

# **Motor Fitness of Young Women Participating in Aquaerobic**

by  
*Jerzy Eider<sup>1</sup>*

*Aquaerobic is one of the newest forms of modern gymnastics. It consists of different types of exercises performed in the water at a fast pace with music. The aim of the work was to determine a level of motor fitness of 18-19 years old girls participating in aquaerobic (n=49). The results were compared to control group (n=51). Experiment lasted 2-months. Motor fitness was evaluated the using ICSPF Test. The results confirmed that exercises in water had increased the level of motor abilities of girls regularly participating in aquaerobic, especially based on anaerobic power (MAP).*

**Keywords:** woman sport, aquaerobic

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<sup>1</sup> Assoc. Prof., dr hab. University of Szczecin, Al. Piastów 40b, 70-065 Szczecin, Poland

## **Introduction**

The evolution of science and technique during last decade and the change of lifestyle caused by this development determined a few factors influencing movement activity and mental health of contemporary humans. One of the forms of active lifestyle includes participation in "fitness clubs". Different forms of activities proposed by these clubs allow to improve or at least maintain at similar level of motor fitness by people of different age.

Aerobics, callanetics, stretching, step reebok, slide reebok are treated as different forms of modern gymnastics which allow, after systematic training cause solid and successful changes in organisms of participants. One of the newly developed forms of aerobics (Eider 1994a, 1998) includes aquaaerobic. It one of the newest forms of modern gymnastics, which is performed in water (with devices) according to music and at different depths. Existing literature, rarely relates to aquaaerobic (Eider 2001, Olex 2001). They do not research, however, the area motor fitness and changes caused by this form of gymnastic on human body.

The main aim of this work was to evaluated the influence of exercises in water on motor fitness of girls participating in the experiment.

## **Material and methods**

The experiment was conducted on 100 girls aged 18-19. The experimental group consisted of 49 girls participating twice per week (45 minutes) over a 2 month period in aqua aerobics. The control group consisted of 51 randomly chosen girls. The amount of movement activity was equal to two hours of standard physical education classes per week. In order to determine the level of motor fitness the ICSPFT test battery was used. The evaluation was conducted twice in a 2 month period (before and after experiment).

The water exercises were performed at the water depth of 120 cm and water temperature of 26-28°C. The exercises were slow and adjusted to subjects' age and skills. There were no exercises with complete head emersion and whole lesson was lead by the instructor. Lessons were divided into three parts. First, (8-10 min.) was focused on acquaintance to water environment and warm-up. It included slow developing exercises engaging all muscle groups. Second part of lesson (25-30 min.) had aerobic character with developing elements in different positions. In all exercises the elements of running in water were present. The pace of exercises in this part was relatively high, however water resistance was

taken into account. Third part of lesson (5-8 min.) was focused on relaxation and correction exercises to slow music.

## **Results**

The improvement of motor fitness test results for the experimental group are presented in table 1. In 50 m run, standing broad jump, 800 m run and bent arm hang on the bar the increase in results was statistically significant ( $p=0,05$ ). In other 4 tests (hand dynamometry, shuttle run, sed-leg and flexibility) an improvement of results was observed, however it was not statistically significant ( $p>0,05$ ). The only one variable which remained at a similar level after the experiment included flexibility

Further, detailed analysis of completed empirical data in described group showed that 19-year old girls in comparison to 18-year old ones achieved better improvements in 6 motor tests. It includes: 50 m run, 800 m run, bent arm hanging on the bar, hand dynamometry, standing broad jump and sed-leg.

In the control group comparative analysis of results significantly differs from the experimental group. Among 19-year old girls the results of all 8 tests decreased ( $p>0,05$ ). Eighteen year old girls acquired better result than older girls. The average values of evaluation testing were almost similar in 50 m run, standing broad jump and bent arms hang on the bar. In other 5 tests the results were little worse in comparison to values from initial testing. It should be underlined, that girls from the control group in majority of test achieved worse results than the experimental ones.

## **Discussion**

Presented experimental data showed, that girls participating in water aerobic improved their motor fitness significantly, what was not observed in control group. These results confirm the experimental data from other author's research projects (Eider 199a, 1999b), which showed, that children and youth participating in increased amount of modern forms of movement activity, improve their motor fitness.

Aqua aerobic is one of the forms of aerobic exercise (Eider 2001b, Branska 2002, Kuzminska 1998) that includes the slow developing exercises in the water with additional devices in water according to music. These exercises are aerobic in nature strength and develop of water resistance. This resistance depends on velocity of movements and body part performing it (Rudiger and Häberlein

1997). The water exercises stimulate the cardio-vascular system, influence strength and endurance. Small loads on joints and ligaments make these exer

**Table 1.** Results of fitness tests

Lp.	Variable (ICSPFT)	Group	18 years		p	19 years		p	
			Before	After		Before	After		
			experiment	experiment		experiment	experiment		
			$\bar{x} \pm SD$	$\bar{x} \pm SD$		$\bar{x} \pm SD$	$\bar{x} \pm SD$		
		I	II			I	II		
1.	50 m run	E*	8,21 ± 0,41	7,42 ± 0,31	+	8,82 ± 0,44	7,69 ± 0,21	+	
		K**	8,83 ± 0,52	8,80 ± 0,47	-	8,91 ± 0,41	9,04 ± 0,39	-	
2.	Standing broad jump (cm)	E	167,0 ± 15,7	169,8 ± 16,3	+	166,4 ± 17,7	170,1 ± 16,7	+	
		K	168,2 ± 14,3	168,5 ± 13,9	-	163,7 ± 15,1	163,1 ± 16,1	-	
3.	800 m run	E	226,2 ± 1,84	212,3 ± 3,10	+	238,2 ± 4,30	221,4 ± 2,14	+	
		K	229,3 ± 2,18	230,7 ± 2,34	-	236,3 ± 3,12	237,1 ± 2,91	-	
4.	Grip- strength (kg)	E	29,6 ± 4,7	31,4 ± 2,2	-	26,8 ± 4,4	29,8 ± 2,1	-	
		K	27,5 ± 4,9	27,4 ± 3,9	-	26,7 ± 4,1	26,5 ± 3,8	-	
5.	Bent-arm hang	E	11,95 ± 3,41	14,13 ± 2,21	+	11,51 ± 4,21	15,61 ± 2,41	+	
		K	12,70 ± 4,01	12,71 ± 2,31	-	12,31 ± 3,07	11,91 ± 2,91	-	
6.	Shuttle run 4×10 m	E	11,35 ± 0,33	10,84 ± 0,21	-	10,80 ± 0,31	10,43 ± 0,34	-	
		K	12,71 ± 0,49	12,74 ± 0,39	-	12,94 ± 0,42	13,03 ± 0,38	-	
7.	Sed-leg	E	25,6 ± 2,7	26,9 ± 2,8	-	23,4 ± 1,8	25,1 ± 1,9	-	
		K	20,1 ± 3,7	20,0 ± 3,9	-	19,3 ± 2,7	19,1 ± 3,1	-	
8.	Flexibility	E	14,2 ± 3,1	15,3 ± 2,4	-	14,3 ± 1,9	14,3 ± 1,5	-	

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K	11,4 ± 2,9	11,2 ± 2,8	-	10,9 ± 3,1	10,8 ± 3,3	-
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*E\** - experimental group, *K\*\** - control group, „+” *p*< 0,05, „-” *p*>0,05

cise safe. In water environment the loads affecting joints and muscle are smaller, while the high intensity of work may be registered at lower values of heart rate even by 10-15% compare to similar exercises in the gym (Olex 2001).

The presented results show, that specific exercises performed in water aerobics influence positively the development of abilities dependent strength of upper and lower limbs. It included the 50 m run, standing broad jump, 800 m run and bent arm hanging on the bar. The increase in the above mentioned tests were statistically significant ( $p=0,05$ ). In the control group – as it was assumed – there was no improvement in any of the tested motor ability.

Water aerobic is, after traditional gym in aerobic (Groos and Rothmaier 1997, Suchanowski 1997) and callanetics (Eider 1994b, 1997, 1998, 2001) the next modern form of gymnastics, which influence positively motor fitness, what was confirmed by the results of this experiment.

### Conclusions:

1. Significant improvement in motor fitness of girls participating in aquaaerobic was registered.
2. Specific exercises performed during water aerobic, significantly influenced the level of motor abilities, dependent on upper and lower limb strength.
3. Presented and used in the experiment water aerobic lesson may be proposed to physical education classes in high schools, colleges and fitness clubs.

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