

Simultaneous Manner Effect of the S. A. Q. Exercises on Some Biochemical Indicators and the Achievement of 50-meter Freestyle swimming

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Abstract

This research aims to identify the biochemical effects of subjecting (50) meter freestyle swimmers to the simultaneous manner of the S.A.Q exercises, in addition to its effect on the time of completing this distance. The experimental approach depends on designing two experimental, control, equal and equal in number groups. It was subject on 100% deliberately chosen sample of the 12 swimmers of (50) meters freestyle swimmers in the Iraqi Youth National team for the sports season (2019-2018). The biochemical tests indicators and achievement time included both Sodium and Potassium tests. The experiment was in the form of complex exercises that combine muscular strength training, that is using different resistances in a simultaneous manner, with training intensity, ranging from (85-95%) of the maximum strength for swimmers, and with repetitions of (1-4) with (2-5) minutes rest between exercise and another, according to the phosphagenic energy system, determinants with (4) varied exercises, targeting exchange in the work of muscle groups. It is given at the basic of the training unit by adopting (8) weeks gradual training for (3) units per training week. After completing the experiment and its pre and posttests The data was processed using the (SPSS) system. From all what is proceeded we conclude that: The S.A.Q exercises in the simultaneous manner positively affect the improvement of the level of condensation of the mineral elements "Sodium and Potassium" and the completion time of (50) meters free swimming of young swimmers during special preparation. when putting simultaneous S.A.Q exercises in action, It is important for trainers to take care in following free ways of compound exercises complexities especially when using resistances outside water. it is, also, important for the trainers not to exaggerate the training load, and supporting their knowledge of integrating methods into the training mixture in a way that allows young swimmers to cross the threshold of their numbers in the time of completing (50) meters free swimming distance .

Keywords: S.A.Q exercises, simultaneous technique, (50)meter freestyle swimming.

swimmer's ability to change his positions in the air, and quickness is the maximum contraction or kinetic response of the muscle in the least possible time." (Medhat and Mohamed, 2017).

Crossing the achievement steps imposes a lot of demands on swimmers in order to reach international professionalism. Thus the trainers try to apply the most important of this demands in order to achieve synchronization in the development goals or improving the

Research problem and its importance:

Increasing the high transitional speed imposes on 50-meter freestyle swimmers to have a high levels of physical and motion abilities, as "The associative relationship nature between the three training elements: transitional speed, agility and quickness. Transitional speed is the player's ability to perform sequential and similar movements in the shortest possible time, while agility is the

sciences, especially while forming its various knowledge and information. And thus, sport training is the outcome of that interconnected mixture of different sciences. This is due to the reason that this science aims to improve the development of human physical performance in order to achieve the highest sport levels". (Wajdi, 2018), that is for "S.A.Q training is an integrated training system that aims to improve the level of acceleration, coordination between eyes and hands, as well as the explosive ability and speed of response." (Remco & et al, 2009), also, "Sakyo exercises are one of the training forms that contribute to improve some special physical abilities, speed of all kind is the most important." (Zoran & et al, 2011).

The genetic factor imposes its presence, especially on those who train to exceed the speed threshold, the swimmers should seek to improve their speed and not to develop muscle tissue, and thus speed training is linked to muscle strength trainings such as: transition Speed, Agility and Quickness, which are related to muscle strength training, as the simultaneous method is defined as "the method that balances the using resistances of the strength training, flexibility and endurance to affect the muscles skills." (Mikkola & Other, 2007)

synchronous training is "A high intensity weight training followed directly by Plyometric exercises with the aim of improving one physical characteristic, which is muscular ability, in which a group of weights is performed first and then a plyometric group within a mechanically similar training series, meaning that the muscle groups used in weight training must be the same used in plyometric exercises." (Ebben & Others, 2000). So,

"one of the reasons for relying on simultaneous training is the modifications that occur in the internal environment of the body, which is a reaction to the various training stimuli resulting from multiplicity in the same training unit." (Mustafa, 2015). The physiological responses to this type of training mixtures in swimming training units must be carefully monitored in order to serve both the health of the swimmer and his achievement, as

achievement of swimmers. That leads to the appearance of different training methods that put into practical use in more than one sport, SAQ method is one of them, as "the term SAQ is derived from the initial letters of each of: Speed, Agility and Quickness." (Mario & et al, 2011), as "The SAQ exercises are considered as training method that is based on training practices and instructions aimed to develop dynamic balance, improve basic motion skills and to control the body parts". (Mohammed, 2018).

Modern sports training has taken an organizational structure by using modern and scientific means that agree with the new developments in training process, put away the traditional methods, and adopt new means and methods according to a codified ways that lead to aware the impact of sports training in developing many Physical, skill and physiological indicators." (Adel, 2014). That will prompt swimming coaches to reconsider the adoption of training methods that serve more than on purpose that achieve development goals simultaneous with physical factor installed in the training unit.

One of these training methods could be adopted when considering that "A coach who does not have the correct knowledge of these sciences will not be able to develop his swimmers in an appropriate manner because he will not be able to identify the real reasons of body's adaptations, whether they are physical, physiological or psychological pressures, etc, and modern sports sciences which help to discover and predict swimmers physiological characteristic facts, in addition to the various overlapping effects of physical load, recovery forms, food regimes, as well as biomechanical factors that increase the modern player kinetic ability performance. (Kmal et al., 2001).

In this research, coaches' knowledge help to overcome the difficulties in combining training methods, that suit the requirements of (50) meters swimming freestyle, and to achieve a kind of required integration "the most important characteristic of sports training is its connection to theories and foundations of other

(Lauralee, 2018) "Damaging in local homeostatic responses, another group of responses that differ from reflexive actions, happen when a change occurs in the internal or external environment, this change is considered a warning of cellular activities changes and ends to anti-stimulation result. This means that this response starts and ends, like all responses, with responses, but it differ from the reflexive action that it occurs only in the stimulation region." (Milteer & Other, 2012) "Muscle cells' chemistry researches has proven that mineral salts maintain the internal environment and has an essential role in formatting many tissues. Our body needs mineral salts to keep its strength and vitality, they also help in many vital functions during body motion..... Saving muscle contraction during motion performance has a great importance, as it decreases tension and cramp on the joint during movement, it also increases the muscle contraction that opposes the performance. All this serves swimmers more than other sportsmen, as the faster work rate in the muscles must be equipped with (ATP). From biochemist point of view that fatigue occurs as a result of the inability to prepare (ATP) energy o in the proper time to be used" (Abdul Rahman, 2010)

It seems that the matter is not complicated when directing and adapting the two training methods investigated towards the biochemical balance of body important salts or the preservation of important salts within the healthy limits for the purpose of improving the time of a 50-meter freestyle swimmers completion.

The researcher noticed, through his academic work in the physiology of sports training and as a specialized youth trainer, the actual need to try multiple and not exaggerated directions exercises that it can serve several purposes at the same time without intersections or side effects for the swimmer. That makes this research aims to prepare S. A. Q exercises in a simultaneous manner for (50) meters freestyle swimmers, and to identify its effect on some biochemical indicators and the time of completion. The researcher supposes that there

metals are found in swimmers cells at the shape of positively charged ions that effectively contribute to the processes of demolition and synthesis of protein and carbohydrates, it regulates the movement of fluids in the body and regulates the osmotic pressure of blood and body fluids. It also plays a major role in stimulating muscles, nerves and regulating body PH.

Thus, muscle biochemistry and its output produce the required strength while simultaneous method aims to improve: transitional speed, agility and kinetic speed (Quickness). This is available with the ratios of mineral elements and safety of metabolic efficiency, ad avoid the risks that may hit this category of swimmers. The importance of Potassium and Sodium is that they are responsible for the absorption of Carbohydrates in the intestine, muscle contraction, support the amount of water inside the cells of the body, and regulate the pH of the blood and various body fluids.(Ayed and Firas, 2020)

Sodium also has a role that helps to maintain blood pressure at normal levels, supports neuromuscular work, and regulates fluid balance in the body, Sodium normal level in the blood is (135-145) mEq/L, Hyponatremia occurs when sodium level in blood falls below 135 mEq/L

RAA is Renin Angiotensin Aldosterone System, consumption of Sodium and excretion of Potassium from the kidneys, so the increase in the secretion of one of these substances: Renin, Angiotensin and Aldosterone, causes excessive excretion of Potassium from kidneys, which causes shortness of blood potassium level, that would be the reason of weakness, muscle aches and muscles weakness, and severe cases occur because of the muscles weakness respiratory failure, addition to heart ventricular rhythm disturbances. (Faguy, 2012). "Potassium, Sodium and Magnesium regulate the acid-base balance within the muscle cell, and maintain high physical activity that entails chemical reactions and increase alkalinity, in addition to its role in regulating osmotic pressure."

The researcher prepared S. A. Q. exercises in the simultaneous style for the swimmers of the experimental group based on what was stated in the reference frame of the literature and the studies that he dealt with.

And according to what is targeted for the mentioned improvements that are included in the S. A. Q. exercises and in the form of complex exercises that combine different resistances muscle strength training in conjunction with those improvements required from exercises within (85-95%) training intensity, the maximum strength for swimmers and with repetitions of (4-1), (2-5) minutes rest time between one exercise and another according to the determinants of the phosphagenic system of energy, and with (4) diriment exercises that aimed the exchange muscle groups' work, that is given at the beginning of the main section of the training unit and with Adaptation of (8) weeks gradual training load at a rate of (3) units per week, as "organizing the training program in a synchronized manner is applied by applying (3-6) units (training doses) per week with the undulation of training load plan, and with high to maximum difficulty exercises to have its clear and tangible effect at the level of muscular ability and endurance." (Mikkola & Other, 2007)

Also, "there must be rationing in the load components of intensity, size and comfort that wouldn't cause any health, physical or technical damage to the athlete." (Hussein and Amer, 2006). And after the completion of the experiment and its pre and posttests, the data were processed by using the SPSS system for the values of percentage, mean, standard deviation, uncorrelated t-test samples, and correlated t-test samples.

are statistically significant differences between pre and posttests for Sodium and Potassium and the time of 50-meter freestyle swimming completion, for the experimental and control groups. There are a statistically significant differences between the results of the two research groups, the post-control level experimental tests for Sodium and Potassium, and the time of 50 meter free swimming completion.

Research Methodology: The experimental method, adopted in this research, defined as "a deliberate and controlled changes of the incident, specific conditions in addition to observation and interpretation of the resulting changes." (Rahim, 2008), as the experimental design of a single experimental group with tight control in the pre and posttests was chosen.

The research community and its sample: The limits of the research community were represented by (12) swimmers, aged (15-17) years AD, in the Iraqi youth team of (50) meters freestyle swimmers for the sports season (2019-2018), all of them are 100% deliberately chosen from their origin community because they are the studied community phenomenon in the research problem.

Measurement, tests and procedures: After a 50-meter freestyle achievement test, (5 cc) of each swimmer's blood was drawn and each was placed in a 1.5 (m L) tube, to which (1000) u. L of red blood cell analysis solution was added to achieve the laboratory tests that extract quantitative values for each of sSodium and Potassium. In order to measure the completion time, an electronic stopwatch was used, and according to the logical sequence of procedures, the tests type did not need exploratory experimentation.

The results and their discussion:

Table 1. Results of pretest for the study and control groups

The tests	Leven	Sig	Experimental Group			Control Group			(t)	Sig	Ass.
			N	Mean	±SD	N	Mean	±SD			
Na	0.055	0.819	6	136.83	1.602	6	137.5	1.643	0.712	0.493	N.S

K	3.788	0.08	6	3.95	0.164	6	3.983	0.248	0.274	0.79	N.S
(50) meter freestyle swimmers	0.027	0.873	6	43.83	1.169	6	43.5	1.049	0.52	0.614	N.S

df(N-2)=10 Significance level = 0.05; t-test value is significant at p-value \leq 0.05

Table 2. Results of the study and control groups in the pretest and posttest

The tests	Group	Pretest		Posttest		Mean Differences	±SD Differences	(t)	Sig	Ass
		Mean	±SD	Mean	±SD					
Na	Ex	136.83	1.602	142.67	0.516	5.833	1.835	7.787	0.001	S
	Co	137.5	1.643	139.33	1.51	1.833	0.753	5.966	0.002	S
K	Ex	3.95	0.164	4.883	0.075	0.933	0.121	18.878	0.000	S
	Co	3.983	0.248	4.15	0.281	0.167	0.121	3.371	0.02	S
(50) meter freestyle swimmers	Ex	43.83	1.169	41.5	0.548	2.333	1.211	4.719	0.005	S
	Co	43.5	1.049	42.67	0.816	0.833	0.408	5	0.004	S

Significance level = 0.05; t-test value is significant at p-value \leq (0.05) df N-1=5

Table 3. Results of posttest for the study and control groups

The tests	Experimental Group			Control Group			(t)	Sig	Ass.
	N	Mean	±SD	N	Mean	±SD			
Na	6	142.67	0.516	6	139.33	1.51	5.13	0.000	S
K	6	4.883	0.075	6	4.15	0.281	6.173	0.000	S
(50) meter freestyle swimmers	6	41.5	0.548	6	42.67	0.816	2.907	0.016	S

Significance level = 0.05; t-test value is significant at p-value \leq 0.05 df(N-2)=10

swimmers to the effect of experimentation through the independent factor represented by S. A. Q. exercises in a simultaneous manner outside the water medium, which helped the swimmers maintain the salt balance of each of sodium and potassium according to the relationship of high intensity exercises between them, and that is in order to fit time of rest between repetitions and groups and between one exercise and another.

The good rationing has proven that these exercises are free of complications, and

The results of Table (2) show that the 50-meter freestyle swimmers in the two research groups have improved the level of biochemical concentration indicators within the health limits, and they finish their free swimming of the distance investigated in the post tests than they were in the pretests as Table (3) results shown. The swimmers of the experimental group outperformed the swimmers of control group in these post results, and the researcher attributes that improvement and superiority of the experimental group

As sports training leads to various physiological changes, including all vital body systems, these changes occur at the level of cells and tissues, and it include anaerobic and aerobic changes that produce the needed energy for athletic performance, due to its capacity and depth of dealing with sports physiology during the previous years. Researchers were able to obtain important physiological information and facts that contributed to the development of sports training (Omar, 2018).

Abstracts and applications:

1- S. A. Q. exercises in a simultaneous way affect positively in improving the level of mineral elements concentration: sodium and potassium and the time of (50) meters free swimming completion of young swimmers during the period of special preparation.

2- It is necessary for the trainers to take care of the proper regulation of S. A. Q. exercises in a simultaneous manner in a way that is free of complex exercises complications, especially when they use resistances outside the water medium, as it is necessary for the muscular work to be similar to the performance in terms of the direction and time of muscle contractions in the 50-meter swim Freestyle, not to exaggerate the training load, and support their methods of training mix knowledge, which allows young swimmers to cross the threshold of their numbers in the time of completing (50) meters in freestyle.

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that helped improvements in physical and motion abilities that are positively affected by the development of muscle strength outside the water medium. It is possible to limit the benefits of S. A. Q. exercises to "they treat and benefit from the lengthening and shortening cycle, which is the bridge that we cross to fill the gap between traditional resistance training and specific functional movements, and it works to increase the muscular ability in all explosive movements, the effectiveness of nerve signals from the brain, kinesthetic perception, motion skills and reaction time. As it works to gain greater balance that allowing the athlete to maintains the correct position of the body during the performance of the different skills, and works to control the intensity of training from low to high, because each athlete has a different level of training and therefore the level of intensity must coincide with the athlete's abilities." (Ashraf, 2015)

The researcher also attributes the improvement of achievement time to mixture of the two styles of S. A. Q. and synchronous training of swimmers training. S.A. Q. exercises are used to improve acceleration, arm action, footwork, response time, explosiveness, and visual awareness, hand-eye-co-ordination, and muscular power. "Training leads to physiological changes that include the body's systems. The level of athletic performance progresses, as long as this changes have a positive results, and that will achieve the physiological adaptation of the body's organs and then to the physical load." (Baha', 2018).

"The gradual increase in the training load is the basis for any training plan, and it should be followed by all players who care about their level of achievement." (Jamal, 2018) As "S. A. Q. exercises stimulate muscle spindles, which advocates high tension in the liberated motion units and excitation of other receptors that increase the number of active motion units. This all could be the reason for increasing the resulting strength and improving skill performance and achievement." (Velmurugan & Palanisamy, 2012)

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