

The Effect of Exercise with Ladder Drill Slaloms and Carioca on Speed and Agility

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ABSTRACT

The purpose of this study is to analyze about: (1) the effect of slaloms ladder drill exercises on speed and agility; (2) the effect of carioca ladder drill training on speed and agility; (3) the difference between the effect of the Carioca ladder drill and the Carioca ladder drill on speed; (4) differences in the influence of carioca ladder drill and carioca ladder drill on agility. This type of research is quantitative with quasi-experimental methods. The research design used is matching only design and data analysis using t-test and ANOVA. Retrieval of data using a sprint 30 meters to measure speed and agility t-test to measure agility at the time of the pretest and posttest. The results showed that the difference between the pretest and posttest of each group were: (1) experimental group I for speed = 0.577 and agility = 0.663 (2) experimental group II for speed = 0.81 and agility = 0.757 (3) control group for speed = 0.122 and (4) control group for agility = 0.029. Based on the above analysis, it can be concluded that there is an increase in speed and agility for each group after being given the Ladoca drill ladder drill and carioca ladder drill seen from the t-test. In addition, through the ANOVA test, there are differences in speed in the two types of exercise. Carioca drill ladder increases speed compared to slaloms. While in agility there is no difference between ladder drill slaloms and carioca, but both groups have a better influence than the control group.

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1. INTRODUCTION

Physical condition is a component of training that cannot be separated from athletes. Bad physical condition will affect the athlete's performance during the match. A quality athlete, definitely has a quality physical too. According to Bompa (2009, p.2) to achieve an achievement, four factors are determined namely physical preparation, tactics preparation, technical preparation, and mental preparation. Physical preparation is done through several exercises. Good and right practice will produce good performance. Proper training needs an exercise program. Bompa (2015, p.6) states that training planning and programming consists of periodizations involving two basic concepts, namely the annual plan periodization and the biomotor ability periodization.

One component of physical condition that is very important in some sports is speed (agility) and agility. According to Hoff and Almasbakk (in Johnson, 2012, p. 27) defines that speed and agility as a factor that distinguishes the level of proficiency in sports. According to Mylsidayu (2015, p. 147) agility (agility) is closely related to speed and flexibility. Therefore, an athlete who has good agility will -

be able to make movements more effectively and efficiently.

Looking at the physical training elements above, speed and agility are elements of physical training that cannot be separated and are indispensable in many sports. Proper physical exercise greatly affects an athlete's level of appearance. To support other abilities, an athlete can look excellent if he has good physical condition. Good physical condition can only be achieved if an athlete is doing the exercises correctly and loading correctly during the training process.

Several new training methods have been used to build several biomotor abilities such as Speed, Agility, Quickness (SAQ). This SAQ training method is a popular training method used by almost all athletes abroad. According to Jovanovic (in Milanovic et al, 2013) training in speed, agility, and quickness will remove the pressure and threshold so that it will allow athletes to exert maximum strength so that their movement patterns are controlled and balanced. SAQ training combined with speed significantly increases agility, explosive power and speed (Suresh: 2016, p.80). Ladder drill is a form of training from

SAQ using a tool that is almost like a ladder and serves to teach movement skills. Ladder drill is a form of ladder training that is very necessary to improve leg speed, agility, and foot coordination for athletes, besides this agility ladder technique is very popular for coaches looking for ways to improve speed, coordination, balance, and agility in athletes (Syairulniza, 2015, pp. 18-19).

According to Dhanaraj (2014) that "ladder training will improve our speed, coordination, timing and balance and also it will set our calves on fire". It means, that exercise with stairs will improve speed, coordination, accuracy and balance. Added by Jay Dawes and Mark Rozen, (2012, p. 65) "trainers generally use ladder drill to help athletes restore agility, body control, and awareness in moving, and improve basic skills in moving". The standard size of a ladder is 10 yards, the agility ladder is not only a tool used to develop foot speed, when used in various ways, the agility ladder becomes a multipurpose tool that is as a means of increasing agility and reaction speed.

In conducting agility and speed training using ladder drill, the variations of the exercise are very numerous and varied, but in this study only use two forms of training, namely slaloms ladder drill and carioca ladder drill. The pattern on the carioca ladder drill slaloms and ladder drill is a pattern of movement that can be believed to increase speed and agility. With a variety of simple movement patterns, it is expected that the trainer can improve the physical fitness of athletes in terms of speed and agility so that athlete fitness can be increased.

Theoretically ladder drill training can increase speed and agility, but there are those who do not understand the benefits of this exercise in depth because this term is not yet familiar in various regions. Researchers had made observations at SMAN 1 Rejotangan, almost all extracurricular trainers only focused on technical and tactical exercises. Therefore, based on the above statement, researchers feel interested and want to provide alternative exercises to improve physical conditions specifically in improving the physical condition components of speed and agility. Therefore the researcher will conduct a study entitled "The Effect of the Carioca Ladder Drill Slides and Ladoca Drill Ladders Against Speed and Agility" in Rejotangan 1 High School.

1.1 Focus of Research

First analyze the effect of Ladder drill Slaloms exercises on speed and agility. Second analyzes the effect of the Carioca Ladder drill exercise on speed and agility. Third analyzes the difference in effect between the Ladder drill Slaloms and the Carioca Ladder drill on speed. Fourth analyzes the difference in influence between the Ladoca drill Slaloms and the Carioca Ladder drill on agility.

1.2 Research Object

First effect of Ladder drill Slaloms exercises on speed and agility. Second effect of Carioca Ladder drill exercises on speed and agility. Third difference in effect between the

Ladder drill Slaloms drill and the Carioca Ladder drill on speed. Fourth difference in effect between the Ladder drill Slaloms drill and the Carioca Ladder drill on agility.

2. METHODS

The research method used in quasi-experimental research. Experimental research is research conducted strictly to determine the causal relationship between variables (Maksum, 2012: 65). Experiment is a type of research in which the sample or object of research is given a treatment to find out the cause and effect between variables. Design or design in research using "Matching Only Design" (Maksum, 2012: 100)

Population in this study were students who actively participated in extracurricular activities at Rejotangan 1 High School totaling 93 people. Maksum, (2012, p. 62) recommends the number 30 as a minimum number of samples in experimental research. From the results of these provisions the researchers planned sampling as many as 30 people using a simple random sampling technique by drawing. Treatment instrument intended in this study is the Slaloms and Carioca training program which will be applied to the experimental group of students who actively participate in extracurricular activities at the Rejotangan 1 High School Data in this study were obtained from the results of tests and measurements made on the study sample. Components of tests and measurements carried out in this study are: speed test, and agility test. The speed test uses a 30 meter sprint test, and the agility test uses a T-test.

To analyze the acquisition of data about training using agility and speed tests. Then the test results will be recorded and calculated using the Analysis of Variance (ANOVA) test with $\alpha = 0.05$ (Maksum, 2012, p.161). To meet the assumptions in the ANOVA technique, a Normality and Homogeneity test was performed with the IBM SPSS Statistics 21.0 application. To analyze the acquisition of data about training using agility and speed tests. Then the test results will be recorded and calculated using the Analysis of Variance (ANOVA) test with $\alpha = 0.05$ (Maksum, 2012, p.161).

3. RESULTS AND DISCUSSION

This chapter will describe the data description, the terms of hypothesis testing, and the results of hypothesis testing. Description of the 30-meter sprint test and agility test using a T-test given to the experimental group I, the experimental group II, and the experimental group III to the extra curricular students of the Senior High School 1 Rejotangan sports with a total of 30 people divided into 3 groups, and respectively each group of 10 people.

In the description of the results of this study discusses the mean and standard deviation obtained from the results of tests conducted on each group and the type of exercise applied. Here will be analyzed the results of the

treatment of the 3 groups (slaloms ladder drill group, carioca ladder drill group, and control group). Based on the results of the analysis using SPSS version 21.0, the data description of the research results can be further elaborated.

3.1 Group I, Ladder drill slaloms exercise

Based on the results of measurements in group 1 it can be seen that there is an increase in the mean value between pretest and posttest on the dependent variable. This is evident from the average posttest and pretest mean values. Where can be seen that the average value for the speed of the posttest measurement results (42.27 sec), this looks faster than the results of the pretest measurement (48.04 sec) and the agility of the posttest measurement results (111.89 sec), this looks faster compared to the results of the pretest measurement of (118.52 sec). In giving treatment to group I can be illustrated in the Figure 1.

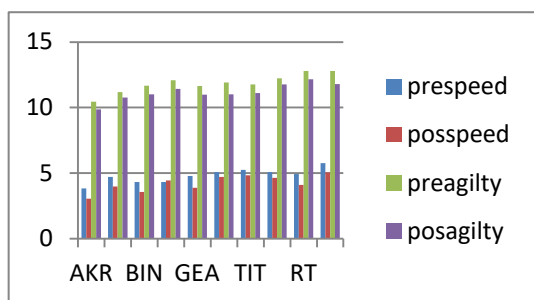


Figure 1. Digram results of group I speed and agility

3.2 Group II Carioca Ladder drill exercises

Based on the results of measurements in group II it can be seen that there is an increase in the mean value between pretest and posttest on the dependent variable. Where can be seen that the average value for the speed of the posttest measurement results (43.09 s), this looks higher compared to the results of the pretets measurement (51.19 s) and the agility of the posttest measurement results (108.83 s), this looks higher compared to the results of the pretest measurement of (116.4 sec). In giving treatment to group II can increase speed and agility.

The overall results of the exercise in group II can be illustrated in the Figure 2.

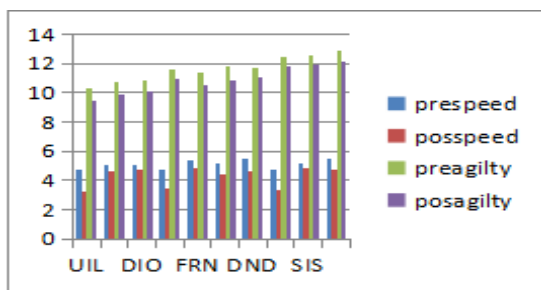


Figure 2. Diagram of the results of group II speed and agility

3.3 Group III, Control

Based on the results of measurements in group III it can be seen that there is an increase in the mean value between pretest and posttest on the dependent variable. Where can be seen that the average value for the speed of the posttest measurement results (49.22 sec), this looks higher compared to the results of the pretest measurement (50.4 sec) and the agility of the posttest measurement results (116.82 sec), this looks more high compared to the results of the measurement of pretets (117.11). From the results of group III there was an increase in speed and agility.

The overall results of the exercise in the control group can be illustrated in the Figure 3.

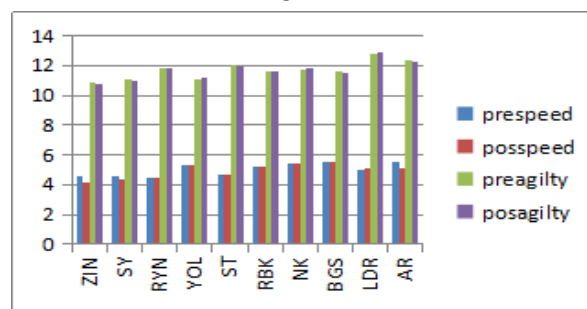


Figure 3. Diagram of the results of group III speed and agility

3.4 Recapitulation of the average results of the exercises in each group

Recapitulation of the average results of the exercises in each group can be seen in the following table:

Table 1. Average Results of Exercises in Each Group

Mean Measurement	Exercise group			
	Slaloms	Carioca	Control	
Speed (scn)	pretest	48,04	51,19	50,4
	posttest	42,27	43,09	49,22
Agility (scn)	pretest	118,52	116,4	117,11
	posttest	111,89	108,83	116,82

From the table above it can be seen that the provision of Carioca drill ladder drills in group II turns out to provide the best speed and agility improvement than the other two groups, namely group I Slaloms ladder drill and group III control.

3.5 Hypothesis Test Conditions

To test whether the results of the descriptive analysis above are significant or not, then the significance test will also be conducted which is also a hypothesis test. The

things needed to find out the hypothesis test in this analysis are as follows:

Table 2. Normality Test Results.

Dependent Variable	Group I ladder drill slaloms		Group II ladder drill carioca		Group III control	
	pretest	posttest	pretest	posttest	pretest	posttest
Speed and Agility						
Speed	0,995	0,978	0,926	0,357	0,933	0,672
Agility	0,874	0,906	0,987	0,988	0,972	0,995
Explanation	normal	normal	normal	normal	normal	normal
Probability	p>0,05					

Based on the table above shows that the overall value of Komlogrov-Sminrov Z shows a number greater than 0.05. As per the testing criteria it can be said that all data are normally distributed.

Table 3. Homogeneity Test Results

Group	Dependent variable: Speed and Agility				Explanation
	Sig.				
	pretest	posttest	pretest	posttest	
Experiment 1 Ladder drill slaloms					
Experiment 2 Ladder drill carioca	0,192	0,429	0,591	0,369	Homogen
kontrol					
	p > 0,05				

Based on the table above the homogeneity test calculation results show homogeneous data. Because it is in accordance with the testing criteria that the Sig. > 0.05 then HO is accepted. So it can be concluded that all pretest and posttest data from the three groups have the same variant (homogeneous). **Table 4.** Results of the Mean Paired Speed Sample Tests

Based on the results of the calculation of the mean paired sample difference test using paired t-test t-test as follows:

1) Group I (Ladder drill Slaloms)

There is a significant effect of providing Slaloms ladder drill training on the speed of male students extracurricular at Rejotangan 1 High School.

2) Group II (Carioca Ladder drill)

There is a significant effect of the Carioca ladder drill exercise on the speed of male students in the

Group	Speed	mean		Sig. (2-tailed)	Explanation
		pre-test	post-test		
Group I slaloms		4,80		0,000	Significant
		4,22			
Group II carioca		5,11		0,000	Significant
		4,30			
Group III control		5,04		0,101	Not Significant
		4,92			

extracurricular Rejotangan 1 High School.

3) Group III (Control Group)

There is no significant effect of training on speed on male extracurricular students at Rejotangan 1 High School.

Table 5. Results of Mean Difference Tests with Paired Agility

Group	Dependent variable: Speed and Agility				Explanation
	Sig.				
	pretest	posttest	pretest	posttest	
Experiment 1 Ladder drill slaloms					
Experiment 2 Ladder drill carioca	0,192	0,429	0,591	0,369	Homogen
kontrol					
	p > 0,05				

Based on the results of the calculation of the mean paired sample difference test using paired t-test t-test as follows:

1) Group I (Ladder drill Slaloms)

There is a significant influence of Slaloms ladder drill training on agility in male extracurricular students at Rejotangan 1 High School.

2) Group II (Carioca Ladder drill)

There is a significant influence of Carioca ladder drill training on agility in male extracurricular students at Rejotangan 1 High School.

3) Group III (Control Group)

There is no significant effect of training on agility in extracurricular male students at Rejotangan 1 High School.

Tabel 6. Results of the calculation of the difference between groups

Multiple Comparisons

LSD

Dependent Variable	(I) Kelompok	(J) Kelompok	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
KECEPATAN	Ladder Drill Slaloms	Ladder Drill Carioca	-.3140000 [*]	15.48667	.053	-63.1760	3.760
		Control	37.40000 [*]	15.48667	.023	5.6240	69.1760
	Ladder Drill Carioca	Ladder Drill Slaloms	31.40000	15.48667	.053	-3.760	63.1760
		Control	68.80000 [*]	15.48667	.000	37.0240	100.5760
	Control	Ladder Drill Slaloms	-.3740000 [*]	15.48667	.023	-69.1760	-5.6240
		Ladder Drill Carioca	-68.80000 [*]	15.48667	.000	-100.5760	-37.0240
KELINCAHAN	Ladder Drill Slaloms	Ladder Drill Carioca	-.40000	8.34275	.962	-17.5179	16.7179
		Control	64.30000 [*]	8.34275	.000	47.1821	81.4179
	Ladder Drill Carioca	Ladder Drill Slaloms	.40000	8.34275	.962	-16.7179	17.5179
		Control	64.70000 [*]	8.34275	.000	47.5821	81.8179
	Control	Ladder Drill Slaloms	-64.30000 [*]	8.34275	.000	-81.4179	-47.1821
		Ladder Drill Carioca	-64.70000 [*]	8.34275	.000	-81.8179	-47.5821

*. The mean difference is significant at the 0.05 level.

Table 7. Results of the Post Hoch Test Calculation of speed and agility

Sources of Varians	Df	F Count Speed	F Count Agility	Sig.	Sig.	Explanation
Between groups	2					
In Group	30	9,893	39,849	0,001	0,000	Significant
Total	32					

Based on the table above, there is a significant difference between the results of the Slaloms ladder drill, the Carioca ladder drill, and the control group on speed and agility.

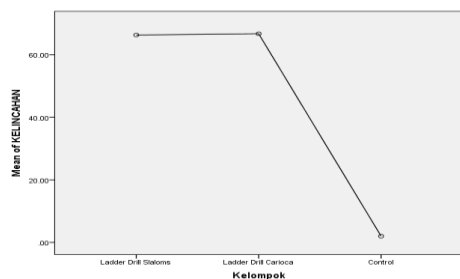


Figure 4. Means plots speed

From the picture above it can be interpreted that there are significant differences between the three groups. So from the picture above it can be concluded that the Carioca Ladder drill exercises are more optimal giving an increase in speed compared to other exercises.

From the picture above it can be interpreted that there is no significant difference between the two groups. So from the picture above, it can be concluded that the Ladoca drill ladder drill and Carioca ladder drill can provide an increase in agility. The statement is made clear in the mean plots of agility.

4. CONCLUSION

Based on the results of the research and discussion explained in the previous chapter, it can be summarized the following research:

1. There is a significant effect on the Slaloms drill ladder exercise on speed and agility.
2. There is a significant influence on Carioca drill exercises on speed and agility.
3. re is a difference in effect between the Slaloms ladder drill and the Carioca ladder drill on increasing speed.

There was no difference in effect between the Slalom ladder drill and the Carioca ladder drill on increasing agility.

REFERENCES

Arjunan, R. (2015). Effect of Speed, Agility and Quickness (S. A. Q) Training on Selected Physical Fitness Variables Among School Soccer Players. *International Journal of Research in Humanities, Arts and Literature (IMPACT: IJRHAL)*. Vol. 3, Issue 10.

Atanasković, Andrija & Martin Georgiev. (2013). The Impact of Plyometric Training on the Explosive Power of the Lower Extremities of Handball Player. *Sport - Science & Practice*. Vol. 3, no.1.

Bompa, and Haff, G, (2009). *Theory and Methodology of Training*. United States : Human Kinetics.

Bompa, Tudor O & Carlo Buzzichelli. (2015). *Periodization Training for Sports*. Third Edition. United States : Human Kinetics.

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

Brown, Lee E., & Vance A. Ferrigno. (2005). *Training for Speed, Agility, and Quickness*. 2nd ed. United States: Human Kinetics.

Chandrakumar, N. & C. Ramesh. (2015). Effect of ladder drill and SAQ training on speed and agility among sports club badminton players. *International Journal of Applied Research*. 1(12): 527-529.

Dawes, Jay & Mark Roonzen. (2012). *Developing Agility and Quickness*. Australia: Human Kinetics.

Dhanaraj, S. (2014). Effects of Ladder Training on Selected Motor Fitness Variables Among Handball Players. *International Journal of Science Research*. Volume: 3.

Erčulj, Frane, Mitja Bračić, & Saša Jakovljević. (2011). The Level of Speed and Agility of Different Types of Elite Female Basketball Players. *Physical Education and Sport*. Vol. 9, No 3.

Fenanlampir Albertus dan Faruq Muhammad Muhyi. (2015). *Tes dan Pengukuran Dalam Olahraga*. Yogyakarta: CV. Andi Offset.

Gevat Cecilia, Halil Taskin, Fatma Arslan , Alin Larion, And George Stanculescu. (2012). *The Effects Of 8-Week Speed Training Program On The Acceleration Ability*

- And Maximum Speed Running At 11 Years Athletes. Romania: Ovidius University Of Constanta, Faculty Of Physical Education And Sport, Constanta.
- Haff, Gregory G., & N. Travis Triplett. (2016). *Essentials of Strength Training and Conditioning*. United States: Human Kinetics.
- 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*. Volume. 7 No.1 pp 26-30.
- Jovanovic Mario. (2011). Effects Of Speed,Agility,Quickness Training Method On Power Performance In Elite Soccer Players. *Journal Of Strength And Conditioning Research*.
- Kusnanik, N.W., Nasution, J., dan Hartono, S. (2011). *Dasar-dasar Fisiologi Olahraga*. Unesa: Unesa University Press.
- Kusnanik. N.W. (2016). Pengaruha Latihan SAQ dan Plyometric Pada Sprinter PRIMA Utama 2013. *Jurnal IPTEK Olahraga: Jakarta*
- Mahardika, I Made Sriundi. (2015). *Metodologi Penelitian*. Surabaya: Unesa University Press.
- Maksum, A. 2012. *Metodologi Penelitian dalam Olahraga*. Surabaya: Unesa University Press.
- Milanovic, Z., Sporis, G., Trajkovic, N., James, N., and Samija, K. (2013). Effect Of A 12 Week SAQ Training Programme On Agility With And Without The Ball Among Young Soccer Players. *Journal Of Sport Science And Medicine*. 12. pp. 97-103.
- Mylsudayu. A dan Kurniawan F. (2015). *Ilmu Kepeleatihan Dasar*. Bandung: Alfabet
- Nandalal Singh And Bhupinder Sing. (2016). Twelve Weeks Saq Equipment Training On Selected Motor Fitness Variables Among School Athletes. *Periodic Research: Vol.- V,Issue-I, August-2016*.
- Nurhasan, (2011). *Tips Praktis Menjaga Kebugaran Jasmani*. Geresik: Abil Pustaka.
- Prasad Rahul Kumar And Dhapola M. S. (2014). Effect Of Eight Weeks S.A.Q. Training Programme Onselected Physical Fitness Variables. *International Multidisciplinary Research Journal Vol. 3 Issue 7 ISSN No. 2231-5063*.
- Raghuram, R., & I. Devi Vara Prasad. (2016). Analysis of the Changes in Selected Speed and Power Parameters in Response to Assisted and Resisted Sprint Training among Male Sprinters. *International Journal of Recent Research and Applied Studies*. Volume 3, Issue 10.
- Rajendran, K. (2016). Effect of Ladder Training on Agility among College level Football Players. *International Journal of Recent Research and Applied Studies*. Volume 3, Issue 4 (23).
- Rajkumar, R., & K.Divya. (2016). Effect of SAQ Training on Selected Physical Responses Among College Men Students. *Indian Journal of Applied Research*. Volume:6, Issue:8.
- Roesdiyanto & Budiwanto, S. (2008). *Dasar-dasar kepelatihan Olahraga*. Malang: Laboratorium Ilmu Keolahragaan Universitas Negeri Malang
- Syahrulniza, A. J. Nurjihan, A. Dan Lim, B. H. (2015). Effect of Ladder Drill Training on Agility Performance. *International Journal of Health Physical Education an Computer Science in Sport*. ISSN: 2231-3265, Volume 17 No. 1.pp 17-25
- Sethu, S. (2014). Comparison of Plyometric Training and Ladder Training on Sprinting Speed, Vertical Explosive Power and Agility. *International Journal of Recent Research and Applied Studies*. Volume 1,Issue 1(15).
- Sharma, Sandeep, & Mahesh Singh Dhapola. (2015). Effect of Speed, Agility Quickness (SAQ) Training Programme on Selected Physical Fitness Variables and Performance Ability in Basketball University Players. *International Educational E-Journal*. Volume-IV, Issue-III.
- Sugiono. (2015). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: alfabeta
- Sukadiyanto dan Muluk, D. 2011. *Pengantar Teori dan Metodologi Melatih Fisik*. Bandung: Lubuk Agung.
- Suresh, A. & S. Bevinson Perinbaraj. (2016). Effect of SAQ Training Associated with Speed Training on Agility Explosive Power and Speed among Engineering College Sports Persons. *International Journal of Recent Research and Applied Studies*. Volume 3, Issue 6 (12).
- Tsivkin, Troman. (2011). <http://www.sport-fitness-advisor.com>. di unduh tanggal 10 Agustus 2017.
- Unesa. (2015). *Buku Pedoman Program Pascasarjana Universitas Negeri Surabaya*. Surabaya: PPS Universitas Negeri Surabaya.
- Vallimurugan, V. and Vincent, J.P. (2012). Effect of SAQ Training On Selected Physical Fitness Parameters of Men Football Palyers. *International Journal of Advanted and Inovation Research*. Volume 1, Issue 2.
- Villanueva Alberto Mendez, Buchheit Martin, Kuitunen Sami, Douglas Andrew, Peltola Esa, & Bourdon Pitre. (2011). Age-related differences in acceleration, maximum running speed, and repeated-sprint performance in young soccer players. *Journal of Sports Sciences ISSN: 0264-0414*
- Winarno, M.E. (2011). *Metodologi Penelitian dalam Pendidikan Jasmani*. Malang: Media Cakrawala Utama Press.