



Volume XXI 2018

ISSUE no.1

MBNA Publishing House Constanta 2018



Scientific Bulletin of Naval Academy

SBNA PAPER • **OPEN ACCESS**

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To cite this article: Sanda Toma-Urichianu, Adrian Urichianu and Bogdan Andrei Urichianu, Scientific Bulletin of Naval Academy, Vol. XXI 2018, pg. 299-304.

Available online at www.anmb.ro

ISSN: 2392-8956; ISSN-L: 1454-864X

doi: 10.21279/1454-864X-18-I1-045

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Dynamics of speed development at 12 to 14 year swimmers by adding effort recovery

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Abstract. Swimming contributes to recording, studying, analysing and interpreting data on the whole phenomenon of motor skills development as a landmark. This activity has an important role to play in optimizing motor capacity and speed development, and it will benefit from substantial improvements due to profound, scientific nature of the study.

It was assumed that by using the recovery method within the weekly training of swimmers, the speed of movement will gradually improve without too much evidence of fatigue, helping them achieve the desired results.

The hypothesis of the paper is the modification of the speed of the 25m and 50m events using 12.5m start-up swimming and methods of effort recovery.

Results. By combining 12.5m swimming methods and effort recovery, the value of 12-14 years old swimmers' results is positive.

Key words: swimming, methods, training, motor capacity, performance.

Introduction. Sports training is a systematic and pedagogical process, gradually adapting the human body to intense physical, technical and tactical efforts, to obtain high results in one of the most competitive forms of exercise [4].

In performance sports, sports training is an extremely complex process involving several components: the pedagogical, biological, social, psychological, hygienic, ethical, and aesthetic one[2]. Physiologists call training, the whole body adjusting its needs (at the level of apparatus and systems) that determine its functional and morphological adaptation, which finally leads to increasing the effort capacity.

Sports training represents the training of athletes to obtain the best results in a certain sports field, in our case, in swimming. Swimming, along with cycling, canoeing, athletics, etc. is a cyclic sport that develops physical qualities such as speed, strength and endurance.

To reach performance in swimming events, the practitioner needs the essential psychic qualities: intelligence, will, seriousness, trust, competitive spirit, tenacity, honesty and fair play. [7].

Teaching sports performance in aquatic sports is a complex and is a difficult process causing stressful situations due to the specific nature of the environment. No less difficult is the problem of breathing and recovery from of fatigue after a training session, event, training stage, or competition year [6]. The sports performance depends on numerous factors:

- ✓ -quality of athletes;
- ✓ -quality of training given by coaches;
- ✓ -medical assistance;
- ✓ - sport management;
- ✓ -facilities and equipment;
- ✓ -motivation and drive.

Recovery is integrated into the current day training schedule as a special process. That is why recovery after the training session and competitions is considered as an important means of training the athlete [5].

Within the sport activity, the rehabilitation process of the effort capacity is more complex and refers to: [1]:

- ✓ Recovery sessions can be active or passive;
- ✓ Hydro-physio therapeutic procedures;
- ✓ Healthy life style (proper diet and sleep).

Fatigue is a mental and physical stage resulting from efforts. It manifests by a disruption of body functions and a decrease of performance in time[11]. This stage is momentary and reversible, and it represents a complex phenomenon that includes physical and mental processes.

Fatigue is the determining factor in progress in sports training; it is the decisive trophic factor in increasing exercise capacity[9].

A well-designed training at optimum intensity and volume ensures the development of whole body muscles [8]. In the end, the body is prepared to the initial state of biological and psychological relaxation. Rehabilitation after training sessions and competitions is a multidimensional effort, requiring different ways such as relaxation techniques, nutrition (vitamins, proteins, etc.) and hydration[3]. There are three regenerative phases to get optimal results: before, during and after competition or the training session. The efficient training requires constant and permanent rehabilitation stages[10]. Rehabilitation facilitates recovery after the training session and maintains a high physical condition and psychological state. The key rehabilitation should include the following[12]:

- balancing effort to rehabilitation;
- eliminating social stress factors;
- team spirit, a calm, trustful and optimistic climate;
- a proper and varied diet, adjusted to swimming and the training stage;
- active rest and participation in pleasant and relaxing social activities;
- constant monitoring of each athlete health condition

The undertaken study. The study was conducted at the Snagov Sports High School from September 2015 to July 2016 in the IVth grade students. The research included a control group and an experiment group, each group consisting of 10 athletes, 6 boys and 4 girls. These athletes aged 12-14 years are trained 5 times a week, each training lasts 60 minutes

The training session is made up of warm-up exercises, on soil, scheduled training session on water, ending with rehabilitation after effort and recovery that consists of a warm shower, hydration, hyper caloric food, and sleep. Twice a month the athletes take part in competitions.

During the study period, the control group performed the scheduled training proposed by the coach, and the experiment group had the scheduled training changed by adding additional recovery procedures.

These procedures consisted of:

- ✓ Stretching after training
- ✓ Sauna - 8-10 minutes
- ✓ Massage - 15-20 minutes
- ✓ Hydro-electrolytic Rehabilitation on natural juices
- ✓ Active rest: walking outside

We assumed that using complex rehabilitation methods in weekly swimmers' training, the speed of movement will gradually improve without too much evidence of fatigue, helping them achieve the desired results.

The hypothesis of the study. Using the 12.5m start-up swim and body rehabilitation methods after the effort, we can improve the crawl style swimming speed in the 25m and 50m crawl events at the athletes in the experimental group.

The Methods of research. The observation method by which we assessed the training of the athletes and we found out that the results from the training are influenced by the rehabilitation of the previous day, the method of specialized literature in which we studied the publications and works of the authors in the field, the statistical method by which I registered results from competitions, training and the graphical method used to interpret the findings and conclusions of the study.

The results obtained from the tests were recorded and put in tables. The athletes were tested in October to determine the level of training (initial TI testing) and at the end of the research period in June, final testing (TF) was performed, which consisted of the same tests as the initial testing.

No	TI						TF					
	Series I			Series II			Series I			Series II		
	I	II	III	I	II	III	I	II	III	I	II	III
1	6.81	6.79	6.78	6.69	6.79	6.95	6.75	6.85	6.68	6.74	6.79	6.71
2	6.90	6.95	6.89	6.72	6.76	6.77	6.82	6.87	6.87	6.89	6.88	6.86
3	6.66	6.58	6.61	6.58	6.72	6.68	6.69	6.62	6.68	6.68	6.64	6.62
4	6.80	6.74	6.83	6.76	6.80	6.82	6.86	6.84	6.72	6.89	6.78	6.85
5	6.55	6.58	6.50	6.51	6.56	6.60	6.62	6.69	6.68	6.65	6.70	6.79
6	7.00	6.95	7.03	6.85	6.90	6.87	6.90	6.82	6.82	6.88	6.83	6.80

Table 1 Results obtained by boys control group at 2 (3 x 12, 5 m) free style. Note: TI=initial testing, TF=final testing

Athletes were tested in October to determine the level of training. The chronometric distance was 12.5 m and consisted of start and launch after start. Events were repeated 6 times in two series, with 30 second pauses between repetitions and 1 minute between the evening. At the end of the research period in June, final testing was carried out, which consisted of the same tests as the initial testing.

From the table, we note that some progress has been made with athletes, some have achieved the same results and some athletes have achieved inferior results at the final test.

N	TI						TF					
	Series I			Series II			Series I			Series II		
	I	II	III	I	II	III	I	II	III	I	II	III
1	6.56	6.59	6.58	6.69	6.59	6.62	6.46	6.51	6.49	6.45	6.43	6.47
2	6.60	6.65	6.59	6.62	6.66	6.67	5.68	6.65	5.70	6.01	6.89	5.90
3	6.66	6.58	6.61	6.58	6.72	6.68	5.55	5.59	5.58	5.45	5.56	5.55
4	6.45	6.50	6.53	6.49	6.50	6.52	5.89	5.87	6.02	5.90	5.74	5.89
5	6.55	6.58	6.50	6.51	6.56	6.60	5.65	5.70	5.68	5.84	5.56	5.89
6	7.00	6.95	7.03	6.85	6.90	6.87	6.30	6.32	6.45	6.35	6.49	6.58

Table 2 Results obtained by boys control group at 2 (3 x 12, 5 m) free style. Note: TI=initial testing, TF=final testing

We see from the table that the athletes from the experimental group, the boys, have achieved better results at the final test than the initial testing. Better results were recorded in both series of athletes.

No.	TI						TF					
	Series I			Series II			Series I			Series II		
	I	II	III	I	II	III	I	II	III	I	II	III
1	6.93	6.90	7.03	6.91	6.90	6.98	6.83	6.88	6.88	7.03	6.74	6.75
2	6.25	5.95	6.82	6.60	6.70	6.81	6.32	6.33	6.25	6.34	6.42	6.39
3	7.00	7.33	7.38	7.03	7.20	7.35	6.90	7.33	7.00	6.88	7.12	7.09
4	7.52	7.51	7.62	7.49	7.53	7.59	7.37	7.40	7.35	7.52	7.15	7.20

Table 3 Results obtained by girls control group at 2 (3 x 12, 5 m) free style. Note: TI=initial testing, TF=final testing

The control group made up of sportsmen registered slight progress, and in some repetitions the results stagnated.

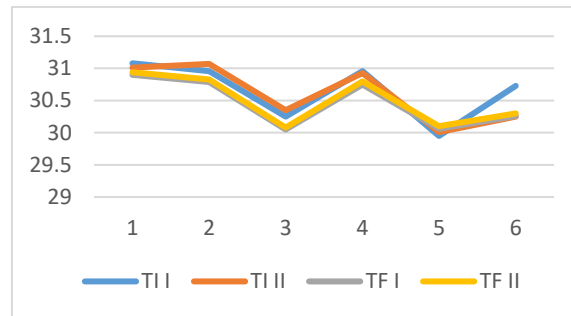
N o.	TI						TF					
	Series I			Series II			Series I			Series II		
	I	II	III	I	II	III	I	II	III	I	II	III
1	6.80	6.95	7.03	6.81	6.90	6.98	5.78	5.76	5.77	5.83	5.85	5.70
2	6.70	6.75	6.82	6.67	6.70	6.81	6.32	6.33	6.28	6.30	6.29	6.30
3	7.00	7.33	7.38	7.03	7.20	7.35	6.51	6.42	6.50	6.45	6.48	6.60
4	6.52	6.51	6.62	6.49	6.53	6.59	6.45	6.43	6.41	6.50	6.50	6.43

Table 4 Results obtained by girls control group at 2 (3 x 12, 5 m) free style. Note: TI=initial testing, TF=final testing

The control group made up of sportsmen registered slight progress, and in some repetitions the results stagnated.

No.	TI		TF	
	I	II	I	II
1	31.08	31.01	30.90	30.94
2	30.96	31.07	30.79	30.83
3	30.25	30.35	30.05	30.08
4	30.96	30.93	30.75	30.80
5	29.95	30.01	30.06	30.10
6	30.73	30.25	30.26	30.30

Table 5. Results obtained by boys control group at 2 x 50 m proba: free style (crawl). Note: TI=initial testing, TF=final testing

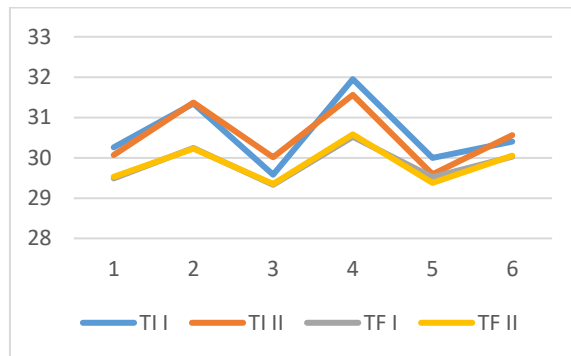


Graph 1 Results obtained by boys control group at 50 m crawl event

The free 50m event is the competition test and the motivation of the effort is objective, the desire to compete with colleagues. Athletes have made slight progress between the two tests.

No.	TI		TF	
	I	II	I	II
1	30.26	30.07	29.49	29.53
2	31.35	31.37	30.24	30.23
3	29.58	30.01	29.33	29.35
4	31.95	31.56	30.52	30.58
5	30.00	29.59	29.52	29.38
6	30.40	30.56	30.03	30.05

Table 6. Results obtained by boys control group at 2 x 50 m free style. Note: TI=initial testing, TF=final testing

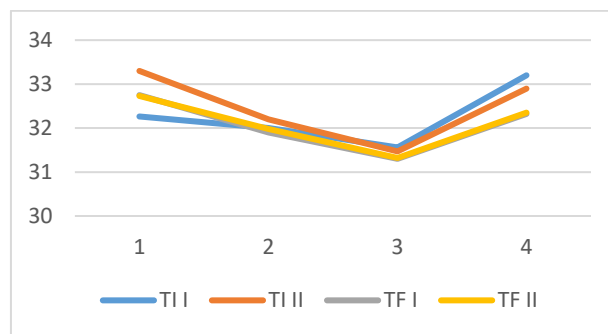


Graph 2 Results obtained by boys control group at 50 m free style swimming event. Note: TI=initial testing, TF=final testing

In the experimental group, we notice that the athletes have made significant progress, the times for the final test are much better. TF1 and TF2 showed much better results for athletes compared to TI1 and TI2.

No.	TI		TF	
	I	II	I	II
1	32.26	33.30	32.75	32.73
2	32.00	32.20	31.90	31.98
3	31.56	31.47	31.30	31.32
4	33.20	32.90	32.32	32.35

Table 7 Results obtained by girls control group at 2 x 50 m free style. Note: TI=initial testing, TF=final testing

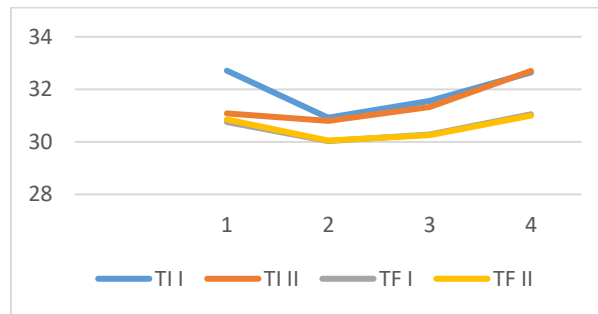


Graph 3 Results obtained by girls control group at 50 m swimming free style event.

In the control group, at the free 50m test the athletes got better times than the initial test, but the progress was insignificant.

No.	TI		TF	
	I	II	I	II
1	32.71	31.08	30.75	30.85
2	30.92	30.80	30.03	30.05
3	31.56	31.33	30.28	30.25
4	32.64	32.70	31.05	31.00

Table 8 Results obtained by girls control group at 2 x 50 swimming free style event. Note: TI=initial testing, TF=final testing



Graph 4 Results obtained by girls control group at 50 m swimming free style event.

And the girls from the experiment group confirm better results, which show that the training was performed at higher effort indicators

Interpretation of results. Following the results obtained, we can see that the experimental groups obtained superior results from the control groups and have made significant progress as performances. Improvement of the indicators was recorded both at start-up swimming on the 12.5m distance and at the 25m and 50m events at the girls and boys who had in the recovery program several forms of recovery after the training.

Conclusions. By applying a complex body rehabilitation program after effort, the value of 11-year-old swimmers' results has improved, which has been seen by increasing the speed of the contest distance. Applying diversified and larger rehabilitation methods to the experimental group led to recovery of the body's functions and faster recovery after the training session fatigue. By the body rehabilitation from training session efforts, muscle overload did not take place and muscles and joints were used at more efficient rate.

Recovery has had positive and created a state of physical and mental comfort because an effort generates fatigue that produces stress and after the body returns to rest, the athlete is optimistic and willing to participate with enthusiasm and dedication to a new training session

Post-effort recovery has also been done through nutrition and hydration, aiming at restoring the amount of fluids and minerals needed for good body functioning.

Applying rehabilitation methods has been made much easier immediately after the effort than later by restoring the body's energy supplies.

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