The Effect of SAQ Training for 6 Weeks on the Speed of Reaction of Arms and Legs in Young Boxer Athletes

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The Effect of SAQ Training for 6 Weeks on the Speed of Reaction of Arms and Legs in Young Boxer Athletes

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ABSTRACT

Boxer is a martial arts sport that originates from Indonesia. Boxer is the same as other martial sports that require speed, agility, reaction and great power. A common problem that often occurs in young athletes is the difficulty of developing the speed of reaction of the arms and legs. This study examines the role of Speed, Agility and Quickness (SAQ) exercises on the reaction speed of the arms and legs. The aim of this study was to determine the effect of the treatment of the SAQ training program on the reaction speed of the arms and legs of junior athletes in the boxer martial arts branch. The research method is a pretest-posttest experimental method with Equivalent time-series design. This study was carried out through repeated intervals of research and measured at the 9th and 18th treatments. The population of this study were 18 junior athletes of MAN 2 Medan, and 18 junior athletes of MAN 1 Medan. The sampling technique used random sampling and the sample used 12 young athletes. The instrument used was the Nelson Foot Reaction. Data analysis techniques used the t-test with a significance level of 0.05. The results of this study concluded that there was a significant effect of SAQ training on the reaction speed of the arms and legs.

Keywords: Arms, Legs, SAQ, Speed Reaction.

I. Introduction

Boxer is a branch of martial sports that originated from Indonesia and almost the same as other martial sports. It is also a sport of self-defence art that utilizes compounds of muscle power, brain and conscience realistically and rationally. In the implementation of this sport, it takes several elements of the main physical conditions, namely anaerobic endurance, strength, speed, accuracy, and mental elements that include courage and tenacity. There are always attached dynamically and aggressively within the framework of a system of resilience/self-defence as well as technical patterns, tactics and defence strategies that are practical and effective for self-defence (Ridho Wahyu R and Murtijas S, 2013; 126-129).

In the martial sports, branch requires the speed of movement, especially in the arm's reaction when hitting and parrying and the leg's speed reaction when doing

kick variations. The speed of hitting, parrying and tightening can be done to respond to the stimulus provided by the opponent with various variations (Irwan Setiawan, 2018; 475-484). This is the basis for the reaction of the arms and legs to be done with a variety of planned or unexpected variations. Therefore, the characteristics of the boxer need the speed of reaction of the arms and legs (Muhammad Chairad, 2016; 11-113). Other bio-motoric components needed are agility, ability to change direction, respond quickly, hit, kick quickly, and dodge. The movements in martial sports require very fast and explosive. The whole movement requires speed, agility and strength as needed for sports that require bio-motoric (Bompa, T. O. 2009).

The speed required in boxer sports is very dominant in the speed of stimulating reaction of arms and legs when defending and responsive in attacking with a blow or kick (Imran Akhmad, Amir S., Rahma, D and Dodi, Y. S., 2019). The quality of the kick depends on the power component to get the power of the punch and kick, while the quality of the reaction ability of the athlete depends on arousing the speed of the move to hit and kick to get the value. Given the importance of arm and leg reactions, one of the exercises that can increase reaction speed and agility is Speed, Agility and Quickness (SAQ) (Johnson, P. and Bujjibabu, M. 2012: 26-30). Reaction speed is the time interval between the stimulus from outside the response with the response (Magill R, Anderson D, 2014).

The training that must be done by an athlete is in line with the needs and characteristics of the movement in the sport. The exercise is done by evoking movement quickly on changing objects and is needed in almost all sports. SAQ is expected to increase the ability of athletes to use force optimally during high-speed movements (Brown, L.E. and Ferrigno, V.A. 2005). The SAQ training method is intended to develop motor skills and control of body movements through the development of the neuromuscular system (Brown, L.E. and Ferrigno, V.A. 2005). SAQ training is a progressive training that leads to the development of the main movement abilities to improve the ability of players or athletes so that it is better and faster in the skills they have (Gregory, J. 2004; Imran Akhmad. 2013).

II.   Method

Based on its characteristics, the research method used is an experiment with the Equivalent time-series design. The stages of the study were conducted through pretest, treatment 1, test 2, treatment 2 and post-test in 2 groups, in other words the treatment group and the control group that were not given treatment. This research was conducted for 6 weeks with frequency 3 times in 1 week and consisted of 2 series. First series was conducted with 9 meetings which ended with a test. While second series was also carried out for 9 meetings and than ended with a final test. All meetings in this study were 21 meetings, i.e. the study was conducted during 18 treatments, pretest and two post-tests. The effect of SAQ training on each training series on increasing quickness will be seen in each series. The study design is as follows:

Table 1. Research Design

Pretest	SAQ	Post test
O_1	X_1	O_2
O_2/O_3	X_2	O_4

Information:

$O_1, O_1/O_3, = \text{pre test}$
$X_1, X_2 \qquad = \text{SAQ}$
$O_2/O_3, O_4 = \text{post test}$

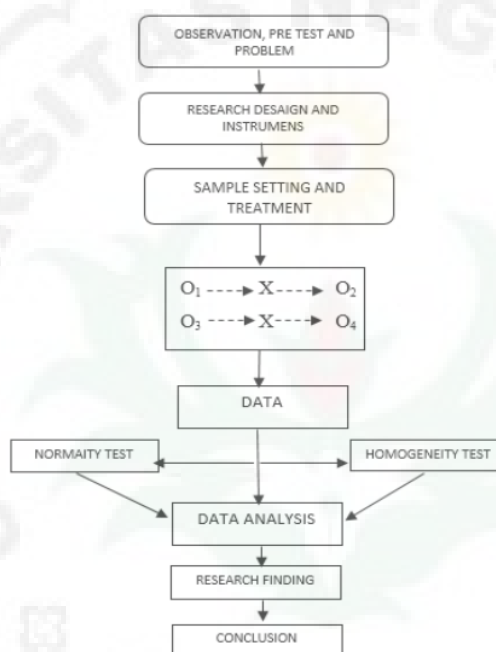The procedures and steps in this research are as follows:

Figure 1. Research Procedures and Steps

Procedure or research steps: (1) pretest is given to 12 athletes of the experimental group conducted simultaneously, it is used as initial data that is given the symbol O1. (2) the treatment of the SAQ training program in the first series given X1 symbol which was carried out for 8 meetings. (3) test medium as O2/O3. (4) treatment of the SAQ training program in the second series given X2 symbol which was conducted during 8 meetings (5) The final test of the sample as the final data have given the symbol O4. The test instrument used in this study was the Nelson Foot and hand Reaction. It is an instrument to measure the speed of reaction of hands and feet.

III. Result

Data from test and measurement results were analyzed using statistical descriptions and the average score of Arm Quickness (HQ) and Foot Quickness (LQ) results. Data scores in this study can be described in table 2 below:

Table 2. Description of Research Data

Test	Variable	Training	Mean	Std. Dev.	Conf. interval α = 0.05	
					Lower Score	High score
Pre tes	AR	NA	14.75	3,59	21	9
O_1	FR		14,33	4,16	21	6
$O_{2,3}$	AR	SAQ	12,17	3,43	18	6
	FR		11,83	3,54	17	5
O_4	AR	SAQ	12.00	3,35	15	5
	FR		11,75	3,91	16	4

Information: AR = Arm Reaction

FR = Foot Reaction

In Table 2 above shows the results of the test measurements can be explained that the pre-test before treatment gained an average of 14.75 reaction arm, the standard deviation is 3.59, the highest score of 9 cm and 21 cm lowest score. The average score of the pre-test of leg reaction was 14.33, the standard deviation was 4.16, the lowest score was 21 and the highest score was 6. Test results in the first series after being treated obtained an average arm reaction of 12.17, a standard deviation of 3.43, the highest score of 6 cm and the lowest score of 17 cm. The average score of the pre-test of leg reaction was 11.83, the standard deviation was 3.54, the lowest score was 17 and the highest score was 5. Test results in the second series after being treated obtained an average reaction arm 12.00, standard deviation 3.35, the highest score of 5 cm and the lowest score of 15 cm. The average score of pre-test reaction limbs 11.91, a standard deviation of 3.91, the lowest score and 16 the highest score 4. The percentage increase in SAQ training results can be seen in Table 3 below:

Table 3. The Percentage Increase in SAQ Training Results in the 2nd Series

Test	Variable	Training	Persentil (%)
Seri 1	AR	SAQ	2,56
	FR		1,21
Seri 2	AR	SAQ	1,01
	FR		1,03

The results of data analysis showed an increase in the results of SAQ training on the reaction of the arms and legs. The increase can be seen in Table 3 above, it can be explained that the 1st series in the arm reaction was 2.56% while the increase in leg reaction was 1.21%. In the second series, there was an increase in the arm's length reaction of 1.01% while an increase in the leg's reaction of 1.03%. The results of the significance test between variables can be explained in table 4 below.

Table 4. Significance of Variable

Test	Variable	Training	Cinf. Int α =0.05	t-table	information
$O_1 - O_2/O_3$	AR	SAQ	2,63		Sig.
	FR		2,48	2,21	Sig.
$O_3 - O_4$	AR	SAQ	3,22		Sig.
	FR		3,27		Sig.

Table 4 shows that SAQ training for nine weeks had a significant effect on both training series on the reaction speed of the arms and legs. In the first series, the variable arm reaction t level was 2.63 and the arm reaction was 2.48 with a significant level α = 0.05. This means that there is a significant effect between SAQ training on the reaction speed of the arms and legs. In the 1st series, the variable arm reaction t level was 3.22 and arm reaction was 3.27 with a significant level α = 0.05. This means that there is a significant effect between SAQ training on the speed of reaction of arms and legs in young boxer athletes.

IV. Discussion

This study examines the effect of SAQ training on the speed of reaction of arms and legs for young athletes. It is not believed that the development of the reaction time of young athletes can be obtained through routine training. To increase occurred required new knowledge about exercise frequency of the treatments is certain about its development. SAQ exercise is an activity that can develop various aspects such as the speed of motion, balance, agility, quickness power, coordination, the balance of perception (Young WB, McDowell MH, Scarlett BJ. 2001., 315-9; N. Anilkumar, 2013; 46-48). Boxer athletes require more speed, agility and power than wrestlers who tend to need endurance and flexibility (Amrinder Singh, Abhinav Sathe, Jaspal Singh Sandhu, 2017; 139-143). SAQ exercises can be varied depending on the needs of the sport. The martial arts, the speed required is the speed of moving when dodging and attacking. Agility is needed when changing the position of the body and change the direction of the body quickly and accurately. On the other hand, the maximum reaction is needed when attacking and responding to the stimulus given by the opponent.

The findings in this study are in line with previous studies that show that the development of faster reaction time at the beginning of Taekwondo practice compared with adult athletes (Song, K.Y. and An, J.D, 2004; 711-723). Likewise, research shows that there is a rapid increase in SAQ training reaction time but does not apply to the development of general physical fitness (Shirley S. M. Fong, Shamay S. M. Ng, Louisa M. Y. Chung, 2013; 1-5).

This research was conducted on young athletes in boxer aged 14-17 years. This research was conducted with two series of premises each series consists of 8 times treatment SAQ drills. The results showed that in the 1st series variable arm reaction speed obtained t count 2.63 and leg reaction speed 2.48 and t table value 2.21 with a significant level α = 0.05. These results concluded that there was a significant effect between SAQ training on the speed of reaction of arms and legs in young athletes. SAQ exercise is a modern training system that results from the integration of various physical abilities (Amr H, 2016). The integration aims to form a body position when competing for that requires speed as the main part, speed to change direction, quickness and agility. In the second series, the arm reaction speed variable obtained t count value of 3.22 and leg reaction speed of 3.27 and the value of t table 2.21 with a significant level α = 0.05. This means that a significant difference between the speed of the reaction SAQ exercise arm and a leg on young boxer.

The increase in reaction speed of the arms and legs results of this study can be used as a guideline that the continuous and programmed SAQ training will increase the reaction speed especially for young athletes aged 14-17 years (Sporis G, Jukic I, Milanovic L, Vucetic V., 2010; 679-686). A fast or slow reaction time

of arms and legs depends on the level of neurosensory system response and neuromotor adaptation. Also, maturity and gender are factors that can cause obstacles in motoric execution, regardless of the time of exercise (Brito. A.V, Silva, Carlos., 2011; 35–39).

Changes to the increase in reaction speed at the beginning of the exercise tend to be faster than in the second series. This can be seen in the percentage increase in reaction speed in the first series of 2.56% while in the second series of 1.01%. While the change in reaction rate leg at 1.21% series and the second series decreased by 1:01%.

V. Conclusion

SAQ training is carried out programmatically and continuously will increase the speed of reaction of the arms and legs for young fighters. The training conducted at 9 meetings in the 1st series showed an increase more faster than the training of 9 meetings in the 2nd series. Should be believed that the young boxer athletes who want to improve the speed of reaction of the arms and legs can use this form of SAQ exercise correctly.

References

[1] Ridho Wahyu R and Murtijas S. (2013), *Theme Metaphor in the Design of the Tarung Derajat Martial Arts Training Center*, Jurnal Sains dan Seni POMITS, Vol, 2. No 2. Pp; 126-129.

[2] Irwan setiawan, 2018. *Profile of Physical Condition Level of Tarung Derajat Athletes of Kediri City in Preparing the Provincial Championship in 2018*. Brilian Jurnal Riset dan Konseptual, Vol 3, No 4; pp. 475-484

[3] Muhammad Chairad, 2016. *State University of Medan Student's Perception on Tarung Derajat Martial Arts in Unimed Rehearsal Unit*. International Journal of Science and Research (IJSR), Vol 5, Issue 2; pp. 11-113.

[4] Bompa, T. O. 2009. *Periodization training for sports*, 5 th Edition. Kendall/Hunt: Publishing Company

[5] Imran Akhmad, Amir S., Rahma, D and Dodi, Y. S,. 2019. *The Influence of SAQ on Speed and Agility for Futsal Young Athletes on X-Trail 14 Futsal Academy.*, International Journal of Science and Research (IJSR), Vol. 8 Issue 12.

[6] Johnson, P. and Bujjibabu, M. 2012. *Effect of Plyometric and Speed Agility and Quickness (SAQ) on Speed and Agility of Male Football Palyers*. Asian Journal of Phisical Education and Computer Science in Sport. Vol. 7 No.1 pp 26-30.

[7] Magill R, Anderson D, 2014, *Motor learning and control: Concepts and applications* (10th ed.). New York, NY: McGraw-Hill

[8] Amir S., Imran A., Rahma D. 2018, *Design and Measurement of SAQ "Speed Light" Measuring and Training Tools Visualization of Lighting Based on Infra Red Motion Sensors*. International Journal Sciences and Research, Vol.9. Issue 17.

[9] Brown, L.E. and Ferrigno, V.A. 2005. *Training for Speed, Agility, and Quickness*. Unites States: Human Kinetics

[10] Vallimurugan, V. and Vincent, J.P. 2012. *Effect of SAQ Training On Selected Physical Fitness Parameters og Men Football Palyers*. International Journal of Advanted and Inovation Research. ISSN: 2278-7844. Volume 1, Issue 2, Juli 2012

[11] Gregory, J. 2004. Y*outh Football Speed, Agility, and Quickness and Functional Conditioning Program*. Jack.Gregory@globalcrossing.com.

[12] Imran Akhmad. 2013. *Fundamentals of Physical Training for Athletes*, Medan: Unimed Press.

[13] Young WB, McDowell MH, Scarlett BJ. 2001. *Specificity of sprint and agility training methods*. J Strength Cond Res. 2001; 15(3):315-9

[14] N. Anilkumar . 2013. *comparative study of selected physical components of male boxers, wrestlers and judokas*. Vol. 2. No.4. Des. 2013. ISSN 2277-5447. Pp. 46-48.

[15] Amrinder Singh, Abhinav Sathe, Jaspal Singh Sandhu, 2017. *Effect of a 6-week agility training program on performance indices of Indian taekwondo players*, Saudi Journal of Sports Medicine (SJSM), Volume 17 / Issue 3 / September-December 2017, pp; 139-143.

[16] Song, K.Y. and An, J.D. (2004) *Premotor and motor reaction time of educable mentally retarded youths in a Taekwondo program. Perceptual and Motor Skills*, 99, 711- 723. doi:10.2466/pms.99.2.711-723

[17] Shirley S. M. Fong, Shamay S. M. Ng , Louisa M. Y. Chung. 2013. *Health through martial arts training: Physical fitness and reaction time in adolescent Taekwondo practitioners*. Journal HEALTH, Vol. 5. No.6A3, pp. 1-5. doi:10.4236/health.2013.56A3001. http://www.scirp.org/journal/health/

[18] Amr H, 2016, *SAQ Training*, Arabic book, Egypt

[19] Sporis G, Jukic I, Milanovic L, Vucetic V. 2010. *Reliability and factorial validity of agility tests for soccer players*. The Journal of Strength and Conditioning Research. 24(3), :pp. 679-686

[20] Brito. A.V, Silva, Carlos, 2011. *Reaction Time in Karate Athletes*. Journal of Martial Arts Anthropology", Vol. 11, no. 4, pp. 35–39.

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