Development of control and chipping skills test instruments: u-23 professional futsal players in Central Java province

Desarrollo de instrumentos de prueba de habilidades de control y chipping: jugadores profesionales de fútbol sala sub-23 en la provincia de Java Central

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Abstract

Introduction: The measurement of basic skills in playing futsal requires the right instruments so that the level of futsal skills can be measured for the purposes of learning and improving achievement.
Objective: This research aims to produce a form of futsal basic skills test through test control measurements and test chips and produce validity and reliability for the learning process.
Methodology: The research design used is development research by developing products for U futsal players 18-23 years old with a sample of 15 players for small groups and 90 futsal players for large groups.
Results: The study found that the validation and reliability test of the instrument consisting of control skills obtained a validity value of 0.971 and reliability of 0.943. Meanwhile, the chipping test found a validity value of 0.887 and reliability of 0.935.
Discussion: The validity and reliability of the instrument reflects the extent to which the test can accurately measure the intended capability, while reliability ensures that measurements can provide consistent results even when performed under a variety of conditions and times.
Conclusions: So based on the results of the study, it can be concluded that the measuring tool is reliable or will still produce the same relative value even though it is done at different times.

Keywords

Development; test instruments; control; chipping; futsal.

Resumen

Introducción: La medición de las habilidades básicas en el juego de fútbol sala requiere los instrumentos adecuados para que el nivel de habilidades de fútbol sala pueda medirse con el fin de aprender y mejorar el rendimiento.
Objetivo: Esta investigación tiene como objetivo producir una forma de prueba de habilidades básicas de fútbol sala a través de mediciones de control de prueba y chips de prueba y producir validez y confiabilidad para el proceso de aprendizaje.
Metodología: El diseño de investigación utilizado es una investigación de desarrollo mediante el desarrollo de productos para jugadores de fútbol sala U de 18 a 23 años con una muestra de 15 jugadores para grupos pequeños y 90 jugadores de fútbol sala para grupos grandes.
Resultados: El estudio encontró que la prueba de validación y confiabilidad del instrumento consistente en habilidades de control obtuvo un valor de validez de 0,971 y de confiabilidad de 0,943. Por su parte, la prueba de chipping encontró un valor de validez de 0,887 y una fiabilidad de 0,935.
Discusión: La validez del instrumento refleja el grado en que la prueba puede medir con precisión la capacidad en cuestión, mientras que la confiabilidad garantiza que las mediciones puedan proporcionar resultados consistentes incluso cuando se realizan en una variedad de condiciones y tiempos.
Conclusiones: Por lo tanto, en función de los resultados del estudio, se puede concluir que la herramienta de medición es fiable o seguirá produciendo el mismo valor relativo aunque se haga en diferentes momentos.

Palabras clave

Desarrollo; instrumentos de prueba; control; astillado; fútbol sala.

Introduction

Sports is a form of efforts to improve the quality of Indonesian people which is directed at the formation of character and personality, high discipline and sportsmanship, as well as an increase in achievements that can arouse a sense of national pride. Sports activities include various branches such as futsal, football, athletics, games, water sports, martial arts, and others (Bafirman et al., 2023). Therefore, the movement to popularize sports and exercise people needs to be carried out more intensively in all corners of Indonesia. However, the awareness of the importance of this movement has many major obstacles that need to be faced to make people interested in doing sports, starting from lifestyle, development of the times, and education level, and so on. Futsal is played in teams with a total of five players from each team, and faces each other to create goals against each other. Futsal has now grown rapidly into a popular sport in the community from various circles This sport has also been competed at the beginner, semi-professional, and even professional levels. The importance of skills and the identification of player skills is the basis for creating an objective, valid, and rallyable tool. So far, futsal has not had a standard form of test to determine the level of skill of each individual athlete in playing futsal (Nia et al., 2023).

Futsal has become one of the increasingly popular sports in Indonesia, especially among the younger generation. This popularity is not only marked by the increasing number of tournaments and competitions in different regions, but also by the formation of new futsal clubs and the enthusiasm of the community. In coaching players in the under-23 age category (U-23) to be a strategic age group for the development of futsal playing skills, this is based on the fact that this age group is at the peak of physical and cognitive development, so it has great potential to be fostered to become outstanding professional athletes at the national and international levels (Hara et al., 2020). This needs to be applied to the sample because the researcher focuses on the U-23 players who will later become the successors of the national golden generation. Although futsal is developing, efforts to improve the quality of players have not been fully balanced with effective measurement instruments that are in accordance with the characteristics of futsal sports (Spyrou et al., 2022). One of the crucial aspects in the game of futsal is basic technical skills, especially control and chipping. Control skills are essential to maintain possession of the ball in fast game situations and tight spaces (Dal Pupo et al., 2017). Meanwhile, chipping is necessary to provide precise passes or shots, especially in dealing with opponent defensive situations (Rezaimanesh et al., 2011). These two skills not only determine the individual abilities of the player, but also greatly affect the overall success of the team (Rinaldo et al., 2022).

The measurement of control and chipping skills in U-23 futsal players in Indonesia, especially in Central Java Province, still faces various obstacles. Based on observations and interviews with futsal coaches in the province, it was found that testing player skills is often carried out subjectively, only based on the visual assessment of the coach without using standard and standardized test instruments. As a result, the results of the assessment are often inconsistent and cannot be used as a reference for decision-making, such as player selection, training program planning, or evaluation of training results. The development of valid and reliable test instruments in measuring control and chipping skills is also increasing due to the competitive nature of futsal today. Competitions at the regional, national, and international levels require each team to have accurate data about their players' abilities. Without adequate measurement instruments, coaches will have difficulty identifying the strengths and weaknesses of each player, resulting in less effective coaching strategies (Yoshida et al., 2023). In addition, the lack of appropriate instruments also has the potential to hinder the coaching of young athletes, due to the absence of clear standards for objectively evaluating the development of their skills (Villanueva-Guerrero et al., 2024).

This research is important because it aims to answer this need through the development of control and chipping skill test instruments that can be used practically by coaches, players, and sports academics. The development of this instrument will not only help improve the quality of individual skill assessments, but also make a significant contribution in the field of sports science, especially related to the measurement of futsal athletes' performance. Research that has been conducted by (Müller et al., 2018), regarding the development of a futsal basic skills instrument model that has produced high validity and reliability values, but this test is limited to the age group of children. In line with research (Nogueira et al., 2018) developed a futsal test with valid results, but it has limitations, namely the dominance of the physical aspect is greater in this test. From some of these studies, there is a need for follow-up to develop

a tool to measure futsal playing skills that is in accordance with the characteristics of players and the actual futsal game.

To make a test or instrument, there are several criteria that must be met, namely the level of validity and reliability must be tested first (Teunissen et al., 2021). In this case, the researcher will make a skill test, then test the validity of the test by correlating the test results with the combined score of the test items created (total score). Measuring the level of validity of a test can be done by using several methods, namely: test-retest techniques, halving, equivalent measurements (Ismail et al., 2016). According to (de Oliveira et al., 2019) it is stated that in making a test or instrument there are several criteria that must be met, namely the level of validity and reliability must be tested first. In this case, the researcher will make a skill test, then test the validity of the test by correlating the test results with the combined score of the test items created (total score). Validity and reliability tests are carried out from the test items created (total score). These elements are the foundation in sports coaching (Tienza-Valverde et al., 2023). For this reason, it is necessary to measure all the main completeness of the player so that the coach is able to know the development of his students, especially in the futsal sport.

The choice of research location in Central Java Province has strategic relevance. As one of the provinces with a high population and a fairly strong sports tradition, Central Java has many active futsal clubs and tournaments that are regularly held. However, there has been no previous research that specifically developed a skill test instrument for futsal players in this province, so this research is expected to provide direct benefits to the local futsal community. The development of this skill test instrument is based on the need for validity, reliability, and practicality in performance measurement. The developed instrument will go through systematic stages, starting from needs analysis, test design, field trials, to instrument validation. The approach used will involve the direct participation of U-23 futsal coaches and players in Central Java, so that the resulting instruments are really relevant to the actual conditions of the futsal game.

Futsal is one of the sports that is known and played both nationally and internationally. There are prestigious championships that have been enforced. So the importance of this research refers to the game pattern of professional athletes. Based on the results of the existing literature review, the trainer only provides training programs as usual. So that this will certainly have an impact on the players, one of which is the relatively monotonous training. Therefore, it is important for trainers to understand the context of making modifications to training programs that are not relatively monotonous but still refer to the training goals to be achieved. Through this research, it is hoped that an instrument can be created that not only measures skills more objectively, but also provides constructive feedback for players and coaches. With a standard instrument, the coach can design a more targeted training program, while the player can know the specifics of the aspects of skills that need to be improved. In addition, the results of this research also have the potential to be adopted by other parties, such as futsal academies, sports schools, and futsal organizations at the national level.

Method

The research design used is development research with procedures for planning product development to be developed. The researcher makes a product design that is developed based on the results of the needs analysis. Researchers developed a control and chipping training model to be used in the training activities of professional athletes.

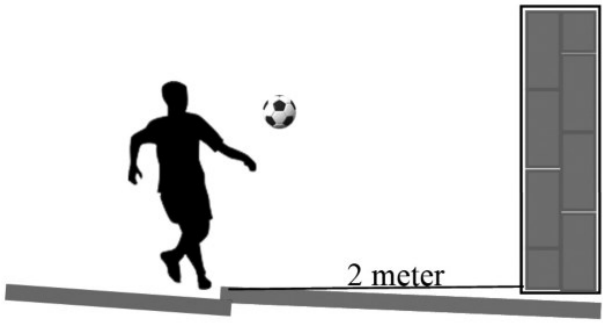
Product trials are carried out after the validator makes revisions and improvements. The purpose of this trial is to find out how effective the product is developed. Product trial design is carried out by means of product validation and trials. Product validation is carried out by validators, material matter experts, and media experts. The basis for sampling in this study is through the existing inclusion criteria, including: (1) players aged 18-23 years in futsal players, (2) physically and spiritually healthy, (3) willing to participate in training during the study, (4) players are athletes of the Central Java Provincial Sports Week, including Surakarta Regency, Karanganyar Regency, regencies, namely Banyumas Regency, Klaten Regency, Kebumen Regency, Kendal Regency and Kudus Regency. So based on these criteria, the researcher obtained a sample of 105 subjects.

Furthermore, after the validation test by expert experts, the researcher continued to the next stage, namely conducting a small-scale test on subjects as many as 15 players and 90 players to continue to the large group trial stage. Finally, after the test is completed, a validity, and reliability test and norms are carried out on the product skill test in order to find out the level of usefulness of the product to be disseminated.

Results

1. Control Techniques.

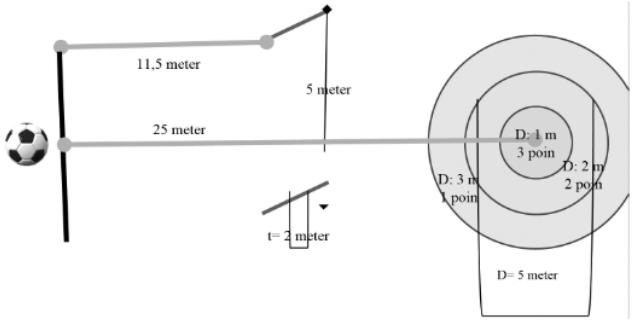
Figure 1. Control Test



- The purpose of this test is to measure the components of ball possession ability.
- The tools needed are 3 balls, duct tape and a target wall.
- Implementation instructions.
  - ✓ Testee is at a distance of 2 meters from the wall.
  - ✓ Testees must control first and then kick the ball towards the wall.
  - ✓ The bounce of the ball must be able to be controlled again and kicked back.
  - ✓ The activity lasts for 1 minute.
  - ✓ If the ball falls too far, the player uses a reserve ball.
- How to Score
  - ✓ A count of 1 is obtained if the player is able to kick and take control.
  - ✓ It is not calculated if at the time of control, the footrest is in an area of less than 2 meters.
  - ✓ The final result is the number of points obtained during the performance in 60 seconds.

1. Chipping Test.

Figure 2. Chipping Test



- Th The purpose of this test is to measure the high ball passing accuracy component.
- Tools/facilities: 5 balls, 5 meters diameter circle area, black duct tape, form. Scorers, Ball-points/Pencils, Whistles and Stopwatches.
- Implementation instructions.
  - ✓ Testee stands behind the firing line, then testee shoots soaring.
  - ✓ Tes The ball must pass through a barrier that is 2 meters high.
  - ✓ Chipping Test The place where the ball falls is the score obtained.
  - ✓ Do this activity alternately between the right and left legs 5 times each.
- How to Score
  - ✓ He place where the ball falls is the recorded score.
  - ✓ Balls that do not fall in the target area do not cross the score line do not count.
  - ✓ Balls that go out of the target area do not count. An illustration of the test can be seen in the image below.

After making improvements based on input and suggestions from expert validators, then product trials are carried out on small and large scales. Small-scale trials were carried out on 2 futsal teams of the Provincial Sports Week with 15 players aged 18-23 years each, namely the futsal teams of Surakarta and Karanganyar Regency, while the large-scale trials were carried out by 90 players from 6 teams of the Provincial Sports Week, namely Banyumas Regency, Klaten Regency, Kebumen Regency, Kendal Regency, Kudus Regency and Jepara Regency. The validity and reliability test was carried out with the help of analysis on SPSS 25 using product moment and cronbach alpha correlation tests. These results can show that from small-scale trials, the initial product was declared to have high validity and reliability in a small group, namely futsal players of the Surakarta and Karanganyar Provincial Sports Week. The results can show that from small-scale trials, the initial product was declared to have high validity and reliability in the Surakarta City Provincial Sports Week team and Karanganyar Regency.

Table 1. Validity and Reliability Test on a Small Scale of the Surakarta City and Karanganyar Regency Provincial Sports Week Team on Test Control

Product Moment Validity Test				
Test	Techniques Control	R_{count}	Probability	Information
1	Test	0,974	0,000	Valid
2	Retes	0,972	0,000	Valid
Cronbach Alpha Reliability Test				
	Control	0.806	0.000	Reliable

The table above shows the results of the product validity test on a small scale for test control with a probability value of < 0.05. The results can show that from a small-scale trial, the initial product was declared valid and reliable in the Surakarta City and Karanganyar Regency Provincial Sports Week teams.

Table 2. Validity and Reliability Test on a Small Scale of the Provincial Sports Week Team of Surakarta City and Karanganyar Regency on the Chipping Test

Product Moment Validity Test				
Test	Techniques Chipping	R_{count}	Probability	Information
1	Test	0,994	0,000	Valid
2	Retes	0,992	0,000	Valid
Cronbach Alpha Reliability Test				
	Control	0.978	0.000	Reliable

The table above shows the results of the product validity and reliability test on a small scale for the chipping test has a probability value of < 0.05. The results can show that from a small-scale trial, the

initial product was declared valid and reliable in the Surakarta City and Karanganyar Regency Provincial Sports Week teams.

Table 3. Validity and Reliability Test on a Large Scale Central Java Provincial Sports Week Team on Test Control

Product Moment Validity Test				
Test	Techniques Control	R_{count}	Probability	Information
1	Test	0,973	0,000	Valid
2	Retes	0,967	0,000	Valid
Cronbach Alpha Reliability Test				
	Control	0.935	0.000	Reliable

The table above shows the results of product validity tests on a large scale for test control with a probability value of < 0.05. These results can show that from the large-scale trial, the initial product was declared valid and reliable in the Central Java Provincial Sports Week team.

Table 4. Validity and Reliability Test on a Small Scale Central Java Provincial Sports Week Team in the Chipping Test

Product Moment Validity Test				
Test	Techniques Chipping	R_{count}	Probability	Information
1	Test	0,975	0,000	Valid
2	Retes	0,967	0,000	Valid
Cronbach Alpha Reliability Test				
	Control	0.935	0.000	Reliable

The table above shows the results of the product validity and reliability test on a large scale for the chipping test has a probability value of < 0.05. These results can show that from large-scale trials, the initial product was declared valid and reliable in the Central Java Provincial Sports Week team.

Discussion

The results of the study show that the level of validity and reliability that has been carried out on a small scale and on a large scale using basic shooting and passing techniques already has a high level of validity and reliability. The validity of the instrument reflects the extent to which the test is able to accurately measure the ability in question, while reliability ensures that measurements can provide consistent results even when performed under a variety of conditions and times. Based on the tests carried out, both on a small scale and on a large scale, this instrument has successfully shown superior performance in both aspects.

In the validity test, data analysis showed that each item in the instrument had a significant correlation with the basic shooting and passing abilities of futsal players. This proves that the test is in line with the purpose of measurement and can provide relevant results for evaluating a player's skills. In addition, the reliability of the instruments tested through the test-retest method also produces a very high reliability coefficient value, indicating that the test results are consistent and reliable. This consistency is very important, especially in the context of coaching U-23 players, where data accuracy is the cornerstone for designing an effective training program.

The success of this instrument in meeting the criteria of validity and reliability makes an important contribution to the development of futsal athlete coaching. With a standard measuring tool, coaches can obtain objective data on players' abilities, making it easier to evaluate performance and plan training strategies. Furthermore, this instrument is not only relevant for use in Central Java Province but also has the potential to be adopted more widely in futsal coaching at the national level. The results of this study are proof that the development of instruments based on a scientific approach can produce high-quality measuring instruments, while supporting systematic and sustainable improvement of player performance.

This finding has significant implications in supporting data-based futsal coaching. The instrument developed not only makes it easier for coaches to evaluate player performance, but also allows for the implementation of a more targeted and efficient training program. With proven validity and reliability,

this instrument has the potential to become a standard for evaluating basic futsal skills at the regional and national levels. According to (Keshvari & Senner, 2015) valid and reliable tests can produce accurate data. This is in line with the opinion (Varkiani et al., 2013) of the accuracy of research tools on the concepts assessed so that they really assess according to what is assessed. This is in line with (Matzenbacher et al., 2014) who said that the reliability of a test shows the accuracy or consistency of measurement results. A measuring device or test is said to be reliable if it produces a truly trustworthy and reliable picture. Validity is the level of validity of a test that can provide an accurate and careful description of a test. From the results of the analysis and processing of validity test data, it shows a good level of validity for the futsal skills test, while reliability is the level of validity of a test.

According to (Barcelos et al., 2017) the assessment scale can be used as a valid measurement tool to measure various types of goals in physical education, especially when the outcome target prioritizes the terminology of the process rather than the product. So it can be concluded that a study that focuses on the implementation process can use the assessment scale as an instrument of measurement. In physical education and sports, the research conducted can observe the process of implementing movement activities. Because the main subject of research in the world of sports is the movement of humans. Meanwhile, according to (Naser et al., 2017) it is stated that the measurement criteria are said to be good if they meet the criteria: the measurement instrument must be valid, reliable, easy to administer and there are assessment norms. The basic futsal technique test instrument developed will require an assessment of the final result. For the selection of the type of assessment scale used, it is adjusted to the data collection method and the desired purpose. The selection of this form is based on the criteria of the type of assessment scale that is in accordance with the research implementation mechanism and the subjects to be compared. The implications of this study are based on the importance of efforts to improve control and chipping skills in futsal games, especially in professional players. This is because basic skills of control and chipping are basic movements that are very urgent to apply. If the player has poor control or chipping skills, it will be easy for the enemy to master the game. So it is important for professional coaches to be able to understand how to improve the quality of professional players by making various efforts to modify training to be able to achieve the desired goals. In addition, the researcher hopes that this research can be developed widely so that this research can have benefits for the whole world, especially for futsal coaches and athletes.

Conclusions

The test instrument developed to measure the basic shooting and passing skills of U-23 futsal players has a high level of validity and reliability. The validity of the instrument proves that the test is capable of measuring capabilities accurately and relevantly, in accordance with the purpose for which the measurement was designed. Meanwhile, the reliability of the instrument shows consistency of measurement results, both when tested on a small and large scale, as well as under a variety of conditions and times. These two aspects make the test instrument developed as an objective and reliable measuring tool in coaching futsal athletes. This instrument is not only relevant for individual performance evaluation needs but also provides significant benefits for coaches in designing more effective and targeted training programs. With accurate data, coaches can identify players' strengths and weaknesses, as well as provide specific feedback for skill development. Overall, this research makes a meaningful contribution to the development of science-based measuring tools to support the development of more professional and sustainable futsal athletes.

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References

Bafirman, Munir, A., Zarya, F., & Nia, T. A. (2023). Comparison of Learning Methods Based on Animals Name and Conventional Learning to Improve Free Throw Shooting Skills in Basketball Games. International Journal of Human Movement and Sports Sciences, 11(5), 1150–1157. https://doi.org/10.13189/saj.2023.110524

Barcelos, R. P., Tocchetto, G. L., Lima, F. D., Stefanello, S. T., Rodrigues, H. F. M., Sangoi, M. B., Moresco, R. N., Royes, L. F. F., Soares, F. A. A., & Bresciani, G. (2017). Functional and biochemical adaptations of elite level futsal players from Brazil along a training season. Medicina (Lithuania), 53(4), 285–293. https://doi.org/10.1016/j.medici.2017.08.001

Dal Pupo, J., Detanico, D., Arins, F. B., Nascimento Salvador, P. C., Guglielmo, L. G. A., & dos Santos, S. G. (2017). Capacidade de sprints repetidos e níveis de potência muscular em jogadores de futsal das categorias sub 15 e sub 17. Revista Brasileira de Ciencias Do Esporte, 39(1), 73–78. https://doi.org/10.1016/j.rbce.2016.01.010

de Oliveira, R. S., Borin, J. P., Fernandes, P. T., Uchida, M. C., & Borges, T. de O. (2019). Description of 18 weeks integrated training on the displacement speed in Brazilian futsal players. Revista Brasileira de Ciencias Do Esporte, 41(3), 308–313. https://doi.org/10.1016/j.rbce.2018.06.001

Hara, A., Yokoyama, M., Ichihara, S., & Maruyama, Y. (2020). Treatment of an intraarticular comminuted fracture of the base of the proximal phalanx in a ring finger using the Ichi-Fixator external fixator system: A case report. International Journal of Surgery Case Reports, 68, 12–17. https://doi.org/10.1016/j.ijscr.2020.02.020

Ismail, S. I., Sulaiman, N., & Adnan, R. (2016). The Most Utilized Rotation and Translation Movement while in Ball-Possession among Futsal Players. Procedia Engineering, 147, 116–121. https://doi.org/10.1016/j.proeng.2016.06.199

Keshvari, B., & Senner, V. (2015). Comparison of shoe-surface tractions on various playing surfaces in futsal. Procedia Engineering, 112, 267–272. https://doi.org/10.1016/j.proeng.2015.07.245

Matzenbacher, F., Pasquarelli, B. N., Rabelo, F. N., & Stanganelli, L. C. R. (2014). Physiological demands of futsal competition. Physical and physiological characteristics of professional players. Revista Andaluza de Medicina Del Deporte, 7(3), 122–131. https://doi.org/10.1016/S1888-7546(14)70074-7

Müller, E. S., da Costa, I. T., & Garganta, J. (2018). Tactical analysis in futsal: comparative study of performance by players from four age levels. Revista Brasileira de Ciencias Do Esporte, 40(3), 248–256. https://doi.org/10.1016/j.rbce.2016.01.015

Naser, N., Ali, A., & Macadam, P. (2017). Physical and physiological demands of futsal. Journal of Exercise Science and Fitness, 15(2), 76–80. https://doi.org/10.1016/j.jesf.2017.09.001

Nia, T. A., Nasrulloh, A., Nugroho, S., & Munir, A. (2023). The Contribution of Limb Muscle Power Components, Leg Length, and Pelvic Flex to Dollyo Chagi's Kick Lampung Taekwondo Athlete. International Journal of Human Movement and Sports Sciences, 11(5), 1028–1035. https://doi.org/10.13189/saj.2023.110511

Nogueira, F. C. d. A., de Freitas, V. H., Nogueira, R. A., Miloski, B., Werneck, F. Z., & Bara-Filho, M. G. (2018). Mejora del rendimiento físico, perfil hormonal, balance estrés-recuperación y aumento del daño muscular basado en la planificación específica de pretemporada en el fútbol sala. Revista Andaluza de Medicina Del Deporte, 11(2), 63–68. https://doi.org/10.1016/j.ramd.2015.11.008

Rezaimanesh, D., Amiri-Farsani, P., & Saidian, S. (2011). The effect of a 4 week plyometric training period on lower body muscle EMG changes in futsal players. Procedia - Social and Behavioral Sciences, 15, 3138–3142. https://doi.org/10.1016/j.sbspro.2011.04.260

Rinaldo, M. A., de Souza, E. G., da Silva, K. A., Cardoso, P. C., Milanez, V. F., & de Paula Ramos, S. (2022). Contextual situations in competitions that influence well-being and recovery of Futsal athletes before home official matches. Apunts Sports Medicine, 57(214). https://doi.org/10.1016/j.apunsm.2022.100385

Spyrou, K., Alcaraz, P. E., Marín-Cascales, E., Herrero-Carrasco, R., Pereira, L. A., Loturco, I., & Freitas, T. T. (2022). Injury rates following the COVID-19 lockdown: A case study from an UEFA futsal champions league finalist. Apunts Sports Medicine, 57(213), 0–3. https://doi.org/10.1016/j.apunsm.2021.100377

Teunissen, J. W. (AJW), ter Welle, S. (SEW), Platvoet, S. (SWJ), Faber, I., Pion, J., & Lenoir, M. (2021). Similarities and differences between sports subserving systematic talent transfer and development:

The case of paddle sports. Journal of Science and Medicine in Sport, 24(2), 200–205. https://doi.org/10.1016/j.jsams.2020.09.005

Tienza-Valverde, A., Hernández-Beltrán, V., Espada, M. C., Bravo-Sánchez, A., Santos, F. J., & Gamonales, J. M. (2023). Analysis of individual performance indicators of football goalkeeper. Apunts Sports Medicine, 58(219). https://doi.org/10.1016/j.apunsm.2023.100420

Varkiani, M. E., Alizadeh, M. H., & Pourkazemi, L. (2013). The Epidemiology of Futsal Injuries Via Sport Medicine Federation Injury Surveillance System of Iran in 2010. Procedia - Social and Behavioral Sciences, 82, 946–951.
https://doi.org/10.1016/j.sbspro.2013.08.001

Villanueva-Guerrero, O., Lozano, D., Roso-Moliner, A., Nobari, H., Lago-Fuentes, C., & Mainer-Pardos, E. (2024). Effects of different strength and velocity training programs on physical performance in youth futsal players. Heliyon, 10(10), e30747. https://doi.org/10.1016/j.heliyon.2024.e30747

Yoshida, K., Tateishi, T., & Morimoto, Y. (2023). Futsal injuries: A 7-season incidence and characteristics. JSAMS Plus, 2(December 2022), 100027. https://doi.org/10.1016/j.jsampl.2023.100027

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