THE INFLUENCE UPON FUNCTIONAL CAPACITY OF LUDIC RECREATIONAL ACTIVITIES CARRIED OUT IN VARIOUS ENVIRONMENTS

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Abstract
Physical activity practiced in various environments, through the influences that they can bring on the effort, in correlation with the technological innovation of materials, can generate positive inputs on the body, with connotations on the functional capacity as well.
The present research aims to observe the influence level of functional capacity, as a result of typical activities practice, carried out on the ground or in the water, in covered areas, with the use of carefully selected action means, to which innovative materials are added and which require a different effort depending on their characteristics. The research enclosed two tests, the initial and the final test. The 2K walk test was applied with target on the following parameters: VO2 max, FC max, physical condition index (PI) and body mass index (BMI).
Keywords: *functional capacity, aqua-gym, aqua-pullpush-gym, physical condition index, VO2 max, FC max.*

INTRODUCTION

Ludic recreational activities practiced in various environments – in the water and on the ground – require a biological adaptation-as the body reacts to the physical and psychical stimuli, consisting in modifications encountered within the organs and the important functions of the body.
"The potentials of water environment represent an advantage for physical activity practice and an essential contribution to health and spending the free time (pleasure), derived from its specificity, on functional and esthetic level"[9]. Ludic recreational activities carried out in the water are mainly focused on the physical development improvement, on motric and functional capacity, though not exclusively.
Successive changes undertaken currently on physical condition have in view to progressively introduce sport in our life, by encouraging the population to practice physical activities in various environments, while the activity diversity focuses on the training methods which use technical innovations regarding sportive equipment that were transferred to guided activities[19].
The water environment has specific properties with positive influence on movement effects, facilitating the practice possibility of a variety of exercises with complexity and amplitude, no matter the age, sex, physical training.
By comparing the cardiac frequency at rest for more groups, registered on the ground and in the water , it was noticed that when the body is partially immersed in water, this decreased with 1.9 bpm in the case of young women, with 4.7bpm in the case of middle-aged women and with 1.1bpm for professional female divers [21].
Benelli and colab [4] noticed that the decrease of value for the average cardiac frequency in confined waters as compared to the same exercises executed on the ground is the following: 7.5 bmp on the ground and 4.8bpm in deep water.
The oxygen intake and effort index are lower when the body is immersed up to the chest as compared to the body immersion up to the hip [2]. While assessing the vital capacity [2], it was observed that VO2 values are higher in confined waters as opposed to pools with depth over 1.80m. After studying for 12 weeks the effects of water exercises for adult persons, especially those of aqua-gym programs executed twice a week for 45 minutes, Di Masi [6] observed an increase of VO2 max volume with 15%.
Aqua-gym represents one of the modern tendencies of physical exercise practice through the combination of various simple and complex action systems, adapted to the positive influences of the water environment, an ideal blend of aerobics exercises, fitness, stretching and hydro massage. "Aqua-gym represents a complementary unit within water activities, with a rich and diverse content of resources" [13]
Aqua gym has the following "general objectives [18]: the improvement of cardiac-respiratory capacity, of muscular strength and resistance, the improvement of coordinative qualities, the development of general motric capacity, while the

specific objectives are: to re-educate the respiratory function, posture education, to improve and support the neural-psychic relaxation".

Aqua-gym and aqua-pullpush-gym represent important parts of water fitness with focus on multiple formative and sanogenetic aspects, by combining the positive effects of exercises executed in the water and adapted to musical rhythms.

Aqua pull-push gym represents an innovative ludic recreational activity of water gymnastics, consisting in a set of body segments movements, by using the pull-push paddle, with the view to improve the health and physical condition as well as to increase muscular toning [3]. This method of water gymnastics is addressed to all persons over 18 years of age, no matter the sex, weight or physical condition.

The differences between the two activities consist in the used materials, the complexity of action means and also the structure of the class. Therefore, aqua gym has a 4 unit structure: warm up, aerobe unit, localized unit and effort recovery, while aqua-pullpush-gym consists in three parts: warm up, the fundamental part and the recovery. The aerobe unit of aqua gym is made up of exercises specific to aerobic gymnastics, while the localized unit implies the usage of varied materials in order to intensify the effort. Aqua-pullpush-gym uses during the entire fundamental part the pullpush paddles, which require efforts and a superior motric and functional mobilization, due to design and large contact area, being able to involve all overweight body segments.

HYPOTHESIS

To set the hypothesis it was started from the assumption that water based ludic recreational activities practiced during physical education classes by female students from non-profile faculties, will determine the improvement of their motric and functional capacity.

MATERIALS AND METHODS

Participants

The control study sample consists of 47 first year female students from the Transilvania University of Brasov, aged 19-24, from the specialties: Medicine, Sociology and Letters; during physical education classes held in the gym they practiced the following activities: ludic recreational activities, applied exercises, freestyle exercises for the general physical development and exercises with portable objects.

The research enclosed an initial test at the beginning of the first semester, during the first weeks of October 2011, after which the suggested programs were executed throughout the entire school year, followed by a final test at the end of May 2012.

Materials

The objects used during recreational water activities offer an increased productivity to the exercises, due to the floatability factor becoming resistant when an object immerses into water and to the viscosity added to the environment forces [12], [6].

Some studies discovered that trainings with progressive over heaviness based on certain objects usage lead to better results both on the ground and in water – many times, significant differences being registered between them [5]. Aqua-gym uses material like: rubber dumbbells, palmers, gussets, etc. some used for support, others for effort increase, as part of the determined length program.

Aqua-pullpush-gym uses exclusively innovative materials called pull-push paddles, which are characterized by a hydrodynamic shape like a flower, with five "petals" of 37cm in diameter, on the center having an ergonomic handle to hold, slightly rough to prevent slipping. These can also be fixed on the soles in order to execute exercises for the inferior members, having also an accessory called fixopié, looking like sandals, provided with two clips disposed on complementary directions in order to facilitate fixing with a twisting action.

Due to its wide contact surface with the water and also to the small free space between the petals, the paddle can take during its energetic pull actions, a hydrodynamic shape like a jelly fish, this representing the position with the most stable balance.

Methods

The applied methods were: the bibliographic study, the observation, the study, tests, mathematical and statistical study and graphic representation. The mathematical data was processed with the help of SPSS 20, calculating the Independent Student Test.

For the physiological evaluation the 2km walk test was applied which shows: the fitness index (physical condition), VO2max, FC max, BMI having a more significant applicability in the scientific research.

"UKK test renders a physical condition index and aerobe resistance and it is applied to adult subjects, physically capable, with ages between 18 and 65 years old" and "it is not valid for subjects executing regular training based on aerobe effort, this being valid for normal or overweight people"[15].

Description: on the treadmill and consists of a 2 km walk, on a horizontal surface, the treadmill will have the tilt index "0". It starts with a slight warm up followed by a 200 m regular cadence, until reaching a reasonable rhythm. It measures the

registered time and records the cardiac frequency at the end of the test.

Fitness index (FI) – Calculation technique: for the fitness index calculation we take into account four parameters: time made for completing the route, heart rate, BMI (body mass index), age of the subject. The formula for fitness index (FI) is the following [15]:

Fitness index = 304 + 0'4 x E - [0'1417 x Ti + 0'32 x FC + 1'1 x (W / T2)]

E - age in years

Ti - the time for completing the 2 Km in seconds

FC-cardiac frequency

W – the subject's weight in kg

T2 - height in meters

Interpretation of results: after calculating the physical condition index, related to age, sex, weight and height, the maximum oxygen uptake capacity can be estimated reliably, expressed with the help of a fitness index, which is divided into 5 groups of assessment. Scores awarded by UKK Institute and taken by G. Dumitru (1997, p. 27) are: below 70 a FI highly below average; between 70-89 somewhat lower than average; between 90 to 110 average; between 110 to 130 slightly above average; over 130 high above average.

Body mass index*:* data on body weight and body height were used to calculate BMI (kg/m2) [14], [12]

BMI *= weight (kg) / height² (cm)*

Interpretation of BMI values: below 19 abnormal, 19- 25 normal weight*;* 26-29 pre obese; 30-35 class I of obesity.

The maximum volume of oxygen: "VO2max was estimated using specific equations, the values included age, body mass index (BMI), the time achieved during the 2 km walk test (min) and heart rate at the end of the 2 km walk test. In order to calculate VO2max (ml × min × kg-¹ - ¹) for women one uses the equation:

VO2max = 116.2 - 2.98 xt - 0.11 x HR - age 0.14x - 0.39 x BMI"

"VO2max test can be estimated with a 2 km walk test: on foot or on the treadmill. This test proved to be a feasible and accurate method for determining VO2max in the case of healthy subjects aged 20-65 [17], [12]

Table 1 the maximum aerobic capacity $VO_{2\,max}$ (ml / min / kg) – women

Age	Decreased	Insufficient	Average	Good	Excellent
20 – 29	< 24	24 – 30	31 - 37	38 - 48	> 49

Maximum heart rate - for women, is calculated as: ***Fc max*** *= 205 - (1/2 x Age)*

DISCUSSIONS AND RESULTS

Subsequent to the study, the cardiac capacity represented by FC max registered drops of arithmetical mean for all study samples. During the initial test, the control group achieved an average value of 195,06±0,37 while at the final test the value was 194,91±0,31 with a difference of - 0.15 b/min (Fig.1). The experimental group which practiced aqua-gym registered an average difference between the two tests of 0.28, while the experimental aqua-pullpush-gym group achieved an average decrease of 0.17bpm. Given that this functional capacity parameter is directly dependent on the age of the subjects during the experiment, we consider the results significant, confirmed and with the correlation index p<05 (Table 2, 3).

Table 2 data summary of the control group as compared to the experimental group aqua-gim

Trials	Test	Control group (n=47) $\bar{x} \pm m$	Experimental group (n=24) $\bar{x} \pm m$	t	p
FC max	TI	195,06±0,37	195,38±0,42	3,05	.002
	TF	194,91±0,31	195,10±0,44	1,86	.070
IMC	TI	21,01±1,28	21,28±1,98	0,61	.485
	TF	20,68±0,66	20,93±1,71	0,68	.386
FITNESS – PI	TI	88,89±7,18	88,16±12,52	0,26	.756
	TF	93,78±4,58	98,18±5,56	3,33	.002*
VO2 max	TI	35,39±2,54	35,31±4,31	0,08	.921
	TF	37,02±1,57	38,67±1,81	3,78	.000*

*p<.05

Table 3 data summary of the control group as compared to the experimental group - aqua-pullpush-gym

Trials	Test	Control group (n=47) $\bar{x} \pm m$	Experimental group (n=24) $\bar{x} \pm m$	t	p
FC max	TI	195,06±0,37	195,25±0,41	1,84	.072
	TF	194,91±0,31	195,08±0,38	1,86	.070
IMC	TI	21,01±1,28	20,77±1,10	0,80	.447

	TF	20,68±0,66	20,28±0,51	2,58	.012
FITNESS- PI	TI	88,89±7,18	89,04±6,38	0,09	.928
	TF	93,78±4,58	107,02±3,77	12,96	.000*
VO2 max	TI	35,39±2,54	35,55±2,29	0,27	.794
	TF	37,02±1,57	41,76±1,29	13,51	.000*

*p<.05

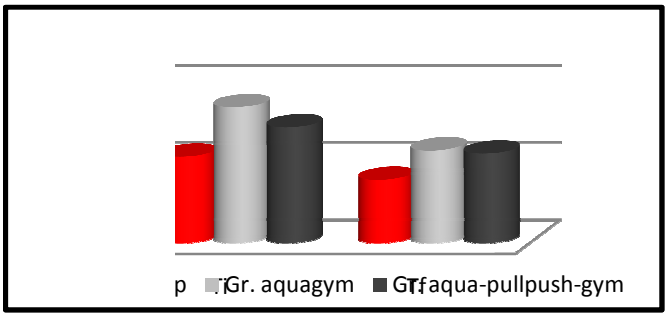

Fig. 1Graphic representation of FC max Averages

After calculating the physical condition index (IF) depending on age, sex, weight and height, this representing the body's maximum capacity level of oxygen uptake, all study samples presented increased values of the arithmetical mean between the two tests. The control group registered a difference of 4.89 units which implied an upgrade to a superior level, consequently the female subjects that were found at the initial test under the category "slightly above average" with a score of 88,89±7,18, advanced at the final test to "average", with a score of 93,78±4,58 (Fig. 2).

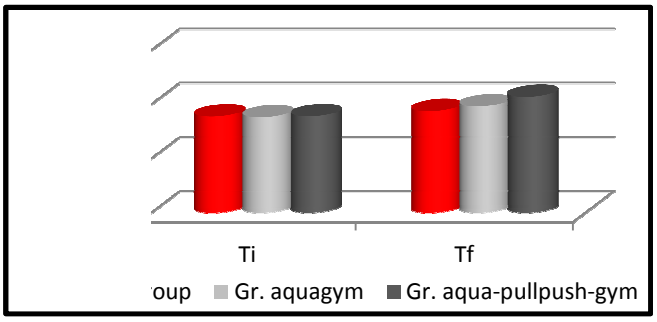

Fig. 2 Graphic representation of the Fitness Index averages

The experimental groups also registered progress on IF level, advancing from "slightly above average" to "average", but the differences of the arithmetical means are more relevant as follows: aqua-gym group achieved 10.02 units, while aqua-pullpush-gym reached 17.98 units.

The difference between the two study samples is accurate and is due to the selected methods and used materials, which require an increased effort from the entire body during aqua-pullpush-gym activity, as compared to the ones used in aqua-gym. A significant role is considered to be held by the properties of water environment, such as thickness opposing resistance in executing the moves and being conditioned by the contact surface.

After the research the experimental groups that executed programs specific to ludic recreational activities registered a decreased value of BMI averages as follows: aqua-gym group 0.35 units, aqua-pullpush-gym 0.49 units and the control group 0.33units. As this index represents the relation between weight and height, also taking into consideration the subjects' age of 19 to 23 years old and an average weight of 57 kg without noticeable variations, we consider that the achieved BMI difference is relevant, being enclosed to normal weight category (Fig.3).

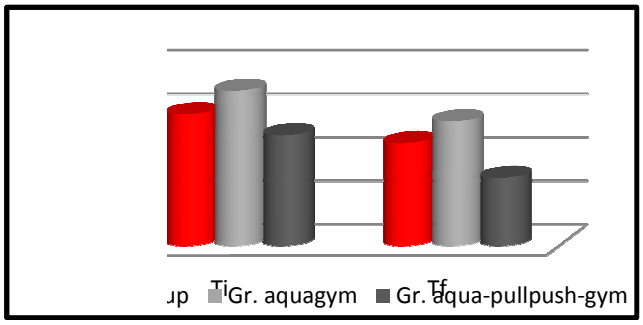

Fig. 3 Graphic representation of BMI averages

VO2max registered a significant progress for all study samples.

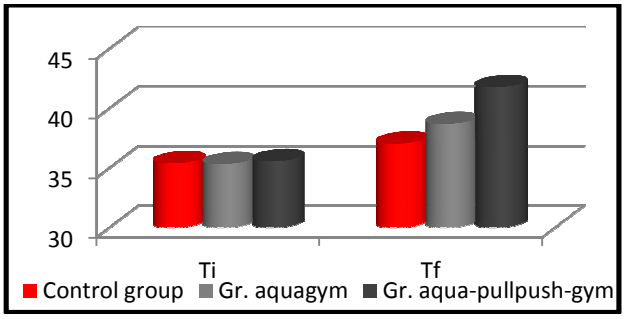

Fig. 4 Graphic representation of VO2max averages

The control group registered at the initial test an average value of 35, 39±2, 54 and for the final test 37, 02±1, 57, with an improved difference of 1.63 mL/Kg/min (Fig.4). The experimental aqua-gym group achieved a progress of 3.36mL/kg/min, while the aqua-pullpush-gym group registered the most noticeable increase of 6.21 mL/kg/min.

CONCLUSIONS

The main conclusion after the research is that the hypothesis is confirmed, namely, the practice of water based ludic recreational activities during physical education classes, by female students from non-profile faculties, generates improvement on their functional and motric capacity.

The usage of modern designed materials during ludic recreational activities, which require sustained handling efforts, adaptable to both inferior and superior members, contributes in an efficient and appropriate manner to the increase of vital capacity parameters.

The selection of the most efficient means along with weighty involvement of all body segments determines effort capacity growths, demonstrated through IF, as well as the development of morpho-functional and motric capacities.

The water environment brings a positive influence on motric and functional indices as a result of ludic recreational programs, reaching a superior level as compared to ludic recreational activities executed on the ground, along with the applied exercises, freestyle exercises for the general physical development or the ones with portable objects.

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STUDY ON THE DEVELOPMENT MODEL OF HIGH PERFORMANCE JUDO COMPETITION

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Abstract
Study on the development of the competitive performance in judo, demonstrating the need to restructure the content of education and training. Coaches and Methodists were recorded and analyzed judo competitions in order to achieve the development of technical projects in national and international championships. Remodelling, training, specific training procedures allows coaches and athletes, good planning and preparation. Determine the means and methods of integrating competitive; please ensure effective training to improve outcomes athletes. The paper presents data on the actions undertaken high-yield high-level competitions. The paper stresses the need for athletes and coaches to adapt to the requirements and implications of the battle.
Keywords*: sports, high performance, competition, training, judo.*

INTRODUCTION

The evolution and dynamics of sport science experts in the field force, to finding new solutions to optimize athletic training in judo competition in accordance with specific requirements. Experts field (coaches, athletes, researchers), demonstrates the need to address increased attention determinants of success in judo. The data obtained by us during