Journal of Football Research
Publisher: Sekolah Tinggi Olahraga dan Kesehatan Bina Guna
Journal Homepage: https://jurnal.stokbinaguna.ac.id/index.php/Jofr
e-ISSN: 3047-0862

Aerobic Capacity Support for Anaerobic Alactasid Training (Speed Endurance) in Football: A Case Study of UPI Football UKM

Ibnu Daffa Al Fathir[1], Agus Rusdiana[2], Surdiniaty Ugelta[3], Iman Imanudin[4]
[1,2,3,4]Universitas Pendidikan Indonesia, Jawa Barat, Indonesia
Street Setiabudi No.229, Isola, Sukasari, Bandung, Jawa Barat, Indonesia

Received: 11-09-2024 Revised: 13-10-2024 Accepted: 27-10-2024

Abstract: Football in Indonesia has a weakness, namely their physical condition is less able to survive for 90 minutes in the game. This is closely related to the player's endurance. When a football player has good VO2max endurance, it will be very easy to maintain his performance in playing, unlike when a player does not have good endurance, it will affect his game, fatigue causes a decrease in performance in the match. The purpose of this study was to determine whether there is aerobic capacity support for anaerobic alactasid training (speed endurance) in football. The method used in this study is descriptive quantitative. The sampling used in this study was non-probability with a purposive sampling technique. Twenty UPI Football UKM students took part as participants in this study. There are 2 types of tests carried out, namely; (1) Aerobic Capacity Testing (VO2Max) with the Balke test research instrument, (2) 30 m short-distance running training with a total of 10 x maximum repetitions with a predetermined rest time. The data obtained from the test results were then analyzed using SPSS software version 23, namely using the normality test and correlation test. From the results of data processing, the Sig value of the relationship between the VO2Max variable and the Speed Endurance variable is 0.000, which means the Sig value <0.05 and the correlation value is 0.845. So it can be concluded that there is a very strong positive relationship between the VO2Max variable and Speed Endurance.

Keywords: Football; VO2Max; Speed Endurance

Correspondence author
Email: ibnudaffa@upi.edu

INTRODUCTION

Football is one of the most popular sports in the world, especially in Indonesia. Many children in Indonesia have dreams of becoming professional football players, for them football has a significant meaning in their own lives, many of them have talent in football but are constrained by various things, one of which is inadequate training facilities.

A good game requires mastery of football techniques, because technique is a supporter and a main foundation for someone in playing football. So to improve and increase the quality of a game towards achievement, problems in technique determine the game of football (Soniawan, 2018). Based on the components of the achievement sport, physical condition is a very important component for athlete performance. Likewise in football, every player must master the elements of physical condition. (Syarif Hidayat, 2014) explains that there are 5 components in physical condition, namely: Strength, Endurance, Speed, Flexibility and Coordination. According to the opinion above,

there are several components of physical condition that every player must master to become an accomplished football player. Physical condition is a requirement that must be possessed by an athlete in improving and developing optimal sports achievements, so that all physical conditions must be developed and improved according to the characteristics, characteristics, and needs of each sport. Football players are currently actively competing with each other to improve the quality of their performance in order to give their best performance in the match in order to achieve maximum achievement. According to (Fisik et al., n.d.) physical condition is a complete unity of components that cannot be separated, both in terms of improvement and maintenance. This means that in an effort to improve physical condition, all of these components must be developed. In addition, low physical activity can cause cardiorespiratory health problems in adolescents in the future such as shortness of breath, heart attacks, chest pain and strokes, where cardiorespiratory fitness can be useful for increasing insulin sensitivity, glucose transport, improving the nervous system and reducing heart rate (Lee DC, Artero EG, Sui X, 2010). Speed is a very important physical condition in the game of football (Syarif Hidayat, 2014) states that speed is the ability to cover a certain distance in the shortest possible time. In line with this opinion, speed in football is very influential, this can be seen when passing opponents either with or without the ball. Speed is used when players receive a pass or area ball from a teammate and interfere with opposing players when dribbling the ball at high speed, counterattacking or during transitions. High speed must be able to be practiced repeatedly so that it becomes speed endurance.

Speed endurance is a crucial factor in the world of football which faces high physical demands. Modern football matches often involve a combination of fast sprints, sudden changes of direction, and dynamic moving movements. Players who have good speed endurance have an advantage in maintaining their consistent performance throughout the match.

Aerobic capacity (VO2Max) is the greatest aerobic power capacity that a person has (Gumantan & Fahrizqi, 2020). Aerobic capacity (VO2Max) is the body's maximum capacity to distribute and use oxygen during intense exercise, which shows a person's level of physical fitness. Work on VOMax can only be maintained for a few minutes to maintain work for a long time. A soccer player who has good endurance will be able to maintain his performance while playing in a match. In addition, a player is also required to continue moving throughout the field, both when controlling or losing the ball, this aims to open up space or seize the ball so that his team can control the course of the game. So not only technical skills are needed to master the match, but also excellent and consistent physical endurance is needed during the match so that the player is able to explore every corner of the field optimally. Therefore, players are required to be able to explore the entire field area, it is very crucial in achieving victory in the match.

A successful training program to support aerobic capacity for speed endurance in soccer should include exercises that mimic real-world game conditions. For example, interval training that combines short sprints with recovery breaks can prepare players for the frequent changes in speed that occur in a match. In addition, speed and change-of-direction training can help improve speed endurance and players' responsiveness to dynamic game situations. Not only that, psychological aspects also play an important role in speed endurance. Players need to learn to manage mental stress and fatigue that can affect their work consistency. This involves developing mental toughness, focus, and the ability to make quick decisions. With a systematic approach, soccer players can achieve optimal speed endurance and can make a positive contribution to their performance on the field. From the background explanation above, the author intends to find out and

provide an understanding of the support of aerobic capacity (VO2max) for players of the Indonesian Education University Football Student Activity Unit in Speed Endurance training, with the aim of knowing the physical description of Indonesian Education University soccer players.

METHOD

The method used in this study is quantitative descriptive, descriptive research is a method that aims to explain in detail specific aspects of events that occur. The research method used is the comparative method. According to (Sugiyono, 2013) "The comparative research method is a study that compares the existence of one or more variables in two or different samples, or at different times". Data analysis in this study is quantitative statistics to test the established hypothesis, this method is carried out to determine the comparison of endurance levels (VO2Max) with speed abilities in soccer players.

Research participants are people who voluntarily participate in human subject research after giving their consent to become research subjects. Participants in this study were 20 active students of UKM Sepakbola Universitas Pendidikan Sepakbola. The criteria for participants were selected based on, Availability to participate in research and have a sense of responsibility, actively exercise, free from disease and injury.

Population is the group that researchers are interested in to generalize the results of the study. (Sugiyono, 2019) explains that population is a generalization area consisting of objects or subjects that have certain quantities and characteristics determined by researchers to be studied and then conclusions drawn. In this study, the population that the author chose was Active Students who were still involved in the Football Student Activity Unit of the Indonesian Education University.

(Sugiyono, 2019) the sample is part of the number and characteristics possessed by the population. The sampling procedure used in this study is non-probability with purposive sampling technique. So it can be concluded that the sample is a group where information will be obtained and part of the characteristics possessed by the population.

An instrument is a tool that meets academic requirements so that it can be used as a tool to measure an object of size to collect data on a variable, the instrument can also be a test and non-test. The instruments in this study were endurance tests (VO2MAX) and short-distance running tests (sprints) 30 M. While the tools needed are whistles, stationery, stopwatches and cones.

Balke test is one of the fitness tests designed by Bruno Balke, is one of the field tests designed to measure aerobic fitness. This test has a formula to predict VO2max from the distance run. The method is the athlete runs for 15 minutes, then the results of the distance achieved by the athlete while running during the 15 minutes are recorded (Sukadiyanto, 2011). This test is relatively easy to implement because it requires simple equipment, including

a. A 400 m running field or track that is clear or not too far away, meaning that the track can be seen clearly by the tester.
b. Distance markers or small flags to mark the distance of the track.
c. Stopwatch or time measuring device in minutes. The protocol for implementing the test is as follows;
d. Test participants stand on the starting line and assume the position to run as fast as possible for 15 minutes.
e. Simultaneously with the command "Yes" the test participant starts running with the timekeeper starting to "ON" the stopwatch.

f. During the 15 minutes, the tester gives the command to stop, at which time the stopwatch is turned off and the participant plants the flag that has been prepared as a marker for the distance he has traveled.
g. The tester measures the distance traveled by the test participant who has been traveled for 15 minutes, with a meter. Next, the results of the 15-minute running distance are entered into the following formula: VO2max = 33.3 + (Distance/15) – 133 x 0.172

Speed Endurance Running Test, Each athlete is given the opportunity to run a 30M test with 100% intensity at the beginning to find out their best time, then after the results are out, the next training is continued at 80% intensity with 10 repetitions of maximum repetitions, if the athlete is strong up to 10 repetitions, then the athlete is in very good performance and proves that high VO2Max will produce a good training process for speed endurance, so that later it will be known to what extent each of the UPI SOCCER UKM athletes can survive until the end or not by looking at the results of the data that is already known.

Research Procedure:

• Problem Formulation

Problem Formulation is to discuss the problems that exist around and will be studied by researchers, namely the effect of endurance support (VO2Max) on basic dribbling technique training in football.

• Population and Sample

The population in this study were UPI Soccer UKM students who participated in UPI Soccer UKM with a total of 20 people. While for the sample itself, 20 people were taken with the criteria of availability to participate in the study and having a sense of responsibility, actively exercising, free from injuries and acute illnesses, and not being elite athletes.

• Injury Concern

The next procedure is to convey information to the sample about the study to obtain approval before being carried out in the study.

• Treatment

Each sample will be given a treatment in the form of a balke test in the form of jogging for 15 minutes. Then basic soccer speed training is carried out as many as 7 sets.

• Data Analysis

After obtaining the required data, the data will be processed and analyzed through a computerized statistical comparison procedure to determine the results of the treatment.

• Conclusions and Suggestions

In the final stage, the researcher will provide a conclusion of the data obtained during the study and suggestions as a form of reference material for further research to make it clearer.

RESULT AND DISCUSSION

Result

Before entering into a more in-depth descriptive analysis, it is important to understand that this stage is designed to present an overview of the data obtained in this study. In Table 1, the variables that are the focus are VO2Max and Speed endurance.

Table 1. Research Data

NO	Run Test	VO2Max	100%	80%	Time	Rest	Total
1	3230	47,5	4,3	5,16	4,9 - 5,3	25,8	10X
2	3230	47,5	4,3	5,16	4,9 - 5,3	25,8	10X
3	3270	47,9	4,3	5,16	4,9 - 5,3	25,8	10X
4	3000	44,8	4,4	5,28	5,0 - 5,4	26,4	10X
5	3300	48,3	4,2	5,04	4,8 - 5,2	25,2	10X
6	3000	44,8	4,2	5,04	4,8 - 5,2	25,2	10X
7	2740	41,8	4,7	5,64	5,4 - 5,8	28,2	9X
8	3400	49,4	4,2	5,04	4,8 - 5,2	25,2	10X
9	3430	49,8	4,1	4,92	4,7 - 5,1	24,6	10X
10	1800	31	4,9	5,88	5,6 - 6,0	29,4	5X
11	3310	48,4	4,6	5,52	5,3 - 5,7	27,6	10X
12	2830	42,9	4,5	5,4	5,2 - 5,6	27	10X
13	2900	43,7	4,6	5,52	5,3 - 5,7	27,6	10X
14	3460	50,1	4,6	5,52	5,3 - 5,7	27,6	10X
15	3290	48,2	4,2	5,04	4,8 - 5,2	25,2	10X
16	2800	42,5	4,5	5,4	5,2 - 5,6	27	10X
17	2750	42	4,6	5,52	5,3 - 5,7	27,6	9X
18	2700	41,4	4,7	5,64	5,4 - 5,8	28,2	9X
19	2600	40,2	4,7	5,64	5,4 - 5,8	28,2	7X
20	2950	44,3	4,5	5,4	5,2 - 5,6	27	10X

Tabel 2. Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
VO2Max	20	31	50,1	897	44,83	4,5047
Speed Endurance	20	5	10	189	9,45	1,2763
Valid N (listwise)	20					

Based on table 1, it can be seen that the VO2Max variable has a minimum value of 31 and a maximum value of 50.10. With an average value of 44.8250 and a standard deviation value of 4.504. Based on table 1, it can be seen that the Speed Endurance variable has a minimum value of 4 and a maximum value of 10. With an average value of 9.45 and a standard deviation value of 1.276. Before entering further analysis, a normality test was carried out to evaluate the extent to which the data follows a normal distribution. Table 2 presents the results of the Shapiro-Wilk normality test for the VO2Max and Speed Endurance variables.

Tabel 3. Tests of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Result	vo2max	0,174	20	0,12	0,867	20	0,01
	Speed Endurance	0,417	20	0	0,508	20	0

a. Lilliefors Significance Correction

Based on table 4.2, it can be seen that the results of the Shapiro-Wilk normality test show that both variables, namely VO2Max and Speed Endurance, are not normally distributed at a significance level of 0.05. For the VO2Max variable, the Sig. value is 0.011, while for the Speed Endurance variable, the Sig. value is 0.000. Both Sig. values are smaller than alpha (0.05), so we reject the null hypothesis which states that the data is normally distributed. Thus, it can be concluded that the VO2Max and Speed Endurance data do not meet the assumptions of a normal distribution. The next step is to conduct a correlation analysis to explore the relationship between the VO2Max and Speed Endurance variables. Table 4.3 provides an overview of the correlation and its statistical significance.

Tabel 4. Correlations

		VO2Max	Speed Endurance
VO2Max	Pearson Correlation	1	,845**
	Sig. (2-tailed)		0
	N	20	20
Speed Endurance	Pearson Correlation	,845**	1
	Sig. (2-tailed)	0	
	N	20	20

**. Correlation is significant at the 0.01 level (2-tailed).

Based on table 4.3, it can be seen that the correlation value between the VO2Max variable and the Speed Endurance variable is 0.845, this means that the relationship between the VO2Max variable and Speed Endurance has a "Very Strong" relationship. Based on the Sig value of the relationship between the VO2Max variable and the Speed Endurance variable is 0.000 which means the Sig value <0.05. So it can be concluded that there is a positive relationship between the VO2Max variable and Speed Endurance.

Discussion

Based on the results of the data analysis, it is known that there is a significant correlation between the VO2Max variable and the Speed Endurance variable. This is indicated by a sig value smaller than 0.05. This means that if the VO2Max variable is higher, the Speed Endurance variable will also be higher.

Judging from the results of the correlation between the VO2Max and Speed Endurance variables, which reached a value of 0.845, it can be concluded that the relationship between the two is in the "Very Strong" category. This indicates that changes in VO2Max values are closely related to changes in Speed Endurance values, and vice versa. With a correlation value approaching 1, it can be interpreted that there is high consistency between the two variables, which can be explained as a consistent and predictable relationship pattern.

It can be observed that the results of the study showed a consistent increase in VO2Max and Speed Endurance of UPI Football UKM athletes, reflecting the positive impact of a well-planned training program. The very strong correlation between VO2Max and Speed Endurance indicates that increasing aerobic capacity can be a significant predictor of increasing the speed endurance of soccer athletes. These findings provide a basis for designing more focused and specific training programs, enriching the understanding of the complex relationship between aerobic capacity and speed endurance in the context of soccer.

CONCLUSION

Based on the results of the analysis and discussion of the relationship between VO2Max and Speed Endurance, the following conclusions can be drawn: The aerobic capacity (VO2Max) of UPI Football UKM athletes ranges from 31 to 50.10, with an average of 44.8250. This shows a variation in aerobic fitness levels among athletes. The repetition capacity of speed endurance training of UPI Football UKM athletes ranges from 4 to 10 times in one set, with an average of 9.45. These results reflect variations in speed endurance ability among athletes. There is a very strong positive relationship between aerobic capacity (VO2Max) and the repetition ability of speed endurance training of UPI Football UKM athletes with a correlation value of 0.845. This relationship is also statistically significant with a Sig value <0.05. From the results of the research that has been conducted to improve the quality of research, the author presents the following implications and recommendations: The author hopes that the findings of this study can provide benefits both theoretically and practically, not only for general readers but also for the author himself. This study acknowledges that there are areas that still need development, including in the discussion of endurance, basic soccer techniques, and dribbling skills. In addition, the arrangement of words is also acknowledged to still require support and assistance from various parties. The author suggests that further research can improve its quality by collecting information from more and more diverse reference sources. The increase in the number of samples in the study must also be increased, not only from UKM members. It is recommended to involve athletes from soccer clubs. Thus, further research is expected to be more in-depth and comprehensive in supporting the understanding of aerobic capacity support (VO2Max) for the speed endurance training process in soccer

ACKNOWLEDGEMENTS

Acknowledgments to UPI Football UKM athletes helped conduct research or who funded it.

CONFLICT OF INTEREST

Clearly explain whether there are any conflicts of interest related to the reported research.

REFERENCES

Abdillah, R., Risma, R., & Rofi, U. A. (2021). Kontribusi Daya Tahan Otot Fleksor Siku Dengan Ekstensor Bahu Terhadap Daya Tahan Otot Lengan Pada Siswa Ekstrakurikuler Bolabasket. Jurnal Keolahragaan, 7(2), 21. https://doi.org/10.25157/jkor.v7i2.5627

Akhmad, I. (2013). Dasar-Dasar Melatih Fisik Olahragawan. https://scholar.google.com/citations?user=bglxf6cAAAAJ&hl=en&oi=sra

Arifin, Z. (2019). Pengaruh Latihan Game Dan Sprint 50 Meter Terhadap Peningkatan Vo2Max Atlet Sepakbola Ssb Kakimas Dampit Kabupaten Malang Kelompok Umur 14-15. Jp.Jok (Jurnal Pendidikan Jasmani, Olahraga Dan Kesehatan), 3(1), 103–114. https://doi.org/10.33503/jp.jok.v3i1.561

Dikdik Z Sidik. (2010). Dasar dan Lanjutan. Prodi Pendidikan Kepelatihan. FPOK. UPI. Bandung. Dasar Dan Lanjutan. Prodi Pendidikan Kepelatihan. FPOK. UPI. Bandung.

Fisik, K., Sepakbola, P., Asyabab, K., & Kabupaten, D. I. (n.d.). Asyabab Di Kabupaten Sidoarjo Deni Setiawan Physical condition is a whole unit from components that cannot be separated off hand , whether the improvement or the maintenance .

Problem that proposed in this research is how the physical condition of footbal. 1–5.

Foroudi, P. (2019). Influence of brand signature, brand awareness, brand attitude, brand reputation on hotel industry's brand performance. International Journal of Hospitality Management, 76(May), 271–285. https://doi.org/10.1016/j.ijhm.2018.05.016

Gumantan, A., & Fahrizqi, E. B. (2020). Pengaruh Latihan Fartlek dan Cross Country Terhadap Vo2Max Atlet Futsal Universitas Teknokrat Indonesia.

Harsono. (1988). Coaching dan Aspek Aspek Psikologi Dalam Coaching.

Hidayat, R., & _ W. (2020). Pengaruh Metode Latihan Plyometrics terhadap Kecepatan Atlet Sepakbola SMA N 4 Sumbar FA. Jurnal Performa Olahraga, 5(1), 48–53. https://doi.org/10.24036/jpo139019

Hutama, V. A., & Yuliastrid, D. (2017). Hubungan Vo2Max Terhadap Pemulihan Denyut Nadi Setelah Latihan Submaksimal Pada Pemain Sepakbola Putra Kelompok Usia 18 Tahun El Faza Fc Surabaya. Jurnal Kesehatan Olahraga, 5(2), 71–78.

Hutter, K., Hautz, J., Dennhardt, S., & Füller, J. (2013). The impact of user interactions in social media on brand awareness and purchase intention: The case of MINI on Facebook. Journal of Product and Brand Management, 22(5), 342–351. https://doi.org/10.1108/JPBM-05-2013-0299

Ihsanti, F. N., & Haryoko, H. (2022). Survei Daya Tahan VO2max Peserta Ekstrakurikuler Bolavoli di Sekolah Menengah Pertama (SMP). Sport Science and Health, 2(12), 613–619. https://doi.org/10.17977/um062v2i122020p613-619

Imanudin, I. (2008). Ilmu Kepelatihan Olahraga.

Indrayana, B., & Yuliawan, E. (2019). Penyuluhan Pentingnya Peningkatan Vo2Max Guna Meningkatkan Kondisi Fisik Pemain Sepakbola Fortuna Fc Kecamatan Rantau Rasau. Jurnal Ilmiah Sport Coaching and Education, 3(1), 41–50. https://doi.org/10.21009/jsce.03105

Lee DC, Artero EG, Sui X, B. S. (2010). Mortality trends in the general population: the importance of cardiorespiratory fitness. J Psychopharmacol. https://doi.org/10.1177/1359786810382057

Lu, L. C., Chang, W. P., & Chang, H. H. (2014). Consumer attitudes toward blogger's sponsored recommendations and purchase intention: The effect of sponsorship type, product type, and brand awareness. Computers in Human Behavior, 34, 258–266. https://doi.org/10.1016/j.chb.2014.02.007

Luxbacher, & Joseph. (2012). Sepakbola / Luxbacher.

Mahfud, I., Yuliandra, R., & Gumantan, A. (2020). MODEL LATIHAN DRIBLING SEPAKBOLA UNTUK PEMULA USIA SMA. Sport Science & Education Journal, 1(2). https://ejurnal.teknokrat.ac.id/index.php/sport/issue/archive

Millah, H., & Priana, A. (2020). Pengembangan Penghitungan Kapasitas Volume Oksigen Maksimal (Vo2max) Menggunakan Tes Lari 2,4 KM Berbasis Aplikasi Android. Gelanggang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga (JPJO), 3(2), 156–169. https://doi.org/10.31539/jpjo.v3i2.1081

Nocenti, M. R., & Cizek, L. J. (1973). Influence of estrogen on renal function and water intake in male rabbits rendered polyuric-polydipsic by food deprivation. Endocrinology, 93(4), 925–931. https://doi.org/10.1210/endo-93-4-925

Oh, H. (2000). The Effect of Brand Class, Brand Awareness, and Price on Customer Value and Behavioral Intentions. Journal of Hospitality and Tourism Research, 24(2), 136–162. https://doi.org/10.1177/109634800002400202

Peningkatan Daya Tahan Kardiovaskuler Peserta Latihan Lari Jarak Jauh Fajar Ilmiyanto, T., & Budiwanto, S. (2017). Perbedaan Pengaruh antara Metode Latihan Fartlek dan Metode Latihan Continuous Tempo Running. Indonesia Performance Journal, 1(2), 1–7. http://journal2.um.ac.id/index.php/jko

Saputra, N. (2013). Pengaruh Kekuatan Otot Tungkai, Kecepatan Lari dan Ketepatan Tendangan Terhadap Hasil Tendangan Kearah Gawang Pada Klub Sepakbola Persilang Divisi II Liga Jepara.

Sasmita, R. A. (2015). Pengaruh Latihan Zig-Zag Run Terhadap Kecepatan Lari Pemain Futsal Pengaruh Latihan Zig-Zag Run Terhadap. Articel Journal, 1–14. scholar. (n.d.).

Schwarz, P., Body, J. J., Cáp, J., Hofbauer, L. C., Farouk, M., Gessl, A., Kuhn, J. M., Marcocci, C., Mattin, C., Muñoz Torres, M., Payer, J., Van De Ven, A., Yavropoulou, M., Selby, P., &)2014. (ح, فاطمی. No Title شیمی مواد غذایی. European Journal of Endocrinology, 171(6), 727–735. https://eje.bioscientifica.com/view/journals/eje/171/6/727.xml

Soniawan, V. (2018). Metode Bermain Berpengaruh Terhadap Kemampuan Long Passing Sepakbola. Jurnal Performa Olahraga, 3(01), 322214.

Subarkah, A. (n.d.). Pelatihan Kondisi Fisik Untuk Meningkatkan Pengetahuan Bagi Pelatih Cabang Olahraga Di Desa Gunung Picung Kecamatan Pamijahan Kabupaten Bogor Jawa Barat. In Prosiding Seminar Nasional Pengabdian kepada Masyarakat (Vol. 2020). http://journal.unj.ac.id/unj/index.php/snppm

Sugiyono. (2013). Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif dan R&D. Bandung : Alfabeta.

Sugiyono. (2017). Metode penelitian kuantitatif, kualitatif, dan R&D. ALFABETA.

Sugiyono. (2019). Metode penelitian kuantitatif kualitatif dan r&d. Bandung : Alfabeta.,

Sukadiyanto. (2011). Teori dan Metodologi Melatih Fisik. In Bandung: Lubuk Agung. Lubuk Agung : Bandung.

Supian, A. (2014). Kontribusi Kecepatan Lari dan Kelincahan Terhadap Kecepatan Dribbling Bolabasket Pada Pemain Basket Putra SMKN 3 Banjarbaru. Jurnal Multirateral, 13(1), 37–53.

Syarif Hidayat. (2014). Pelatihan Olahraga : Teori dan Metodologi / Syarif Hidayat.

Tinggi Badan, K., Badan, B., & Cepat, D. P. T. T. K. L. (2010). SPRINT) 100 METER PUTRA (Studi pada Mahasiswa IKOR Angkatan. universitas negeri makassar-digilib-unm-ruslan-348-1-7.rusla-c. (n.d.).

Warni, H., Arifin, R., & Bastian, R. A. (2017). Pengaruh Latihan Daya Tahan (Endurance) Terhadap Peningkatan Vo2Max Pemain Sepakbola. Multilateral Jurnal Pendidikan Jasmani Dan Olahraga, 16(2), 121–126. https://doi.org/10.20527/multilateral.v16i2.4248