



The Influence Of Speed, Agility, Quickness (SAQ) Exercise On Agility And Speed

Surawan^{1*}, Setyo Harmono², Budiman Agung Pratama³

^{1,2,3}Postgraduate Program / Nusantara PGRI Kediri University / East Java / Indonesia

^{1,2,3}Street. KH. Ahmad Dahlan No. 76, Mojoroto, District. Mojoroto, Kediri City, East Java, 64112

¹surawan901@gmail.com, ²setyo.harmono@unpkediri.ac.id, ³agung10@unpkediri.ac.id

Received: September 12, 2022; **Reviewed:** September 25, 2022; **Accepted:** October 2, 2022;
Published: October 28, 2022

ABSTRACT

The importance of agility and speed in football players in an effort to get maximum achievement and considering the type of Speed, Agility, Quickness (SAQ) training program, is a method that can be used to increase agility and speed, this study aims to determine the effect of speed, agility, quickness (SAQ) training on agility and speed in football extracurricular students of SMK PGRI 9 Ngawi Regency. This study uses a quantitative approach, the type of research is experimental research, the research design uses randomized control group pretest-posttest, the sample is 30 people, while agility data is collected using the Illinois agility test instrument and the 20-meter running test. The data analysis technique used is an independent sample t-test. The results showed that the sig value of $0.001 < 0.05$ which shows that there is an influence of speed, agility, quickness (saq) training on agility and speed in extracurricular football students of SMK PGRI 9 Ngawi Regency, This is seen from the average pre-test and posttest values of speed, agility, quickness (saq) training has a change of 2.71 to agility and 2.41 to speed, it can be concluded that the speed training method, Agility, Quickness (SAQ) is better for increasing agility.

Keywords: Speed; Agility; Quickness.

INTRODUCTION

Everyone's physical activity in living daily life in supporting a healthy life should be done with awareness (Bangun & Yunis, 2016) that it is part of exercise or physical exercise to increase physical freshness which is done happily (Hammado & Sahabuddin, 2019), without coercion and being part of one's life needs (Firmansyah, 2016). By exercising, the internal organs of the body will work so that it will make the body become physically and spiritually healthy (Faozi, 2016) and in addition at the same time can increase achievements in the field of sports (Lengkana & Sofa, 2017). Higher physical fitness can improve the appearance of sportsmen and reduce the likelihood of injury (Rokhayati et al., 2016). Existing experience shows that people who regularly do sports activities will get something valuable, this is health (Yuniartik et al., 2017). Therefore, to gain physical

fitness, humans are encouraged to do movement and exercise without any coercion from others (Taufan et al., 2018).

Football is one of the most popular sports in the world and has its own charm compared to other sports (Yuniartik et al., 2017). Indonesia is one of the countries with a very high demand for football, evidence of this can be seen from the large number of fans, professional-level clubs to football schools in the archipelago (Supriyanto et al., 2016). However, national football achievements have not been able to get maximum results (Bryantara, 2016). Many practitioners, football coaches are trying to design methods to curricula that are considered in accordance with the culture and philosophy of Indonesian football (Fatikhatus, 2020). The emergence of Filanesia or Indonesian Football Philosophy is considered as a representation of the characteristics and culture of Indonesian football itself (Erfayliana & Wati, 2020).

Football is a simple game and the secret of a good football game is to do simple things and do them in the best possible way (Santoso, 2014). As we know football is played two rounds, each round is played 45 minutes with a rest period of 15 minutes, 90 minutes the player must try to score and defend the goal from conceding (Rahmad, 2016), then the football player must have good aerobic capacity (Hutama & Yuliasrid, 2017), but nevertheless the energy system used by football players as a whole is the Oxygen system 30%, Lactic Acid-Oxygen 20% and ATP-PC and Lactic Acid 50% (Ferry & Welis, 2019).

Modern football games are fast games with the best possible use of time, so in the game of football agility is needed (Bryantara, 2016). Modern football is a very fast game, and it has a good wiggle room (Busyairi & Ray, 2018). Therefore, agility and agility are absolutely necessary for football players. In the game of football, agility is needed to change the direction of movement quickly (Burhanuddin et al., 2022) when looking for space to receive passes, pass opponents, and return quickly to their respective positions (Mulya & Millah, 2019). The characteristic of a fast and constantly moving football game (Hutajulu, 2016), a team that has better speed, makes more moves, will have more scoring opportunities, which will eventually win the game (Komarudin, 2021). Agility training is a form of exercise that is tailored so that a person is able to move quickly while changing direction without losing body balance. One of the causes of the lack of agility is the lack of variation in the exercises provided by teachers and trainers in increasing agility and also the ability to develop exercises from the students themselves that have not been maximized (Purwanto et al., 2021).

Training is the process of carrying out sports activities carried out based on a systematically compiled exercise program (Saleh, 2020), aiming to improve the ability of athletes in an effort to achieve the maximum possible achievements, especially carried out in preparation for a match (S. & Yulifri, 2019). Training is the process by which an athlete is prepared for the highest performance (Dany et al., 2016). The exercise aims to help coaches, coaches, sports teachers to be able to apply and have conceptual abilities as well as skills in helping to reveal the potential of sportsmen to reach the peak of achievement (Sahabuddin, 2017). The main goal and objective of training is to help athletes improve their skills and achievements as much as possible (Isaac et al., 2022). Exercise is a process that must be carried out continuously, progressively and continuously. Changes that occur in the human body due to exercise must be maintained properly so as not to experience a decrease in ability (Nugraha et al., 2021). From some of the opinions of such experts it can be concluded that exercise is the process of improving the ability of an athlete to achieve the maximum possible achievements. One of the training methods to increase agility is SAQ or speed, agility, quickness. speed, agility and quickness (SAQ) training program.

In its implementation, an athlete to achieve maximum physical condition a coach makes a good training program and training method (Imron & Wismanadi, 2022), so that the effectiveness of training and training goals can be achieved properly. The exercise methods used in this modern era, in their development are very different from some of the old practice methods (Ihsan et al., 2021). In this modern era, there are variations in training methods and the use of exercise tools in carrying out a set of exercises, this opinion is strengthened by the existence of the High Intensity Interval Training (HIIT) and (Speed, Agility, and Quickness SAQ) methods (Fauzi et al, 2020).

Speed, Agility and Quickness (SAQ) is a training method aimed at developing motor skills and control of body movements through the development of the neuromuscular system. It aims to improve the ability of athletes to perform multidirectional movement explosive power by reprogramming the neuromuscular system, so that it can work more efficiently (Vallimurugan, 2012).

Improving the physical condition component is very necessary in every sport in improving achievements (Sudirman et al., 2022). Agility is one of the components of physical condition that is very important in the sport of football. So that with good agility athletes can easily play the game of football and can achieve achievements (Hendrayana, 2011). With this research, it is hoped that it will be an evaluation material for coaches in

providing models and forms of training to their athletes. strength performance in football players will improve after 8 weeks of the planned SAQ program. This study was conducted during the in-season for only 1 purpose, namely to see if power performance can be improved during the in-season period using the SAQ training method (Jovanovic et,al 2011).

Speed, agility and quickness (SAQ) training has become a popular way to train athletes. This exercise covers the entire spectrum of exercise intensity, from low intensity to high intensity. Every athlete has a different level. Therefore, the intensity of exercise should correspond to individual abilities. Speed, agility and quickness (SAQ) exercises are training systems aimed at the development of motor abilities and control of body movements through the development of the neuromuscular system. According to Sirajudin et al (2018) argue that to increase the speed and agility of players in attack and defense, one of them is SAQ (Speed, Agility, Quickness) training. SAQ (Speed, Agility, Quickness) training is a form of training variation with the aim of increasing speed and agility.

(Lee E, Brown and Vance A, 2005) defines speed, agility and quickness (SAQ) training as progressive training that leads to the development of key motion abilities to improve a player's or athlete's ability to better (faster) on the skills he has. According to (Milanović et al., 2013), speed, agility and quickness (SAQ) training is a training that will allow athletes to exert maximum strength so that their movement patterns are controlled and balanced, especially in sports.

Speed, agility, and quickness (SAQ) training is one of the training methods suggested by sports scientists and researchers in an effort to increase the speed of athletes. This can be seen from the results of previous research. According to (Latip & Isyani, 2020), speed, agility and quickness (SAQ) is an exercise method for the development of motor skills and control of body movements through the development of the berler nevromes system. Speed, agility and quickness (SAQ) training aims to improve athletes' ability to perform multidirectional explosive movements by reprogramming berler's nevromes system to work effectively in training.

The speed, agility and quickness (SAQ) training program group showed improvements in speed and agility. Performance on speed and agility of the speed, agility and quickness (SAQ) training group (Basri and Firdaus, 2020). Improvement of the physical condition component is indispensable in every sport in improving performance. Agility is one of the components of physical condition that is very important in the sport

of football. So that with good agility athletes can easily play the game of football and can achieve maximum achievements.

Based on the initial agility test using the illinois test conducted by researchers to 30 football extracurricular students at SMK PGRI 9 Ngawi, using the illinois test conducted by researchers to 30 football players, presented in table 1.1 the results are as follows:

Table 1.
 Agility test results using football player *illions test*

No.	Needs Improvment	Fair	Good	Very Good	Excellent
Number of Respondents	21	7	2	0	0
Percentage	70%	23%	6%	0%	0%

Thus, it can be interpreted that the level of agility of football extracurricular students of SMK PGRI 9 Ngawi is still low and the need for training that can increase the agility of football extracurricular students of SMK PGRI 9 Ngawi is still low and there is a need for training that can increase the agility and speed of football players.

Based on the exposure to the problems that have been stated, an exercise is needed that can improve the ability of football players, especially in the agility component. The average participant has poor agility. Most learners are unable to *dribble* quickly when trying to get past an opponent, immediately moving quickly and making movements that are so slow. The lack of physical condition, especially on agility, has a huge impact on when doing the actual game.

METHOD

In this study using a quantitative approach, the quantitative approach in research is characterized by hypothesis testing and the use of standard test instruments (Maksum, 2012). Quantitative research methods can be interpreted as research methods based on the philosophy of positivism, used to research in certain populations or groups, data collection using research instruments, data analysis is quantitative / statistical with the aim of testing predetermined hypotheses.

The research technique used in this study is experimental, experimental research can be interpreted as a research method used to find the influence of certain treatments on others under controlled conditions. In this study, there were two groups that were randomly selected, then each group was given a preliminary test to find out the initial state before being treated. Furthermore, at the end of the treatment, the final test (posttest) is

carried out. So the design in this study is "rondomized control group pretest-posttest" (Maksum, 2012). The design of the study can be seen in table 2.

Table 2.
 Research design rondomized control group pretest-posttest

Sampling Techniques	Group	Pretest	Treatment	Posttest
Random	Agility	P01	X1	P1
	Speed	P02	X2	P2

The research site was carried out in the field of SMK PGRI 9 Kabupate Ngawi in JL. Raya Ketanggung, Perhutani Area, Ketanggung, Ketanggung, Sine, Ngawi, Ngawi Regency, the research place was chosen because the field is a training ground for Men's Football players of SMK PGRI 9 Ngawi Regency. The population in this study was 45 football extracurricular students. Thisresearch uses a sample of 30 players selected using random techniques. The *random* sampling technique is a sampling technique that provides equal opportunities for individuals who are members of the population to be selected as sample members. The random technique can be done by drawing lots or by random numbers. Test results are recorded with the optimal ability of the athlete or player on the results he has taken, the last result obtained by the athlete or player. In this study collected using observation techniques, documentation and, tests and measurements, the tests carried out are several kinds of test items related to the variables already mentioned. The data collection technique on each variable is to use the *Illinois Aggility Run Test* and 20-meter run. Hypothesis Test uses a t test using the help of the SPSS 22.0 computer program, which is by comparing the average values between three groups. The significant rate used is 95%. If the value of t count is smaller than t of the table then Ha is rejected, and if t count is greater than t of the table then Ha is accepted. From the data that has been obtained, it is continued by analyzing using Anova. Anova is used because it tests between two or more data groups. Anova stands for *Analysis Of Variance* which is designed to simultaneously test the differences of dependent variables. For such purposes, a widely used form of hypothesis testing is Wilks'λ. If the results of Wilks'λ analysis show significant differences, then the analysis is continued by looking at the combination of differences between groups (Ali Maksum, 2012).

RESULTS AND DISCUSSION

The description of the results of this study discusses the average, standard deviation, variance, maximum and minimum values, as well as the average increase obtained from

the results of the pliometric exercise test given to each group. The test results will be recorded and calculated based on the group and type of exercise given. Here will be analyzed the results of the three groups based on research data using the *SPSS 22 For Windows* program, then the description of the research data can be further described in the form of a table as follows:

Table 3.
Group agility

	Agility score		
	<i>Pre-test</i>	<i>Post-test</i>	Different
Mean	18,13	15,42	-2,71
Standard Deviation	0,49	0,58	-0,09
Maximum	17,11	19,21	-2,1
Minimum	14,11	16,31	-2,2

Table 4.
Speed group

	Speed score		
	<i>Pre-test</i>	<i>Post-test</i>	Different
Mean	14,91	12,49	-2,42
Standard Deviation	0,84	0,93	-0,09
Maximum	16,12	14,20	1,92
Minimum	13,01	11,01	2

The magnitude of the difference in the agility and speed of the limb muscles in each group can be described in the following histogram form:

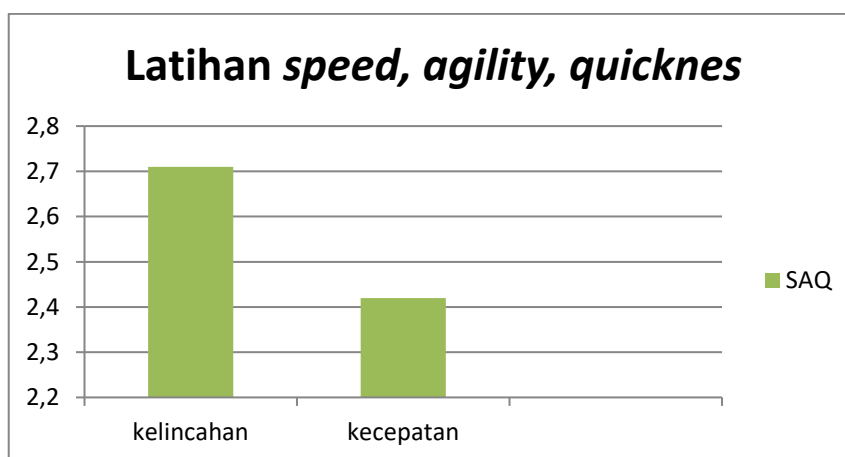


Figure 1.
Histogram of agility and speed

The normality test in this study was used to test the data obtained whether the data were normally distributed or not, carried out using the Kolmogorove-Semirnov test. The basis of the analysis used in making decisions is Asymp. Sig (2-tailed) > from 0.05 then the

data can be said to be normally distributed. Based on the results of the normality test using SPSS 22 for Windows, the following results were obtained:

Table 5.
 Normality test using *One-Sample Kolmogorov-Smirnov Test*

	Pre-test Agility	Post-test Agility	Pre-test Speed	Post-test Speed
N	15	15	15	15
Kolmogorov-Smirnov Z	.784	.906	.885	.928
Asymp. Sig. (2-tailed)	.002	.199	.056	.259

Based on table 5 of the normality tests of the three groups shows that the magnitude of the Asymp value. The sig (2-tailed) of the three groups is greater than 0.05. It can be said that the distribution of data from both groups of both pre-test and post-test data from the entire population is normally distributed. So that it can be used to analyze research results.

The homogeneity test is useful for testing the usefulness of the sample, which is uniform or not a variant of the sample taken from the population. The homogeneity test used in this study used Levene Statistics. The homogeneity test is used to determine whether or not the variation of samples taken from the same population is uniform. To calculate the homogeneity test, use the SPSS 22.0 program. The following are the results of the homogeneity test obtained:

Table 6.
 Homogeneity Test Table

Test of Homogeneity of Variances			Information
Variable dependents: SAQ	Levene Statistics	Sig.	
Group			
Agility	3.495	.072	Homogeneous
Speed			

From the table of homogeneity test results above, it can be seen that the *statistical levance* value is 3.495 and *the Sig* value. ($p = 0.072$) because of the value of *Sig.* ($p = 0.072 > 0.05$) according to the decision-making criteria, it can be said that the distribution of data from all three groups has the same (homogeneous) variants. Therefore, for the purposes of the test, the average difference between groups is taken from the *Equal variances Asssum value*, because the data obtained are homogeneous.

To answer the hypothesis that has been proposed, the analytical test used in this study is the average difference test (*mean difference test*) using the t-test analysis (*Paired t-test*). The values used in calculating the t-test (Paired t-test) are the pre-test and post-test

values of each group, with the presentation of the data, the results of the t-test *calculation* (*Paired t-test*) are as follows:

Table 7.
 Test the Difference in Average Paired Samples

Speed, Agility, Quickness		Mean	Mean Differences	t	Df	Sig (2-tailed)
Agility	Post-test	18,13	-2,71	12,696	14	,000
	Pre-test	15,42				
Speed	Post-test	14,91	-2,42	18,830	14	,000
	Pre-test	12,49				

Based on the table above, the t-test has the following pretest and posttest agility values. The test data results obtained a t-count value of 12.696 and for the t-table obtained 2.144, and a significance value of $0.000 < 0.05$, then this result showed that there was a significant difference. Because the t-count is larger than the t-table, so H_0 was rejected, thus meaning that it reads "There is an increase in speed, agility, quickness (SAQ) training towards increased agility in extracurricular football players of SMK PGRI 9 Ngawi district. The magnitude of the increase in agility can be seen from the average difference data of -2.71 seconds.

Based on the table above, the t-test has pretest and posttest values of speed, agility, quickness (SAQ) training against speed increases as follows. The test data results obtained a t-count value of 18.830 and for the t-table obtained 2.144, and a significance value of $0.001 < 0.05$, then this result showed that there was a significant difference. Because the t-count is larger than the t-table, so H_0 was rejected, thus meaning that it reads "There is an increase in speed, agility, quickness (SAQ) training towards the increase in speed in extracurricular football players of SMK PGRI 9 Ngawi district. The magnitude of the speed increase can be seen from the average difference data of -2.41 seconds.

Discussion

Improved speed, agility, quickness (SAQ) training on agility

Physical condition is an indispensable prerequisite in an effort to improve the achievements of an athlete, it can even be said to be a basic necessity that cannot be delayed or bargained anymore (Sajoto, 1995). Most sports always require good agility, especially in football players. Harsono (1988) argues that "agility demands not only speed, but also good flexibility of the joints of the limbs". According to Budiwanto (2012), "agility is the ability of an athlete to react to stimuli, be able to *start* quickly and efficiently, move correctly, always be ready to change or stop quickly to play quickly, gently, effectively, and

can do repeatedly". Amiq (2014:21) states that agility is a person's ability to change positions in a certain arena. According to Wiarto (2013), "agility is the ability of a person to be able to change direction quickly and precisely at the time of moving without losing balance". Meanwhile, according to Sajoto (1988), "agility is the ability to change direction quickly and precisely, while the body moves from one place to another. Agility skills are beneficial for football players such as making attacks to avoid opponents, pressure or tackles, and for defenders to reduce space on the field or field to limit movement attacks, or potentially achieve victory. From some of the opinions of such experts it can be concluded that agility is the ability of a person to be able to change direction quickly and precisely at the time of moving without losing balance. This is also shown in the test results, based on the table above, the t-test has pretest and *posttest plyometric depth jump* values as follows. The test data results obtained a t-count value of 12.696 and for the t-table obtained 2.44, and the significance value was $0.000 < 0.05$, then this result showed that there was a significant difference.

Based on previous research conducted by Hasan and Firdaus (2020) on "*Speed, Agility And Quickness (SAQ) Training to Increase Agility in Puslatcab Futsal Athletes in 2020*". Thus, it can be concluded that after six years of treatment with the speed, agility and quickness (SAQ) training program, it can have an impact on increasing agility.

Increased speed, agility, quickness (SAQ) training to speed power

In its implementation, an athlete to achieve maximum physical condition a coach makes a good training program and training method, so that the effectiveness of training and training goals can be achieved properly. The exercise methods used in this modern era, in their development are very different from some old practice methods. In this modern era, there are variations in training methods and the use of exercise tools in carrying out a set of exercises, this opinion is strengthened by the existence of the High Intensity Interval Training (HIIT) and (*Speed, Agility, and Quickness SAQ*) methods (Fauzi et al, 2020). Sprint refers to the full maximum speed a player can perform in running. In football you have to cover a lot of dirt on the field, so making sure you can do it quickly and efficiently should be an important part of speed training to increase agility. Speed or Speed is fast work that includes emphasizing the activity in the shortest possible time. That the increase in speed is the subject of all influencing factors, especially the engineering aspect and psychological factors. The principle of speed training is essentially to avoid the development of lactic acid deposits, namely by providing sufficient recovery between repetitions. In addition, speed

training should end immediately when there is a change in technique due to running out of *energy*. Agility is the ability to change the direction or position of the body quickly and carry out other movements. Sukadiyanto (2011) states that, "speed is the ability of a muscle or group of muscles to answer excitatory in the fastest (shortest) time possible". Speed as a result of a combination of the length of the swing of the limbs and the number of steps. According to Sajoto (1988), "speed is the ability to cover a certain distance, especially a short distance, in the shortest possible time". Amiq (2014) states that speed is a person's ability to work on continuous movement in the same form in the shortest possible time as in sprinting, punching in boxing, bicycle racing, archery, and others. According to Bompa (1994), "speed is the ability to cover long distances quickly. The ability to move quickly in a straight line is an integral component of success in various sports". This is also shown in the test results, based on the table above, the t-test has *pretest* and *posttest* values for *Speed, Agility And Quickness (SAQ)* training exercises for speed. The test data results obtained a t-count value of 18.830 and for the t-table obtained 2.144, and a significance value of $0.001 < 0.05$, then this result showed that there was a significant difference.

From the previous research conducted by Fauzi et al (2020) entitled "The Effect of Hiit And Saq Training on Agility and Speed". The results show that the implementation of research on High Intensity Interval Training (HIIT) and speed, *agility and quickness (SAQ)* training methods can increase agility and speed.

The difference in results between agility and speed from one method of training is *speed, agility, quickness (SAQ)*.

In this modern era, there are variations in training methods and the use of exercise tools in carrying out a set of exercises, this opinion is strengthened by the existence of the High Intensity Interval Training (HIIT) and (*Speed, Agility, and Quickness SAQ*) methods (Fauzi et al, 2020). Agility demands not only speed, but also good flexibility of the joints of the limbs". According to Foran in Budiwanto (2012), "agility is the ability of an athlete to react to stimuli, be able to *start* quickly and efficiently, move correctly, always be ready to change or stop quickly to play quickly, gently, effectively, and can do repeatedly". Amiq (2014) states that agility is a person's ability to change positions in a certain arena. According to Wiarto (2013), "agility is the ability of a person to be able to change direction quickly and precisely at the time of moving without losing balance". Meanwhile, according to Sajoto (1988), "agility is the ability to change direction quickly and precisely, while the body moves from one place to another. Agility skills are beneficial for football players such as making attacks to avoid opponents, pressure or tackles, and for defenders to reduce

space on the field or field to limit movement attacks, or potentially achieve victory. From some of the opinions of such experts it can be concluded that agility is the ability of a person to be able to change direction quickly and precisely at the time of moving without losing balance.

Whereas speed is the ability of a muscle or group of muscles to answer excitatory in the fastest (shortest) time possible". Speed as a result of a combination of the length of the swing of the limbs and the number of steps. According to Sajoto (1988:54), "speed is the ability to cover a certain distance, especially a short distance, in the shortest possible time". Amiq (2014) states that speed is a person's ability to work on continuous movement in the same form in the shortest possible time as in sprinting, punching in boxing, bicycle racing, archery, and others. According to Bompa (1994), "speed is the ability to cover long distances quickly. The ability to move quickly in a straight line is an integral component of success in various sports".

Based on the table above, the t-test has *pretest* and *posttest* values of *speed*, *agility*, *quickness* (SAQ) training against speed increases as follows. The test data results obtained a t-count value of 18.830 and for the t-table obtained 2.144, and a significance value of $0.001 < 0.05$, then this result showed that there was a significant difference. Because the t-count is larger than the t-table, so H_0 was rejected, thus meaning that it reads "There is an increase in speed, *agility*, *quickness* (SAQ) training towards the increase in speed in extracurricular football players of SMK PGRI 9 Ngawi district. The magnitude of the speed increase can be seen from the average difference data of -2.41 seconds.

CONCLUSIONS AND SUGGESTIONS

The results of research on the effect of speed, agility, *quickness* (SAQ) training on agility and speed can be concluded as follows: (1) There is a significant effect of *speed*, *agility*, *quickness* (SAQ) training on agility, this is based on a t test that states a calculated t value of $12.696 > t_{table} 2.144$, and a signification value of $0.001 < 0.05$; (2) There is a significant effect of *speed*, *agility*, *quickness* (SAQ) training on speed, this is based on a t test that states a calculated t value of $18,830 > t_{table}$ of 2.144, and a signification value of $0.001 < 0.05$; and (3) Speed, agility, *quickness* (SAQ) training is deeper in increasing the agility of football players, this is seen from the average *pre-test* and *post-test* of the two variables.

REFERENCES

- Amiq, F. (2016). *Sepakbola Sejarah Teknik Dasar Persiapan Fisik Strategi Dan Peraturan Permainan*. Malang: Universitas Negeri Malang.
- Bangun, & Yunis, S. (2016). Peran Pendidikan Jasmani Dan Olahraga Pada Lembaga Pendidikan di Indonesia. *Publikasi Pendidikan*, 6(3). <https://doi.org/10.26858/publikan.v6i3.2270>
- Bryantara, O. F. (2016). Faktor Yang Berhubungan Dengan Kebugaran Jasmani (VO2 Maks) Atlet Sepakbola. *Jurnal Berkala Epidemiologi*, 4(2), 237–249. <https://doi.org/http://dx.doi.org/10.20473/jbe.V4I22016.237-249>
- Budiwanto, S. 2012. *Metodologi Kepelatihan Olahraga*. Malang: UM Press.
- Burhanuddin, S., Syahrudin, S., Sahabuddin, S., & Majang, M. (2022). Pendekatan Saitifik Model Pembelajaran Kooperatif Untuk Meningkatkan Hasil Belajar Menggiring Bola. *Jambura Journal of Sports Coaching*, 4(2), 88–102. <https://doi.org/10.37311/jjsc.v4i2.15499>
- Busyairi, B., & Ray, H. R. D. (2018). Perbandingan Metode Interval Training dan Continuous Run terhadap Peningkatan Vo2max. *Jurnal Terapan Ilmu Keolahragaan*, 3(1), 76–81. <https://doi.org/10.17509/jtikor.v3i1.10128>
- Dany, M. M., Hariyanto, E., & Hariyoko. (2016). Pengaruh Kombinasi Latihan Power Tungkal Terhadap Peningkatan Ketrampilan Passing bagi Peserta Kegiatan Ekstrakurikuler Sepak bola SMPN 21 Malang. *Jurnal Pendidikan Jasmani*, 26(1). <https://doi.org/dx.doi.org/10.17977/pj.v26i1.7722>
- Erfayliana, Y., & Wati, O. K. (2020). Tingkat Keterampilan Dasar Bermain Sepakbola Peserta Didik Kelas Atas Sekolah Dasar. *TERAMPIL: Jurnal Pendidikan Dan Pembelajaran Dasar*, 7(2), 159–166. <http://ejournal.radenintan.ac.id/index.php/terampil/article/view/8119>
- Faozi, A. (2016). *Peningkatan Hasil Belajar Memukul Bola Kasti Melalui Permainan Drop Ball*.
- Fauzi, M., Wiriawan, O., & Khamidi, A. (2020). Pengaruh Latihan Hiit Dan Saq Terhadap Kelincahan Dan Kecepatan. *Multilateral: Jurnal Pendidikan Jasmani dan Olahraga*, 19(2), 146-153.
- Fauzi, M., Wiriawan, O., & Khamidi, A. (2020). Pengaruh latihan hiit dan saq terhadap kelincahan dan kecepatan. *Multilateral: Jurnal Pendidikan Jasmani dan Olahraga*, 19(2), 146-153.
- Fatikhatun. (2020). Pengembangan Keterampilan Gerak Dasar Permainan Sepakbola Melalui Penggunaan Bola Plastik. *Dinamika: Jurnal Praktik Penelitian Tindakan*, 10(3), 131–139. <https://doi.org/https://doi.org/10.47403/dp.v10i3.33>
- Ferry, M. W., & Welis, W. (2019). Hubungan Kadar Hemoglobin Terhadap Kemampuan VO2 Max Pada Pemain Sekolah Sepkabola (SSB) Tunas Inti Kecamatan Sungai

- Bungkal Kota Sungai Penuh. *Jurnal Stamina, Jurusan Kesehatan Dan Rekreasi Fakultas Ilmu Keolahragaan Universitas Negeri Padang*, 2(1), 425–436.
<https://doi.org/https://doi.org/10.24036/jst.v2i1.77>
- Firmansyah. (2016). Penerapan teori pembelajaran kognitif dalam pembelajaran pendidikan jasmani dan kesehatan. *Jurnal Pendidikan Olahraga (JPO)*, 5(2), 154–164.
<https://doi.org/https://doi.org/10.31571/jpo.v5i2.383>
- Hammado, N., & Sahabuddin. (2019). PKM senam otak pada Siswa Sekolah Dasar Negeri Kompleks IKIP 1 Makassar. In *PROSIDING, Seminar Nasional Pengabdian Kepada Masyarakat* (Vol. 1, Issue 1).
<https://ojs.unm.ac.id/semnaslpm/article/view/10877>
- Harsono. 1988. *Coaching dan Aspek-Aspek Psikologis dalam Coaching*. Jakarta: Departemen Pendidikan dan Kebudayaan, Direktorat Jenderal Pendidikan Tinggi.
- Hendrayana, Y. (2011). Keterampilan Sepakbola Studi Korelasional Antara Persepsi Kinestetik, Adaptasi Dan Kelincahan Dengan Keterampilan Sepakbola Siswa Siswa Sekolah Sepakbola Di Kota Bandung. *KETERAMPILAN SEPAKBOLA Studi Korelasional Antara Persepsi Kinestetik, Adaptasi Dan Kelincahan Dengan Keterampilan Sepakbola Siswa-Siswa Sekolah Sepakbola Di Kota Bandung*, 416(18), 17–30.
<https://ejournal.upi.edu/index.php/manajerial/article/view/1809>
- Hutajulu, P. T. (2016). Pengaruh Latihan High Interval Intensity Training Dalam Meningkatkan Nilai Volume Oksigen Maksimum Atlet Sepakbola Junior (U-18). *Artikel Skripsi*, 3(1), 1–10.
<https://ejournal.undiksha.ac.id/index.php/PENJAKORA/article/view/11664>
- Hutama, V. A., & Yuliasrid, 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), 71–79.
<https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-kesehatan-olahraga/article/view/22021/>
- Ihsan, H. R., Syamsuramel, & Victorian, A. R. (2021). Pengaruh Latihan Sirkuit Terhadap Kemampuan Dribble Dalam Permainan Sepakbola Pada SSB Putera Sukma U-15 Palembang. *Dribble Dalam Permainan Sepak Bola Pada Ssb Putera Sukma U-15 Palembang*, 4(2), 1–9.
<https://ojs.uniska-bjm.ac.id/index.php/riyadhohjurnal/article/view/5605>
- Imron, M., & Wismanadi, H. (2022). Perbedaan Efektivitas Latihan Lari Zig-Zag Dan Shuttle Run Terhadap Kelincahan Pemain Futsal. *Jurnal Kesehatan Olahraga*, 10(2), 137–144.
<https://ejournal.unesa.ac.id/index.php/jurnal-kesehatan-olahraga/article/view/45628>
- Ishak, M., Asmawi, M., Tangkudung, J., Dlis, F., & Sahabuddin. (2022). Smash Training Model in Badminton Game in College Students of the Faculty of Sports Science, Makassar State University. *International Journal of Science and Society*, 4(2), 209–221.
<https://doi.org/10.54783/ijssoc.v4i2.463>

- Jovanovic, M., Sporis, G., Omrcen, D., & Fiorentini, F. (2011). Effects of speed, agility, quickness training method on power performance in elite soccer players. *The Journal of Strength & Conditioning Research*, 25(5), 1285-1292.
- Komarudin, K. (2021). Latihan plyometric dalam sepakbola untuk anak usia muda. *Sepakbola*, 1(1), 67-77.
<http://ejournal.ressi.id/index.php/sepakbola/article/view/101>
- Latip, P., & Isyani. 2020. *Pengaruh Latihan SAQ Terhadap Kecepatan Dan Kelincahan Pada Siswa Ekstrakurikuler Futsal SMKN 2 Selong Tahun Pelajaran 2019 / 2020*. SPORTIVE: Journal of Physical Education, Sport and Recreation.
- Lee E, Brown. Vance A, F. 2005. *Book Training for Speed Agility and Quickness (2nd ed.)*. United States of America: Human Kinetics
- Lengkana, A. S., & Sofa, N. S. N. (2017). Kebijakan Pendidikan Jasmani dalam Pendidikan. *Jurnal Olahraga*, 3(1), 1-12.
<https://doi.org/https://doi.org/10.37742/jo.v3i1.67>
- Maksum, Ali. 2012. *Metode Penelitian Dalam Olahraga*. Surabaya: Unesa University Press.
- Mulya, G., & Millah, H. (2019). Pengaruh Latihan Ladder Drill Terhadap Peningkatan Kelincahan Pemain Sepakbola. *Jurnal Segar*, 8(1), 1-10.
<https://doi.org/doi.org/10.21009/segar/0801.01>
- Nugraha, K. A., Maryati, S., & Rustiawan, H. (2021). Dampak Latihan 40-Yard Sprint dan 40-yard Lateral Shuffle Terhadap Kelincahan Siswa Ekstrakurikuler Futsal. *Jurnal Keolahragaan*, 7(2), 1-11. <https://jurnal.unigal.ac.id/index.php/JKP>
- Purwanto, H., Pratama, B. A., & Atrup, A. (2021). Contribution of Motor Educability, Coordination, and Confidence to the Ability to Perform Flic-Flac Artistic Gymnastics Extracurricular at SDN Kayen I *COMPETITOR: Jurnal Pendidikan ...*, 13(3), 420-441. <https://ojs.unm.ac.id/competitor/article/view/24768>
- Rahmad, H. A. (2016). Pengaruh Penerapan Daya Tahan Kardiovaskuler (VO2 Max) Dalam Permainan Sepakbola PS Bina Utama. *Jurnal Curricula, Lembaga Layanan Pendidikan Tinggi (LLDIKTI) Wilayah X*, 1(2), 1-10.
<https://doi.org/http://doi.org/10.22216/jcc.2016.v1i2.1009>
- Rokhayati, A., Nur, L., Elan, & Gandana, G. (2016). Implementasi Pendekatan Taktis dalam Pembelajaran Pendidikan Jasmani Terhadap Motivasi, Kebugaran Jasmani dan Kemampuan Motorik. *Jurnal Pendidikan Jasmani Dan Olahraga*, 1(2), 57.
<https://doi.org/10.17509/jpjo.v1i2.5664>
- S., M. E. D. F., & Yulifri. (2019). Tinjauan Kondisi Fisik Pemain Sepakbola SMP Negeri 27 Padang. *JPO: Jurnal Pendidikan Dan Olahraga*, 2(6), 389-394.
<http://jpdo.ppj.unp.ac.id/index.php/jpdo/article/view/566>
- Sahabuddin. (2017). Evaluation Program Regional Training Center (Pelatda) PON XIX South Sulawesi. *JIPES, Journal of Indonesian Physical Education and Sport. Universitas Negeri Jakarta*, 3(1), 85-99. <https://doi.org/https://doi.org/10.21009/JIPES.031.011>

- Sajoto, M. 1988. *Pembinaan Kondisi Fisik Dalam Olahraga*. Jakarta: Departemen Pendidikan dan Kebudayaan Direktorat Jendral Pendidikan Tinggi Proyek Pengembangan Lembaga Pendidikan Tenaga Kependidikan
- Saleh, M. (2020). Pengaruh Latihan Zig-Zag Run Dan Latihan Boomerang Run Terhadap Keterampilan Menggiring Bola Dalam Permainan Sepakbola Pada Siswa Sma Negeri 1 Polut Kab. Takalar. *E-Prints Universitas Negeri Makassar*. <http://eprints.unm.ac.id/17235/>
- Santoso, N. (2014). Tingkat Keterampilan Passing-Stoping Dalam Permainan Sepakbola Pada Mahasiswa PJKR B Angkatan 2013. *Jurnal Pendidikan Jasmani Indonesia, Volume 10*,(2), 40–48. <https://journal.uny.ac.id/index.php/jpji/article/view/5699>
- Sudirman, Syahrudin, & Sahabuddin. (2022). Tingkat Keterampilan Gerak Dasar Sepakbola Pada Siswa SMA Negeri 2 Majene. *JOKER, Jurnal Olahraga Kebugaran Dan Rehabilitasi*, 2(1), 43–52. <https://doi.org/https://doi.org/10.35706/joker.v2i1.6479>
- Sukadiyanto. 2011. *Pengantar Teori dan Metodologi Melatih Fisik*. Bandung: Lubuk Agung.
- Supriyanto, E., Koestoro, B., & Djasmi, S. (2016). Pengaruh Pendekatan Teknis dan Taktis Terhadap Keterampilan Teknik Dasar Permainan Sepakbola Pada Siswa SMPN 1 Kotabumi. *Jurnal Teknologi Informasi Komunikasi Pendidikan*, 4(2), 1–10. <http://jurnal.fkip.unila.ac.id/index.php/JT/article/view/11675>
- Taufan, J., Ardisal, A., Damri, D., & Arise, A. (2018). Pelaksanaan Pembelajaran Pendidikan Jasmani Adaptif bagi Anak dengan Hambatan Fisik dan Motorik. *Jurnal Pendidikan Kebutuhan Khusus*, 2(2), 19. <https://doi.org/10.24036/jpkk.v2i2.496>
- Wiarto. Giri. 2013. *Fisiologi dan Olahraga*. Yogyakarta: Graha Ilmu.
- Yuniartik, H., Hidayah, T., & Nasuka. (2017). Evaluasi Pembelajaran Pendidikan Jasmani Olahraga dan Kesehatan di SLB C Se-Kota Yogyakarta. *Journal of Physical Education and Sports*, 6(2), 148–156. <https://journal.unnes.ac.id/sju/index.php/jpes/article/view/17389>