The Relationship Between Balance And Leg Muscle Power Towards Shooting In Futsal GamesAt Smk Swasta Free Methodist 2 Medan

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Abstract.

Background Shooting technique is the fundamental skill that determines the winning point in futsal. Accurate shooting technique requires several key components, including balance and leg muscle strength.

Objectives This study aimed to determine the relationship between balance and leg muscle power and the quality of shooting ability using the instep in futsal. This was a correlational study. The study involved 20 futsal players from SMK Swasta Free Methodist 2 Medan.

Methods The instruments used in this study were balance tests using the Modifield Bass Test, leg muscle power using the Standing Broad or Long Jump, and shooting skills using the target of the shooting skills test. Data analysis techniques in this study used a simple correlation test using the product moment correlation formula and multiple correlation using the regression line equation.

Results Based on the results of this study, it shows: (1) the relationship between balance and futsal shooting ability using the instep R is 0.472 with a sig. value of 0.002, (2) the relationship between leg muscle power and futsal shooting ability using the instep R is 0.045 with a sig. value of 0.000, (3) the relationship between balance and leg muscle power and futsal shooting ability using the instep R is 0.809, R2 is 0.654 with a sig. value of 0.001.

Conclusion The relationship between balance and leg muscle power with futsal shooting ability using the instep in futsal is significant.

Keywords: Balance, Leg Muscle Power, Shooting, Futsal

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INTRODUCTION

Introduction Futsal can be played by anyone, regardless of age. As people grow older, this game can improve social, mental, and physical development (Tessitore et al., 2008). Ahmad-Shushami and Abdul-Karim (2020) stated that futsal is a game that is currently developing very rapidly. The rise of amateur and professional futsal teams and futsal players in schools and universities is proof of this. This is supported by the regular holding of tiered events and inter-club tournaments at the municipal, city, provincial, national, and even international levels. In Indonesia, futsal is growing rapidly, claims Weinberg (2012). The availability of futsal facilities in various cities and regions throughout the country is a sign of this. This shows that futsal is starting to become popular in Indonesia. Since being invented by Juan Carlos Ceriani in Uruguay in 1930, futsal has become a legend among ball sports fans, according to Novoseltsev (2020). Futsal has been widely played in Indonesia since the 2000s. However, recently, many people have begun to become familiar with it, especially in urban and rural areas (Gunawan, 2014).

The Indonesian Futsal Association (AFI) was formed to oversee futsal in Indonesia since the sport's early development (Moura et al., 2011). Futsal is a complex sport due to its unique strategies and techniques (De Oliveira Bueno et al., 2018). Players must master the fundamentals of futsal (Salahuddin et al., 2021). Futsal players with strong fundamental skills typically excel in the game (Filho et al., 2022). Some examples of fundamental futsal skills are: receiving, heading, passing, chipping, and dribbling. Furthermore, because futsal differs from other sports, each player must be in high physical condition. According to Iqbal et al. (2019), futsal demands a high level of speed, endurance, strength, and agility over long periods of time.

According to Togar Togatorop and Dicky Hendrawan (2020), players can control the ball to win by using various combinations of movements and techniques on the field. How well a player shoots the ball into the goal depends on several factors, including leg strength and balance. Strong leg muscles and speed contribute to leg strength, therefore leg strength is crucial for penalty kicks. A related study by Tita Rosita in 2019 found that kicking accuracy is influenced by balance. However, in practice, players' quick passes and kicks are crucial for playing futsal on the field. Professional futsal teams are able to control the ball, execute accurate passes, dribble and kick effectively, support each other, create space for movement, and collaborate effectively. Furthermore, each player's unique skills are crucial to building a successful soccer team.

Yogi Ferdy Irawan and Indra Prayoto (2021) stated that the most popular futsal game is kicking, which is defined as passing the ball and then kicking or shooting. Although it seems simple, this technique requires focus and timing for players to kick towards the main goal, which is the main goal. Budiyanto and Setiowati (2017) emphasized that penalty shootouts are a useful tactic to score as many goals as possible against the opponent's goal. There are several ways to kick in futsal, including using the heel, the inside of the foot, the outside of the instep, the tip of the foot, and the inside of the foot (Windiartha et al., 2017). However, because it is more successful in several ways, including power, accuracy, and a higher probability of scoring, players most often use the instep (Yuniarto et al., 2018). To be able to kick well, futsal players need complex movement skills (Gama et al., 2020). To kick, a player must also be physically strong. This is evident when a player uses shooting skills in a limited time situation and physical fatigue (Walker, 2018). Because mental, tactical, and technical skills can only be effectively developed when physical qualities are high, an athlete's success is highly dependent on their physical attributes (Rachmawati et al., 2021; Reynolds et al., 2002). Researchers examined six top futsal instructors and found that a futsal athlete must have strong leg muscles and balance to prevent any situation that causes a decline in the athlete's overall performance.

An athlete's inability to practice basic shooting skills is one factor that contributes to poor shooting accuracy in futsal. Futsal requires not only basic skills but also other aspects of physical ability, including strength, endurance, explosive power, speed, flexibility, agility, and balance. Agility, flexibility, speed, and balance are some of the motor skills required in playing soccer (de Keijzer et al., 2020). A futsal player must practice more to achieve maximum shooting accuracy because balance training is crucial and mandatory. According to Sopyan et al. (2019), improving ankle-foot synchronization can result in more accurate shots. This is usually due to the fact that balance is crucial for all athletic movements. Futsal players, in particular, must perform very complex movements (Faigenbaum et al., 2016). These complex movements can be performed well by players who can balance their entire body (Kidd, 2013). Because they use only one foot and swing the other leg to kick the ball while using their hands to maintain body balance, futsal players must have good balance. To support the foot and enable them to kick the ball powerfully, the leg muscles must be strong (Lupo et al., 2014b). The opposing goalkeeper will find it more difficult to block the ball if the player kicks it powerfully (Lupo et al., 2012).

The reality is that shooting is not a skill possessed by students at the Free Methodist 2 Medan Private Vocational School Extracurricular Activity. Many of them perform it with little effort and accuracy. Futsal at Free Methodist 2 Medan is frequently played by the private vocational school's extracurricular team, both in practice and in competitions. The players often win every match, but they still struggle with finishing. The majority of players consistently miss their shots. For example, approximately 95% of players in a game involving students participating in the Free Methodist 2 Medan Private Vocational School Extracurricular Activity. The players played very well throughout the match, passing the ball and making good passes, but recently their shots have lacked power and have been missing the target.

METHOD

Research Design

This research is a quasi-experimental study. Experimental research methods aim to describe the cause-and-effect relationship between one variable and another. Experimental research is characterized by the administration of treatment to the research sample. The method used is a survey, with data collection techniques utilizing tests and measurements. Surveys are investigations conducted to obtain facts from existing phenomena and identify factual deficiencies.

Participant

This research was conducted with 20 subjects from the Free Methodist 2 Private Vocational School in Medan..

Data Analysis

There are two types of data analysis in research, namely statistical data analysis and non-statistical analysis. Statistical analysis is a scientific method applied to analyze, collect, organize, and present research data in the form of numbers to answer research hypotheses. The data analyzed are independent variable data, namely, (X1) balance, (X2) leg muscle power (Y) shooting results.

RESULTS AND DISCUSSION

Results

The results of this study will explain a general description of the results obtained on the Correlation of Balance and Leg Muscle Power to the Quality of Shooting Ability in Futsal Games, related to the results of the study will be explained in more detail in the results of the analysis and discussion.

1. Research Data Description

a) This study consists of three independent variables: Balance (X1), Leg Muscle Power (X2), and the dependent variable, Shooting Ability (Y). The results of each variable are described based on predetermined categories. The detailed description of the research data obtained for each variable is as follows:

b) a) Balance, denoted by X1, obtained a maximum score of 90, a minimum score of 60, a mean of 69.90, and a standard deviation of 9.947.

c) b) Leg Muscle Power, denoted by X3, obtained a maximum score of 1.92, a minimum score of 1.77, a mean of 1.82, a standard deviation of 0.0387, and a median of 1.82.

d) c) Shooting Ability from the research data on the relationship between Balance and Leg Power on Shooting Ability which has been analyzed using the SPSS 25.0 for Windows program, the maximum score obtained was 25, the minimum score was 17, the Mean obtained was 20.15, the Standard Deviation obtained was 2.815, and the Median was 20.

2. Prerequisite Test Results

Before testing a hypothesis, several prerequisite tests must be met to ensure the results are reliable. These requirements include normality and linearity tests. The results of the prerequisite analysis and hypothesis testing are presented below.

a) The normality test was conducted using the Shapiro-Wilk formula using SPSS. The rule used to determine whether research data is normally distributed is that if the sig. 0.05 (5%) is greater than 0.05, the data is considered normally distributed.

Based on the statistical data on shooting ability in futsal, divided into several groups, the results showed that the Balance component (X1) had a sig. 0.771. A significance value greater than 0.05 indicates a normal distribution. Furthermore, the Leg Muscle Power component (X2) had a sig. 0.736. A significance value greater than 0.05 indicates a normal distribution. The Shooting Ability component (Y) also had a sig. 0.736. 0.441, because the significance value is greater than 0.05, meaning the data is normally distributed.

b) Linearity Test The purpose of the linearity test is to determine whether the relationship between the independent and dependent variables is linear or not. The test uses the SPSS application by looking at the deviation from linearity at a significance level of 0.05. It is stated to have a linear relationship if the significance value of the deviation from linearity is more than 0.05. The results of the linearity test above show the relationship between Balance (X1) and Shooting Ability (Y) obtained a sig value of 0.41> 0.05 meaning that there is a linear relationship between the Balance variable and Shooting Ability meaning there is a linear relationship between the Leg Power variable and Shooting Ability.

3) Hypothesis Testing

After the data prerequisite test is fulfilled, the next step is to test the hypothesis proposed in this study, namely the relationship between Balance (X1) and Leg Power (X2), on Shooting Ability (Y). The relationship of each X1 with Y, the relationship of X2 with Y, and the relationship of X3 with Y, uses the product moment correlation test from Karl person, while the relationship of X1, X2, and X3, together with Y

uses multiple regression analysis with the F test. The results of the correlation test and multiple regression analysis are as follows:

a) Correlation Analysis is used to find the relationship between two variables, namely the independent variable and the dependent variable. The relationship between Balance and shooting ability, the first correlation looks for the relationship between balance and shooting ability. The results of the analysis show that the R value is 0.623 with a sig value of 0.003 <0.05, so it can be stated that there is a positive relationship which is in the interpretation category very strong. The relationship between Leg Power and Shooting Ability, the third correlation test looks for the relationship between Leg Power and Shooting Ability. The results of the analysis show that the R value is 0.045 with a sig value of 0.000 <0.05, so it can be stated that there is a positive relationship which is in the interpretation category quite strong.
b) Correlation and Multiple Regression. The results of hypothesis testing with correlation analysis and multiple regression, it is known that the overall correlation of variable X together with variable Y is 0.809, with the percentage contribution given by the independent variable to the dependent variable obtained an R square figure of 0.654 or 65.4%. This shows that the percentage contribution of the influence of the independent variable to the dependent variable provides a significant contribution to the variable, balance and leg muscle power with the ability to shoot using the instep of 65.4% or the variation of the independent variables used in the model is able to provide a contribution of 65.4% while the remaining 34.6% is influenced by other variables not included in this research model.

Discussion

Based on the results of the hypothesis testing above, the independent variables have a positive and significant relationship with the dependent variables, both individually and collectively. The discussion of the hypothesis testing results is as follows:

1. The Relationship Between Balance and Shooting Ability

Balance plays a central role in determining a player's ability to shoot the ball towards the goal (Serrano et al., 2020). Shooting ability in futsal is not only about strength and technique, but also requires optimal stability of the player's body (Barron et al., 2020). Balance is an aspect that encompasses stability and control of overall body movements (Subarkah & Hariyanto, 2021). In the context of futsal shooting ability, balance affects various technical and tactical aspects. Good balance allows players to maintain proper body position when shooting, both from a stationary position and while moving. Without sufficient balance, players tend to lose precision and power in their shots. Poor balance can also result in players being unstable when attempting to shoot, which in turn can lead to wasted good opportunities.

Good balance also allows players to quickly adapt to changing situations on the pitch. In futsal, situations often change rapidly, and players need to be able to adapt to these changes. Strong balance helps players stay focused and control their movements efficiently, allowing them to quickly adjust their body position and shoot accurately even in stressful situations (Ribeiro et al., 2020). The importance of balance in futsal shooting ability is also evident in game strategy. Teams with players with good balance tend to be more effective in attacking and scoring goals. Strong balance allows players to be more flexible in their movements on the pitch, thus creating better and more frequent shooting opportunities (Corbit, 2018). Balance is closely related to shooting ability in futsal. Good balance affects various technical and tactical aspects of shooting ability, including precision, power, and the ability to adapt to changing game situations (Park et al., 2021). It is crucial for futsal players to consistently train and develop their balance through appropriate physical and mental training (Fernandez et al., 2022). By understanding the importance of balance in their performance, players can improve their shooting ability and make a greater contribution to their team in futsal matches.

2. The Relationship Between Leg Power and Shooting Ability

Leg power, or strength in the legs, is a crucial factor in determining a futsal player's shooting ability (Duenas et al., 2020). Shooting ability in futsal encompasses various aspects, such as accuracy, speed, and kicking power (Macinnis et al., 2017). Leg power is closely related to futsal shooting ability because it plays a role in generating the power and speed necessary for an accurate and lethal kick (Tessitore et al., 2008).

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kicking power (Macinnis et al., 2017). Leg power is closely related to futsal shooting ability because it plays a role in generating the power and speed necessary for an accurate and lethal kick (Tessitore et al., 2008).

Leg strength also influences the speed of the ball when released by a player. The stronger a player's leg strength, the faster the ball can travel towards the opponent's goal. This ball speed can make it difficult for the opposing goalkeeper to anticipate the direction and power of the kick, thus increasing the player's chances of scoring. In counter-attacking situations, the speed of the kick generated by strong leg power can be a powerful weapon for the team to exploit gaps in the opponent's defense. Strength in leg power also contributes to stability and balance when a player kicks the ball (Ahmad-Shushami & Abdul-Karim, 2020). Players with strong leg power tend to have better control over their kicks, allowing them to maintain accuracy even in difficult situations. This is especially important in futsal, where space is often limited and any mistake can be exploited by the opponent.

Besides directly impacting shooting ability, leg strength also plays a role in improving a player's endurance and physical strength (Weinberg, 2012). Exercises to develop leg power involve a variety of movements, including sprints, jumps, and other movements that require leg muscle strength. By increasing strength and physical endurance, players will be able to maintain their best performance throughout the match, including in crucial moments where shooting ability is most needed. Leg power has a significant relationship with shooting ability in futsal. Leg strength influences a player's strength, speed, stability, and physical endurance, all of which are crucial factors in creating accurate and lethal shots (Novoseltsev, 2020). However, to become an effective futsal player, other aspects such as technique and tactical understanding are also needed. This way, players can achieve their best goal-scoring performance and contribute maximally to their team.

CONCLUSION

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that:

1) There is a significant relationship between balance and futsal players' shooting ability, with an R2 value of 0.623 and a sig. 0.003. Since this result is <0.05, it can be concluded that there is a positive relationship and has a fairly strong interpretation for shooting results.
2) There is a significant relationship between leg power and futsal players' shooting ability, with an R2 value of 0.045 and a sig. 0.000. Since this result is <0.05, it can be concluded that there is a positive relationship and has a fairly strong interpretation for shooting results.
3) There is a significant relationship between balance and leg muscle power and instep shooting ability in futsal, with an R2 value of 0.654 and a sig. 0.001.

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AUTHOR CONTRIBUTION STATEMENT

This research was conceptualized and designed by Taufik Hidayah, who developed the research objectives and methodology, managed data collection, coordinated with participants, and supervised fieldwork at SMK Swasta Free Methodist 2 Medan. Benny Arial M. performed data analysis, interpreted the findings, and contributed significantly to the preparation of the manuscript. All authors participated in the revision of the manuscript, approved the final version for submission, and take full responsibility for the integrity and accuracy of the work.

CONFLICT OF INTEREST AND FUNDING

The authors declare no conflict of interest related to the conduct, authorship, or publication of this study.

REFERENCES

Aaa Adin, Y. (2024). Upaya Meningkatkan Kemampuan Shooting Dalam Permainan Sepak Bola Dengan Metode Permainan Target Pada Siswa KELAS XI IPA SMK NEGERI 1 Tumbang Titi Kabupaten Ketapang (Doctoral dissertation, IKIP PGRI PONTIANAK).

Ahmad Hasbullah Amza, & Fitranto, N. (2019). Pemahaman Pelatih Futsal Liga Aafi U16 Pada Peraturan Pertandingan Sesuai Manual Liga. Jurnal Ilmiah Sport Coaching and Education. https://doi.org/10.21009/jsce.03215

Alvares, P. D., Chaves, P. J., Junior, M. N. S. de O., Fernandes, T. L. B., Veneroso, and Futsal Affected by the Relative Age Effect? The Portuguese Football Association Case. Frontiers in Psychology. https://doi.org/10.3389/fpsyg.2021.679476

Anggara, D., Usra, M., & Solahudding, S. (2018). Latihan Melempar Bola Basket Ke Dinding Dengan Sasaran Lingkaran Terhadap Shootingfree Throwbola Basket Pada Siswa Smp. Jurnal Olahrga Dan Kesehatan ALTIUS, 7(2), 192 200.

Angoorani, H., Haratian, Z., Farmanara, H., & Jahani, P. (2021). Lower physical fitness is associated with injuries in iranian national futsal teams: A prospective study. Asian Journal of Sports Medicine. https://doi.org/10.5812/ASJSM.110778

Ardiyanto, M. D., Januarto, O. B., & YudaSMKra, D. S. (2021). Peningkatan Keterampilan Dasar Passing Futsal Memakai Metode Drill Bervariasi. Sport Science and Health. https://doi.org/10.17977/um062v3i112021p921-928

Aryanto, B., Sukoco, P., & Lumintuarso, R. (2020). The validity of construct analysis on assessment instrument of basketball skill for senior high school in Yogyakarta City. International Journal of Human Movement and Sports Sciences, 8(5), 193 198. https://doi.org/10.13189/saj.2020.080506

Badru, B. (2021). The Fea Game. JPI (Jurnal Pendidikan Indonesia). https://doi.org/10.23887/jpi-undiksha.v10i3.29359

Barron, D. J., Collins, D., & Carling, C. (2020). Match performance in a reference futsal team during an international tournament - implications for talent development in soccer Christopher Yiannaki. Biology of Sport. https://doi.org/10.5114/BIOLSPORT.2020.93040

Bekris, E., Gioldasis, A., Gissis, I., Katis, A., Mitrousis, I., & Mylonis, E. (2022). Effects of a Futsal Game on Metabolic, Hormonal, and Muscle Damage Indicators of Male Futsal Players. Journal of Strength and Conditioning Research. https://doi.org/10.1519/JSC.0000000000003466

Budiyanto, R. T., & Setiowati, A. (2017). Efektivitas Terapi dengan Pemberian Teknik Dasar Futsal untuk Meningkatkan Keterampilan Motorik Kasar pada

C. E., & Cabido, C. E. T. (2020). Effects of puberty on jump and sprint performance in young futsal players. Revista Brasileira de Medicina Do Esporte. https://doi.org/10.1590/1517-869220202602215518

Cardon, L. (2022). Fused filament fabrication of copolyesters by understanding the balance of inter- and intra-layer welding. Plastics, Rubber and Composites. https://doi.org/10.1080/14658011.2020.1855386

Chapaev, N., Akimova, O., Dorozhkin, Y., Efanov, A., & Bychkova, E. (2021). Integration of Pedagogical and Production Factors in the Process of the Formation of Industry 4.0. TEM Journal. https://doi.org/10.18421/TEM104- 62

Corbit, L. H. (2018). Understanding the balance between goal-directed and habitual behavioral control. In Current Opinion in Behavioral Sciences. https://doi.org/10.1016/j.cobeha.2018.01.010

Cosmin, D., & Mircea, N. (2014). The development of futsal game at national level by implementing a strategic competitive and training management. Ovidius University Annals, Series Physical Educationa & Sport/Science, Movement & Health, XIV(2), 376 380.

Damayanti, C., & Adriani, M. (2021). Correlation Between Percentage Of Body Fat With Speed And Cardiorespiratory Endurance Among Futsal Athletes In Surabaya. Media Gizi Indonesia. https://doi.org/10.20473/mgi.v16i1.53-61

de Keijzer, C., Bauwelinck, M., & Dadvand, P. (2020). Long-Term Exposure to Residential Greenspace and Healthy Ageing: a Systematic Review. Current Environmental Health Reports. https://doi.org/10.1007/s40572-020-00264-7

Duenas, V. H., Cousin, C. A., Ghanbari, V., Fox, E. J., & Dixon, W. E. (2020). Torque and cadence tracking in functional electrical stimulation induced cycling using passivity-based spatial repetitive learning control. Automatica. https://doi.org/10.1016/j.automatica.2020.108852

Etedadi Aliabadi, F., Agbossou, K., Kelouwani, S., Henao, N., & Hosseini, S. S. (2021). Coordination of SMKrt home energy management systems in neighborhood areas: A systematic review. IEEE Access. https://doi.org/10.1109/ACCESS.2021.3061995

Filho, C. V. M., Nogueira-Silva, L. F., Gallati, L. R., Scaglia, A. J., Montagner, P. C., & Carnicelli, S. (2022). Teaching futsal in schools: perspectives of teachers from Rio Grande do Sul and São Paulo state. Motriz. Revista de Educacao Fisica. https://doi.org/10.1590/S1980-657420210011921

Gunawan, I. (2014). Tingkat Pengetahuan Tentang Taktik dan Strategi Bermain Futsal pada Siswa Peserta Ekstrakurikuler Futsal di SMK MUHAMMADIYAH 1 Muntilan Tahun 2014. English Language Teaching.

Hutomo, A. S., Kristiyanto, A., & Purnama, S. K. (2019). The Use of Video Media in Improving Futsal Basic Techniques Skills of Male Students of Futsal Hobbyist. International Journal of Multicultural and Multireligious Understanding, 6(4), 140. https://doi.org/10.18415/ijmmu.v6i4.969

Iqbal, M., Iqbal, M., ASMKwi, M., Tangkudung, J., Dlis, F., & Saputra, S. A. (2019). Interactive Multimedia Development in Futsal Basic Techniques. Journal of Education, Health and Sport, 9(10), 121 131. https://doi.org/10.5281/zenodo.3491207

Kidd, B. (2013). The Olympic Movement and the sports-media complex. Sport in Society. https://doi.org/10.1080/17430437.2013.785754

Kimura, A., Yokozawa, T., & Ozaki, H. (2021). Clarifying the Biomechanical Concept of Coordination Through Comparison With Coordination in Motor Control. In Frontiers in Sports and Active Living. https://doi.org/10.3389/fspor.2021.753062

Sopyan, I., Permata, R. D., Gozali, D., & Syah, I. S. K. (2019). Formulation of lotion from black tea extract (Camellia sinensis linnaeus) as sunscreen. International Journal of Applied Pharmaceutics.

Subarkah, A. J., & Hariyanto, E. (2021). Upaya Untuk Meningkatkan Pemahaman Peraturan Permainan Futsal Melalui Pembelajaran Daring Untuk Siswa Esktrakurikuler Futsal. Sport Science and Health. https://doi.org/10.17977/um062v3i112021p909-920

Syafruddin. 2011. Ilmu Kepelatihan Olahraga Teori dan Aplikasinya Dalam Pembinaan Latihan. UNP Press Padang. Padang.

Tan, Z. S., Burns, S. F., Pan, J. W., & Kong, P. W. (2020). Effect of caffeine ingestion on free-throw performance in college basketball players. Journal of Exercise Science and Fitness, 18(2), 62 67. https://doi.org/10.1016/j.jesf.2019.12.002

Tessitore, A., Meeusen, R., Pagano, R., Cbenvenuti, I., Tiberi, M., & Capranica, L. (2008). Effectiveness of active versus passive recovery strategies after futsal games. Journal of Strength and Conditioning Research. https://doi.org/10.1519/JSC.0b013e31817396ac

Togar Togatorop, & Dicky Hendrawan. (2020). Study Of Basic Technique Skills For Playing Futsal For Futsal Extracurricular Participants In SMK Negeri 2 Lubuk Pakam In 2020. Journal Physical Health Recreation.

Tuna Grahita Ringan. Media Ilmu Keolahragaan Indonesia.

Walker, O. (2018). Impact investors shoot for clearer goals. FT.Com.

Windiartha, A., Kristiyanto, A., & Purnama, S. K. (2017). The Develompment of Media Based on Adobe Flash Player in Training Basic Technique of Futsal. Journal of Physical Education Health and Sport.

Yogi Ferdy Irawan, & Indra Prayoto. (2021). Survey of Basic Technical Skill for Futsal Male Student High School. JUMORA: Jurnal Moderasi Olahraga.

Yuniarto, A., Supriyadi, S., & Sudjana, I. N. (2018). Pengembangan Media Pembelajaran Berbasis Mobile Learning Teknik Dasar Dan Peraturan Permainan Futsal. JP.JOK (Jurnal Pendidikan JaSMKni, Olahraga Dan Kesehatan), 2(1), 51 62. https://doi.org/10.33503/jpjok.v2i1.188

Zhang, M., Kalies, W. D., Kelso, J. A. S., & Tognoli, E. (2020). Topological portraits of multiscale coordination dynamics. In Journal of Neuroscience Methods. https://doi.org/10.1016/j.jneumeth.2020.108672

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