its qualities. Most frequently used method for water therapies is Hall-Wick method. Its effects with persons with special needs reflects in: increase of aerobic fitness, increase of muscle strength, endurance and flexibility increase, improved skills for physical activities (i.e. from wheelchair to swimming pool), communication abilities and relaxation improvement, improved self-control etc.

Key words: *recreational activities, hydro-therapy, rehabilitation, motor flexibility, hydro-static pressure, viscosity of water*

INTRODUCTION

Although there are significant oscillations, it has been estimated that a percentage of disabled persons within general world's population, is around 10%. Knowing the fact that there are more than 6 billiards of inhabitants in the world, we can say rightfully that a figure of 600 million of disabled persons is correct. Therefore, since this high number of disabled persons, a speech on the "the most numerous world's minority" is the speech of the ones (Zovko, 1999). According to an estimation of Monitoring and Evaluation Centre in Serbia, there are around 13, 5% of disabled persons (Zivic, Mitanovski and Savic, 2009).

Disability represents a state of an organism since illness, injury or congenital defect, which has for a consequence a permanent, partial or complete reduction of a man's ability for a normal life (Djuraskovic and Zivkovic, 2009). Disabled persons represent a very heterogeneous population since there are different deformities being localized in different parts of a body and senses. It has been understood under swimming an ability to maintain the body on the water surface and ability to move in the water with suitable movements of arms, legs and body (Madic, Okicic and Aleksandrovic, 2007). Swimming is a favorite sport for most of body disabled persons, especially within those having legs handicapped. Like other forms of physical exercising, it has its characteristics influencing positively onto: motoric, morphological, functional and psychological development of a personality. Swimming can be successfully used not only in rehabilitation, but also like a form of recreational or sport physical activity within disabled persons.

There is a characteristic within swimming of weight loss since the effect of pressure force, which enables easier movement, especially within persons of disabled motoric. Swimming contributes successfully to an intensive reduction of anxiety and depression and improves one's mood. Learning of swimming in a group brings to making friends and friendships. These are just some of health, psychological and social values that make swimming to be one of the most applied physical activities within disabled persons.

THE IMPORTANCE OF WATER ENVIRONMENT WITHIN DISABLED PERSONS

Water has always been a natural attraction and it is an environment being used by people of all ages for recreational activities, and also as a possibility to a therapy application. Rain or having a shower can influence on our feeling of wealth. Water environment is being generally used by healthy persons and population with defects to increase their functions and improve the quality of life (Cole & Becker, 2004, Getz, M. 2006). Physical activity in the water or water therapy can have advantages firstly within persons with health problems, defects, and persons with restricted body movements as it has been defined in the Functioning, Disability and Health International Qualification (WHO, 2001).

The increase of motoric performances is a main concern of therapy interventions for children with motor disability (Getz, M., Hutzler, Y., & Vermeer, A. 2006). Swimming and hydro-therapy can be seen as useful activities for children with neuromotor deformities. The activities and exercises performed in the water environment reduce the influence of great quantities of stress and tension onto the body. They shall secure a possibility for improvement of physiological and psychological achievements. Warm water with a temperature of around 32-33 °C reduces muscle tonus, which in return, allows more efficient movement for children with high muscle tonus (Adams & McCubbin, 1991). For a long time, water therapies and swimming have been recognised as ways of rehabilitation for disabled persons (Becker & Cole, 2004; Ruoti, Morris, & Cole, 1997. po Tirosh, R., Katz-Leurer, M., & Getz, M.D. 2008). Recently, water therapy has been reported as the most often form of treatment within children with cerebral paralyses (Hurvitz, Leonard, Ayyanger, & Nelson, 2003. po Tirosh, R., Katz-Leurer, M., & Getz, M.D. 2008).

The advantages of water environment as therapeutic one can be explained by its numerous characteristics: 1. Archimedes Law helps in performing movements which would be hard to perform on the ground since impossibility to overcome gravity limits, 2. Hydro-static pressure improves breathing and increases a beating heart volume, which in return, gives higher efficiency in keeping of general body condition, 3. Warm water temperatures (32-33°C), are mostly being used in therapeutic purposes, stimulate muscle relaxation, reduce muscle tonus, allow more efficient movement of children with cerebral paralyses and can secure pain reduction, 4. The viscosity of the water itself in relation to the air increases movement resistance which influences positively onto muscle strength within persons.

In treatment of children with cerebral paralyses and similar neuro-motor deformities, water interventions have been considered as one of the most popular types of additional therapy. Like other therapeutic methods, the main aim of the water therapy is to improve everyday activities and increase life functions onto a higher level. Swimming movements can be performed slowly, which reduces water resistance, if one accelerates the movement, thus the movement resistance increases. All stated here gives great possibilities during dosing of these sports, according to swimmers' abilities. Dosed swimming increases the function of cardio-vascular and respiratory system, with the increase of material flow. Gehlsen, Grisby, & Winant (1984) determined that exercising in water leads to improvement of legs' muscles. Numerous health institutions have water structures and have been used by them, several great books have been published under a title of rehabilitation in water, different courses are performed in training of disabled persons in water, like Hallwick, Bad Ragaz Ring Method and Watsu.The most often used in therapeutic purposes on water environment has been Hallwick Method (Bumin, et al., 2003; Cuhna, 1996; Mackinnon, 1974).

Table 1. Ten points of Hallwick's Programme

1.	Mental (Psychological) adjustment	It means a need to overcome fear of water and adjustment of a learner to it.
2.	Independency	The point of the programme to gain higher psychological and physical independence of a learner related to a teacher.
3.	Transversal (cross) rotation	It means performance of movements back and front around a transversal axis and control of the movement.
4.	Sagittal (hip) rotation	It means performance of hip movements around a sagittal axis and control of the movement.
5.	Longitudinal (vertical) rotation	It means performance of movements around a vertical axis and control of the movement.
6.	Combinations of rotations	It means combination of performance of movements around all three axes.
7.	Pressure down	The aim of this point is based on usage of pressure force. The aim is for a learner to learn that water lifts one onto the surface, gaining by application of suitable exercises.
8.	Still balance	The aim of this exercise is to teach a learner to keep one's balance in the water.
9.	Slipping with turbulation	This point of the programme has its aim for a learner to feel a possibility of movement through the water by creating whirlpools.
10.	Propulsion and beginning swimming technique	It is a final point which means ability of a swimmer to swim and move independently.

SWIMMING TRAINING METHOD WITHIN DISABLED PERSONS

One of the applied methods in swimming training within disabled persons is Hallwick Method. The method originates from James McMillan from 1949. (Hallwick Association of Swimming Therapy, 2002), from England. It has been based on the laws of hydro-statics, hydro-dynamics and mechanics of body movement in the water. This method has been adjusted to all ages and different forms of defects. This method means learning in one to one model, without the usage of assistance swimming requisites, so as to secure higher connection between a learner and a teacher. The purpose of the method is to learn to float, i.e. to keep on the water and in that way, gain trust towards water. It is being gained through different types of changes of body positions in the water, floating, slipping and different games in water. When a person gains trust towards water once, i.e. when the one becomes safe in accepting the upstream forces and body floating, then there is a possibility to learn swimming techniques. The programme is based on the following ten points shown in the *Table 1*. Ten points of the programme secure the basis for practical work, since the mutual basis of Hallwick's concept is a simple one and follows a logical structure.

We can see through these ten points a process of *psychological adjustment, balance control and movement* which leads to independency in the water.

Psychological adjustment, this includes that a swimmer is able to respond to different situations in water flexibly, one's environment and tasks. A student needs to gain the ability to respond automatically, independently in different situations in the water.

Balance control, this means to be able to keep or change positions in the water, but in a way controllable by us. In a new situation or environment, control is very difficult for a beginner, and then additional movements shall appear. A swimmer must use firstly to keep on the water, so as to avoid superfluous movements and learn to use all necessary and efficient movements.

Movement is the ability to create a needed movement, to perform them efficiently and skillfully, through psychological and physical control.

SWIMMING EFFECTS WITHIN DISABLED PERSONS

The greatest contribution of sport and physical exercises consist in readaptation and resocialisation of disabled persons. Involvement of sport and physical exercises into a treatment and rehabilitation process of disabled has a multiple psychological effect. By this engagement, a disabled person feels pleasure for being physically engaged, and to be in a group with similar healthy persons. There

are positive changes originating in vanishing of psychological pressure. Disabled sport persons overcome more easily conflict situations happening in a family. Active doing of sport increases self-confidence of a disabled person and faith in possibilities left to the one, noticing they are not so small. Also, the one finds knowledge that he/she is not a useless member of a society and family. Doing of sport and physical exercises for a disabled person represents a treatment in essence, where compensatory mechanisms have been maximally engaged being base for a modern rehabilitation (Djuraskovic, R., Zivkovic, D, 2009). Swimming programmes for disabled persons bring a line of advantages, depending on how many programmes have been applied to and special needs of any learner being involved. Positive effects of swimming within disabled persons are: increase of aerobic fitness, increase of muscular strength, increase of stamina, increase of flexibility, a higher skill in doing activities (e.g. from a wheelchair to a pool), improvement of communication, reduction of superfluous movements and improvement of relaxation, higher self-control.

CONCLUSION

Being in the water and movement in it influence onto disabled persons by a line of positive effects. Water firstly allows these persons to perform movements that are impossible or difficult for them on the ground. Many of them can only move independently in the water. By application of Hallwick Method we allow disabled persons to move independently by learning to swim. The effects of swimming within disabled persons have been reflected in: increase of aerobic fitness, increase of muscular strength, increase of stamina, increase of flexibility, higher skills in doing activities (e.g. from the wheelchair to the pool), improvement of communication, reduction of superfluous movements and increase of relaxation, higher self-control, etc. therefore, it is necessary to organize seminars and give significance to swimming in them, performance of movements in the water and the line of positive effects being manifested within the disabled person.

REFERENCES

Adams, R.C., & McCubbin, J,A. (1991). *Games, sports, and exercise for the physically handicapped (4th ed.).* Philadelphia: Lea i Febiger.

Bumin, G., Uyanik, M., Yilmaz, I., Kayihan, H., & Topcu, M. (2003). Hydrotherapy for Rett syndrome. *Journal of Rehabilitation Medicine.* 35, 44-45.

Cuhna, M. B. (1996). Spinal muscular atrophy type 2 and 3: Evolution of 50 patients with physiotherapy and hydrotherapy in a swimming pool. *Archives of Neuropsychiatric.* 54, 402-406.

Djurasković, R.., & Zivković, D. (2009). *Sport osoba sa posebnim potrebama, sport invalida* [Sports people with special needs, disabled sports. In Serbian.] Niš: Fakultet sporta i fizičkog vaspitanja.

Getz, M., Hutzler, Y., & Vermeer, A. (2006). The Relationship Between Aquatic Independence and Gross Motor Function in Children with Neuro-Motor Impairments. *Adapted Physical Activity Quarterly.* 22-46.

Getz, M., Hutzler, Y., & Vermeer, A. (2006). Effects of aquatic interventions in children with neuromotor impairments: a systematic review of the literature. *Clinical Rehabilitation.* 20, 927-936.

Grčić-Zubčević, N., Markus, D., Sajber, D., & Trstenjak, B. (2005). Računalski program "obuka neplivača" [Computer program "training of non-swimmers".In Croatian.] *In Proceedings of "14. Ljetnja škola kineziologa Republike Hrvatske, Rovinj, 2005,* (pp.173-179). Zagreb: Hrvatski kineziološki savez.

Madić, D., Okičić, T., & Aleksandrović, M. (2007). *Plivanje* [Swimming. In Serbian.] Nis: SIA.

Mackinnon, K. (1997). An evaluation of the benefits of Halliwick swimming on a child with mild spastic diplegia. *Association for Peadiatric chartered Physiotherapy Journal Journal.* 30-39.

Tirosh, R., Katz-Leurer, M., & Getz, M. D. (2008). Halliwick-Based Aquatic Assessments: Reliability and Validity. *International Journal of Aquatic Research and Education*, (2), 224-236.

Zovko, G. (1999). Invalidi i društvo [Disabled people and society. In Serbian.] *Revija za socijalnu politiku*. 6 (2): 105-117.

Zivić, M., Mitanovski, L., & Savić, M. (2009). *Priručnik za zapošljavanje osoba sa invaliditetom* [Manual for employement of persons with disabilities. In Serbian.] Beograd: Centar za monitoring i evaluaciju.

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ЕФЕКТИ НА ПЛИВАЊЕТО КАЈ ИНВАЛИДИЗИРАНИТЕ ЛИЦА

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(Прегледен труд)

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Апстракт

Во светот и кај нас има голем број на лица со инвалидитет. Тој претставува состојба на организмот која настанала поради болест, повреди или вродени мани. Инвалидитетот доведува до трајно, делумно или целосно смалување на човековата способност за нормален живот. Водата од секогаш била природна атракција и таа е средина која ја користат луѓето од сите возрасти за рекреативни активности, како и средство за терапија. Воденатa средина вообичаено ја користат здравите лица и популацијата со оштетувања, со цел за зголемување на функциите и подобрување на квалитетот на животот. Подолго време воденатa терапија и пливањето е познати како начин на рехабилитација за лицата со посебни потреби. Предноста на воденото окружување како терапијска средина може да се објасни со многу постапки. Најчеста метода која се користи во терапијски цели во воденатa средина е Hallwick-метадата. Ефектите на пливањето кај лицата со посебни потреби се состојат во: зголемување на аеробниот фитнес, на мускулната снага, на издржливоста, на флексибилноста, поголема вештина во изведувањето на активностите (на пример, од количката до базенот), подобрување на комуникациите, смалување на непотребните движења и подобрување на релаксациите, поголема контрола и слично.

Клучни зборови: *рекреативни активности, хидротерапија, рехабилитација, моторна флексибилност, хидростатички притисок, вискозност на водата*