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EFFICIENCY OF THE TRAINING PROGRAMME FOR NON-SWIMMERS ADAPTED FOR WOMEN WITH A PRONOUNCED FEAR OF BEING IN WATER

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Abstract
The aim of this research was to analyze the efficiency of individual training programme for adult women non-swimmers, among whom is evident a pronounced fear of being in water (swimming). The sample consisted of 20 persons, 26 to 59 years of age. In the study the variables for the evaluation of adaptation parameters needed for being in water were used as well as for swimming performance of subjects. Training programme for non-swimmers was performed individually. The activities were carried out in 20 periods each lasting 60 minutes, in a slightly incline swimming pool adapted for training of non-swimmers. Results of paired-samples t-test have shown a high statistical significance of all variables. Under the influence of the programme there have been significant changes in the values of the variables: swim across distance in meters (PRMET $p < .001$); swimming knowledge assessment (OPPL $p < .001$); assessment of swimming technique (OPT $p < .001$). Based on the results obtained in this study it can be concluded that the applied programme successfully overcame the fear factor among all examinees, which was essential for the continuation of activities. After psychological adjustment, a more advanced movement activities were efficiently implemented as well as swimming skills and elements for a safe and enjoyable time spend in the water.

Key words: **education of adults, transformational process, psychological adjustment, swimming**

Introduction

Drowning is one of the leading causes of injury resulting in death worldwide. Therefore, the need for a preventive strategy of education and overcoming the fear of being in water arises for teaching non-swimmers of all ages and improving their skills of moving in water through some form of swimming (Brenner el al., 2003). Swimming is an activity of movement of living things in the water that includes maintenance on the water surface and movement in the desired direction. In earlier studies (Stallman et al., 2008) it was noted that the training of non-swimmers represented only one of the preventive measures that were aimed to prevent drowning. Fear is probably one of the most deeply rooted emotions in the human psyche (Ziara, 2005). When we talk about the psychological concept of concern (Rychta, 1990), we can distinguish two types of anxiety: the care of a certain phenomenon, physical or imaginary (closer to the concept of fear) and abstract anxiety (closer to the concept of trepidation). The presence of fear warns the body about the dangers ahead, inhibiting harmful acts and starting actions aimed at rescuing itself from a given situation (Freud, 2000). Regarding fears of being in water, it should be noted that in children it's an integral part of the generic cluster or fear of the unknown or danger, while in adults they become independent generic fears (Graham et al., 1997). For individuals where it is evident that they have a pronounced fear of being in water, it is necessary to ensure adequate environment and to prepare them for the training of basic movement elements in order to secure a safe time spend in that environment as well as a swimming programme individually adapted to each person (Grosse, 2010; Stillwell, 2011). A significant number of adults fall into the category of non-swimmers. Many of them, aware of the above stated facts, come to the knowledge and desire that they should try to overcome the fear of being in water and to learn basic elements of swimming. Having that in mind, it is necessary to make every effort in order to reduce the percentage of non-swimmers of all ages (Gošnik et al., 2011). Interesting data from previously conducted research in the Republic of Croatia (Grčić-Zubčević, 2010) show that women have a greater interest for such edu-

cation. According to the number of registered adults who want to learn how to swim, two thirds are females. Studies have also shown that the greatest interest for learning how to swim in adults of both sexes is between the ages of 25-29 years, which also classifies as adulthood (Berk, 2008). In accordance to the aforementioned, the aim of this research was to analyze the efficiency of individual training programme for adult women non-swimmers, with a pronounced fear of being in water (swimming).

Methods

The sample of participants

The research was conducted on a sample of 20 female participants, 26-59 years of age. Before conducting the research all participants signed a protocol/form where they indicated that they are non-swimmers, have felt an intensive fear of swimming in water for many years and that they have voluntarily entered the training programme for non-swimmers.

The sample of variables

The study used variables (Table 1) to assess the swimming performance of the participants (swim across distance in meters, swimming knowledge assessment and assessment of one of the swimming techniques at the option of the participants). Testing and evaluation was conducted by an expert team of evaluators/judges, using an expert assessment method according to the pre-defined criteria (Kazazović et al., 2007). Swimming knowledge assessment was defined on the basis of the evaluation test results of adaptation parameters required for spending time in water (Table 2) and swim across distance in meters. Evaluations are defined on a scale from 1 to 5 (Table 3). For the evaluation of the quality of swimming technique performance (Table 4) the participants had a free choice of selecting one of the swimming techniques which were rated from 1 to 5 (Rađo, 1997).

Table 1. Variables for swimming knowledge assessment

Variable	Assessment	Records
PRMET	Freestyle swimming	Swim across distance in meters
OPPL	Swimming knowledge assessment	Expert assessment of swimming elements (from 1 to 5)
OPT	Assessment of swimming technique	Expert assessment of swimming elements (from 1 to 5)

Table 2. Evaluation tests of adaptation parameters for spending time in water

Variable	Test	Observation of task fulfilment
GGL	Head dive	Can/Can't – dive the head under the water > 5 seconds with deep exhalation
ROP	Diving of an object	Can/Can't – dive and pick up a light object from the depth of 140 cm
SNP	Feet jump into shallow water	Can/Can't – jump feet first into 140 cm of shallow water
SND	Feet jump into deep water	Can/Can't – jump feet first into 220 cm of deep water
PNS	Floating on a belly	Can/Can't – float on a belly > 5 seconds
PNL	Back floating	Can/Can't – back float > 5 seconds

Table 3. Model evaluation for the swimming knowledge assessment variable (Kazazović et al., 2007)

Evaluation	Movement assessment
EVALUATION 5 - Swimmer	Jumps on feet into deep water on its own, swims the distance of minimum 50 meters-two styles and comes out from the pool on its own.
EVALUATION 4 – Swimmer a beginner	Jumps on feet into deep water on its own, swims using freestyle technique the distance of minimum 25 meters and comes out from the pool on its own.
EVALUATION 3 – Semi-swimmer	Jumps on feet on its own, swims using freestyle technique the distance between 10-24 meters and comes out from the pool on its own or with the help from an instructor.
EVALUATION 2 - Floater	It can, for a short period of time, keep afloat on chest and swim using freestyle technique up to 10 meters and come out from the pool on its own or with the help from an instructor.
EVALUATION 1 – Non-swimmer	Does not have any knowledge about swimming.

Table 4. Model evaluation for the quality of swimming technique performance (Rađo, 1997)

Evaluation	Movement assessment
EVALUATION 5	Technique performance with the optimal angle of attack (depending on the swimming technique), with the optimal range of motion of the body (depending on the swimming technique), around longitudinal and transverse axis, the correct entry of arms into the water and the realization of propulsive and retro propulsive part of the stroke, proper legs work, excellent coordination of arms, legs and breathing.
EVALUATION 4	Technique performance with the optimal angle of attack (depending on the swimming technique), with the optimal range of motion of the body (depending on the swimming technique), around longitudinal and transverse axis, the correct entry of arms into the water, the occurrence of defects during realization of the propulsive and retro propulsive part of the stroke, proper legs work, good coordination of arms, legs and breathing.
EVALUATION 3	Good technique performance, existence of small defects of aforementioned elements, but the whole structure of the movement is not disturbed; there is a satisfactory coordination of arms, legs and breathing.
EVALUATION 2	Technique performance is disturbed; there is existence of defects of all aforementioned elements, bad coordination of arms, legs and breathing.
EVALUATION 1	Poorly performed technique, there are significant defects of all aforementioned elements. The structure of the movement is significantly disturbed, very bad coordination of arms, legs and breathing.

Three evaluators (judges) conducted the testing and evaluation. The evaluators were highly educated with evident practical experience in swimming training programs. They had to meet certain criteria (to have a degree of graduate teachers of sport and physical education; to have at least three years of experience in the implementation of the training programmes for non-swimmers and learning of swimming techniques). Before starting the test, the evaluators were introduced to the procedures, process and assessment criteria. The procedures contained harmonized criteria with an emphasis on the body position, work of arms and legs, proper breathing and coordination. During evaluation, the examinees performed each test only once.

Training programme

Swimming training programme was adapted and implemented individually, during morning hours, under the expert guidance of graduates with a kinesiology degree, experts for training of non-swimmers. Activities were carried out in 20 periods each lasting 60 minutes, according to a defined curriculum (Table 5), in a slightly incline swimming pool adapted for training of non-swimmers (average water temperature was 29,3°C). Training dynamics was conditioned by a working capacity of each examinee.

Table 5. Individual training programme of teaching non-swimmers

Plan and Programme/ Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Sets of warm up exercises	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Aqua gymnastics						*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Adaptation in water	*	*	*	*	*															
Breathing exercises	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*					
Diving-Seeing in water			*	*	*	*	*													
Floating on water exercises			*	*	*	*	*	*												
Sliding and moving in the water					*	*	*	*	*	*										
Legs workout exercises		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Arms workout exercises						*	*	*	*	*	*	*	*							
Arms-Legs working combination							*	*	*	*	*	*	*	*	*	*	*	*	*	*
Combination of movement crawl-back								*	*	*	*	*	*	*	*	*	*	*	*	*
Combination of movement breaststroke-back									*	*	*	*	*	*	*	*	*	*	*	*
Swimming its own style								*	*	*	*	*	*	*	*	*	*	*	*	*
Security swimming exercises																*	*	*	*	*
Jumping on feet																*	*	*	*	*
Jumping on the head																*	*	*	*	*

Methods of data processing

Data on test subjects were obtained by measuring the same variables at two time points, which is before and after programme realization. Assessment analysis of basic adaptation parameters for being in water is shown by percentage statistics. For the results analysis of initial and final testing variables for swimming knowledge assessment a paired-samples t-test was used (Field, 2013) on the level of statistical significance of 0,05% . In order to determine the effect size, an Eta-squared was used (Cohen, 1988).

Results

After the initial measurement it was evident that all participants were non-swimmers, reaching the same score for swimming knowledge and the quality of swimming technique (1), so the evaluators (judges) correlation of these assessments was not calculated. Concordance analysis between evaluators was conducted for the variable of quality of swimming technique performance in the final test (OPTF). Based on the results from the Tables 6 and 7, it can be concluded that analyzed tests of expert assessment of swimming knowledge and quality of swimming technique performance have quality in objectivity (intercorrelations between evaluators are high as well as the reliability coefficient).

Table 6. Concordance analysis between evaluators for giving evaluation during expert assessment

Variable	Evaluator/Judge	AS±SD	CA
OPTF	Judge 1	2.90±1.07	.987
	Judge 2	3.05.±1.14	
	Judge 3	3.00.±1.12	

Table 7. Intercorrelation of evaluators/judges

OPTF	Judge 1	Judge 2	Judge 3
Judge 1	1.000		
Judge 2	.948	1.000	
Judge 3	.962	.981	1.000

On the basis of results of adaptive parameters of spending time in the water (Table 8), as a result of the evident fear of spending time in water, the examinees in the initial testing showed very low level of psychological adjustment necessary for the implementation of planned activities. Even those participants, who on the final measuring managed to do a very small part of the tasks for the assessment of adaptive parameters, implemented the activities with the assistance of instructors. Results of the same parameters on the final measuring indicate maximum work efficiency, and a high level of their psychological adjustment for a safe and enjoyable time spend in water, which in fact was a fundamental precondition for a successfully implementation of training of non-swimmers.

Table 8. Percentage analysis of adaptive parameters for spending time in the water before and after programme implementation

	Initial		Final	
	N	%	N	%
GGL - Head dive	2	10	20	100
ROP - Diving of an object	1	5	20	100
SNP - Feet jump into shallow water - 140 cm	2	10	20	100
SND - Feet jump into deep water - 220 cm	0	0	20	100
PNS - Floating on a belly > 5 seconds	0	0	20	100
PNL - Back floating > 5 seconds	0	0	20	100

Results of descriptive statistics (Table 9) show that the participants managed, on the final measuring, to swim across a significant distance with a mean value around 29 meters. The average rating for the knowledge of swimming (OPPLF) on the final evaluation was 3.9 which put them in a category between semi-swimmer and swimmer a beginner. During final evaluation, the mean score for the quality of swimming technique performance of their choice was 3.0.

Table 9. Descriptive statistics of applied variables in the initial and final measurements

	Mean	N	Std. Dev.	Std. Error Mean
PRMET Initial	3.25	20	1.74	.38984
PRMET Final	29.15	20	14.91	3.33583
OPPL Initial	1.00	20	.00	.00000
OPPL Final	3.90	20	.96	.21643
OPT Initial	1.00	20	.00	.00000
OPT Final	3.00	20	1.12	.25131

Based on the arithmetic mean of the results of swimming variables at the beginning and the end of the program and on the basis of significance of occurring changes tested by a paired-samples t-test (Table 10), it is clear that the programme has made significant partial effects. Also, the value of Eta-squared for all three variables shows that the effect of the implemented programme is large. Results of paired-samples t-test (Table 10) show a high statistical significance of all the variables. Under the influence of the swimming training programme there have been significant changes in the values of the variables: swim across distance in meters (PRMET $p < .001$); swimming knowledge assessment (OPPL $p < .001$); assessment of swimming technique (OPT $p < .001$).

Table 10. Results of paired-samples t-test

	Mean	Std. Dev.	t	df	Sig. (2-tailed)	Eta-squared
PRMETI - PRMETIF	-25.90	13.52	-8.56	19	.000	0.79
OPPLI - OPPLF	-2.90	.96	-13.39	19	.000	0.90
OPTI - OPTF	-2.00	1.12	-7.95	19	.000	0.77

Discussion

Results of previous studies have shown that the process of psychological adjustment in the training of non-swimmers is a very important factor that instructors often neglect (Leite et al., 2007). However, on the basis of a clearly defined plan and programme under which the survey was conducted (various exercises for the proper breathing technique, floating, diving and sliding on water), it is evident that the optimal quality of the psychological adjustment of all examinees, especially in the beginning of programme activities, was taking care of. Also, these exercises have been repeated periodically until the end of the planned programme activities. In kinesiology education, that among other things includes the improvement and transformation of the level of motor and theoretical awareness and motor achievements, individualization in working with participants in the most efficient way. The results obtained confirm the conclusions of authors of earlier studies in which the efficiency of the individualization of work is emphasized, giving priority to individual approach in kinesiology education whenever possible (Findak, 2003; Keškić, 2012). The movements in the water were gradually adopted, resulting in easier composition of fine combinations of posture and movement. During the implementation of the swimming training programme, the test subjects went through internal changes that determined the ability of each individual for the correct movement performance. This confirms the findings of earlier studies (Rađo, 2000; Schmidt et al., 2004; Torlaković et al., 2012), that the level of adoption of the quality of movement and each motor learning is improved by practise and the system of individual parts of the movement significantly changes and improves over time. Although it was an individual approach to education, working with adults can very often be challenging for swimming instructors because it contains many problems such as the age range of participants, psychological maladjustment to aquatic medium, levels of anxiety, health problems and reduced motor and functional abilities, which was already stated in the conclusions of previous studies with similar sample (Grčić-Zubčević, 2010). It should be noted that after a successfully completed programme the participants should continue to work on improving their swimming performances, because if a swimmer fails to assess its skills and does not take into account the conditions on the water (the sea, pool, lake, river, etc.) there is a constant danger of drowning, so precautions are necessary (Budimir et al., 2010).

Conclusion

Although the participants had, before the start of the program, a pronounced fear of being in water and swimming, which was determined by the survey conducted before the start of the research, it can be concluded that after completion of the programme they have successfully adapted to being in water and moving through water. In fact, it was crucial for the dynamics and continuation of educational activities of the basic elements of swimming. After adaptation to the water, a more advanced movement activities were implemented efficiently for a safe and enjoyable time spend in the water. Circumstantially, the participants in this research did not have a chance during growing up and regular schooling years to access education for non-swimmers in order to overcome the fear of being in the water during their childhood.

Therefore, it should be emphasized that the introduction of teaching how to swim as part of the regular educational process of physical education would be very useful for future generations.

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