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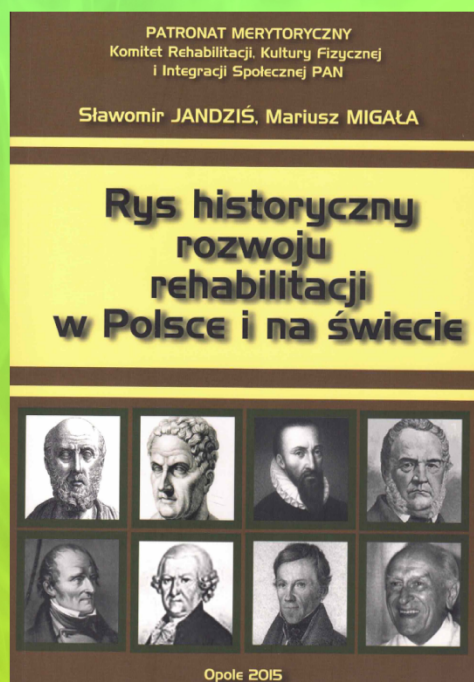
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# Effects of FIFA 11+ program on speed, body balance and leg muscle power to prevent injury among football club university player

*Wpływ programu FIFA 11+ na szybkość, równowagę ciała i siłę mięśni nóg stworzonego w celu zapobiegania urazom wśród zawodników uniwersyteckiego klubu piłkarskiego*

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## Abstract

**Introduction.** Football is the most popular sport in Indonesia. In a football match, the game lasts 2 x 45 minutes. However, football players are often injured due to collisions and errors in landing after jumping. Some factors that increase the occurrence of injuries are poor leg muscle power, poor balance, and poor running speed. FIFA created FIFA 11+ as a training program to guard against sports-related injuries to football players. However, although there has been quite a lot of research related to the FIFA 11+ training program in Indonesia, there still needs to be more research on the provision of the FIFA 11+ training program. **Purpose.** This study aims to determine the effect of the FIFA 11+ training program on body balance, speed, and leg muscle power. **Methods.** This experimental study has a one-group pretest and posttest design. The research was conducted at the Muhammadiyah University Football Club in Purwokerto, Indonesia. The population sample consists of 42 boys between the ages of 18 and 23. FIFA 11+ practice is provided over 4 weeks (2 sessions in 1 week). The data obtained was then tested for Pearson product-moment correlation and multiple regression correlation tests using the Statistical Product and Service Solutions (SPSS) application version 26. **Results.** The results showed that after the FIFA 11+ training program, there was a significant increase in body balance, lower leg muscle power, and speed. This was proven in the effect test, with SPSS showing results of  $p < 0.05$ . **Conclusion.** Based on the results and discussion above, the FIFA 11+ program significantly increases body balance, leg muscle power, and running speed.

## Keywords

FIFA 11+, Leg Muscle Power, Body Balance, Speed, Injury

## Streszczenie

**Informacje wprowadzające.** Piłka nożna jest najpopularniejszym sportem w Indonezji. W meczu piłki nożnej gra trwa 2 x 45 minut. Piłkarze często doznają kontuzji w wyniku kolizji i błędów w lądowaniu po skoku. Niektóre czynniki zwiększające występowanie urazów to słaba siła mięśni nóg, słaba równowaga i niska prędkość biegu. FIFA stworzyła FIFA 11+ jako program treningowy chroniący piłkarzy przed kontuzjami. Jednak chociaż w Indonezji przeprowadzono już sporo badań związanych z programem treningowym FIFA 11+, nadal potrzebne są badania dotyczące realizacji programu szkoleniowego FIFA 11+. **Cel.** Niniejsze badanie ma na celu określenie wpływu programu treningowego FIFA 11+ na równowagę ciała, szybkość i siłę mięśni nóg. **Metody.** W ramach badania jedna grupa została poddana testom przed i po zrealizowaniu interwencji. Badania przeprowadzono w klubie piłkarskim Muhammadiyah University Football Club w Purwokerto w Indonezji. Próba populacji składała się z 42 chłopców w wieku od 18 do 23 lat. Trening FIFA 11+ odbywał się przez 4 tygodnie (2 sesje w tygodniu). Uzyskane dane zostały następnie przeanalizowane pod kątem korelacji momentu iloczynu Pearsona i korelacji regresji wielokrotnej przy użyciu aplikacji Statistical Product and Service Solutions (SPSS) w wersji 26. **Wyniki.** Wyniki pokazały, że po zastosowaniu programu treningowego FIFA 11+ nastąpił znaczny wzrost równowagi ciała, siły mięśni podudzi i szybkości. Zostało to potwierdzone w teście, gdzie wyniki w aplikacji SPSS wyniosły  $p < 0,05$ . **Wniosek.** Na podstawie powyższych wyników i omówienia, program FIFA 11+ znacznie zwiększa równowagę ciała, siłę mięśni nóg i szybkość biegu.

## Słowa kluczowe

FIFA 11+, siła mięśni nóg, równowaga ciała, prędkość, kontuzje

## Introduction

Football is a sport that has been played globally for a significant amount of time, its popularity spans all strata of society [1]. Football is a team sport that is already well-known in a variety of different communities and settings. The sport of football is played by 11 primary players and several reserve players for each team. Each game of football takes a relatively long amount of time, consisting of two halves of 45 minutes each, because there are 11 primary players on each team. In addition to that, there is a rest period that lasts for approximately 15 minutes after the first half of the match, which lasts for 45 minutes, and injury time, which lasts for approximately it is often given more than 1 minute by a referee in every match if in a match there is frequently a stoppage of time due to various factors that occur [2]. If the two teams continue to have an even score after the extra time has been carried out to determine who the winner of the match is, then there will be a penalty shootout to determine the victor in the match. The referee will determine the winner of the match based on the results of the penalty shootout if there is still a tie score after the extra time has been carried out [3].

In addition, because football is such a contact sport, players put themselves at a greater risk of getting hurt than in other sports [4]. A player is much more likely to sustain an injury while playing in an actual football match than getting hurt during practice. Sprains and strains of the lower extremities and thighs account for the vast majority of injuries that occur both in the match and in practice [5]. When playing football, players run the risk of injuring their hamstrings, quadriceps, knee ligaments, and ankles, among other parts of their bodies. Injury prevention strategies are also of the utmost significance during high-load weekly macrocycles, such as competitive seasons, which are the times when injuries are most likely to occur [6]. It is common knowledge that the required number of practices varies not only based on the age group, practice day, practice week, and position players but also on the length of the season. Static balance, dynamic balance, and leg muscle power can all be improved through the performance of various exercises and the adjustment of many variables [7].

The prevention of injuries to football players can be accomplished through a variety of methods, including the following: 1) Proper Warm-up: It is imperative to perform an extensive warm-up in order to get the body ready for physical activity. By increasing the amount of blood that flows through the muscles, warming up helps lower the risk of muscle strains and sprains [8]; 2) Conditioning: A well-designed conditioning program can help a player become more physically fit overall while also lowering the player's risk of injury. In order to increase their strength, stamina, and agility, players should engage in strength training as well as cardiovascular exercises [9]; 3) Technique: Technique is the most important factor in determining whether or not a player will sustain an injury while playing football. Tackling, blocking, and the myriad of other skills needed for football should be taught to the players in the proper manner [10]; 4) Injury Prevention Programs: In order to reduce the likelihood of injuries occurring, some teams implement injury prevention programs that concentrate on improving flexibility and strengthening particular muscle groups [11].

The FIFA Medical Assessment and Research Center (F-MARC) developed a program routine called FIFA 11+ to cut down on the number of players who end up getting injured. The results of a number of studies indicate that the FIFA 11+ program has a beneficial effect on athletes by reducing the likelihood of injury, increasing the athletes' level of performance, and improving their physical attributes [12]. The exercises that make up the motion-based warm-up training program are each carried out for no more than twenty minutes. These motions emphasize three distinct facets of education, namely: 1) three exercises that concentrate on the unilateral and dynamic stability of the lower extremities; 2) three exercises that concentrate on the strength of the entire body; and 3) one exercise that concentrates on the proper technique for falling [13].

Several studies have been conducted to assess how effective FIFA 11+ is as a method of preventing injuries among football players. Additionally, knowing the extent to which FIFA 11+ enhances athlete performance is essential for minimizing the risk of injury and making the most of one's time spent participating in sports. Investigate the efficacy of the FIFA 11+ program in warding off injuries suffered by football players of both sexes. The performance of athletes is another area that will be investigated as part of this research project. There are a number of factors that contribute to a football player's performance, including their muscle strength, sprint speed, jump height, balance, and proprioception. The primary purpose of this investigation was to ascertain whether or not teams ought to make use of the FIFA 11+ training program during their respective training sessions. The application of this research in the real world is absolutely necessary because there is a significant risk of injury in football, particularly to the leg. The fact that these injuries are primarily caused by variables that can be controlled lends credence to the idea that a warm-up routine is very important. The suggestion made by the FIFA 11+ program for this initiative to be simple to carry out and to involve all players works hand in hand with this idea.

## Method

### Study design

The quasi-experimental study with one group pretest and post-test design was designed to analyze the effect of the four-week FIFA 11+ program on speed, static and dynamic balance and leg muscle power in football club university player. Before football training, the participants perform the FIFA 11+ program for 20 min each session for 16 sessions a month. This study aimed to determine the effects of FIFA 11+ program on speed, body balance, leg muscle power to prevent injury in football players who were members of the Muhammadiyah Purwokerto University Football Club. This investigation occurred on the football pitch at Muhammadiyah Purwokerto University in January 2023.

### Participants

For this study, the population consisted of individuals who participated in football. The participants in this study all played football for the Muhammadiyah Purwokerto University Football Club, so the sample size for this research was 42 people. There are the criteria for the sample: 1) currently participating in foot-

ball at the Muhammadiyah Purwokerto University Football Club; 2) being in good physical and mental health; 3) being willing to take the test; 4) already to follow the FIFA 11+ program and 5) having completed a BMI check, speed test, static balance test, dynamic balance test, and vertical jump test.

The Purwokerto Muhammadiyah University Football Club was selected as the subject of the investigation by the researchers because, of all the clubs in Banyumas, this University Football Club was the one with the most notoriety. As a direct consequence of this, it was selected to go up against other universities and represent the region in 2013 at the National Football Championship for Universities.

### Ethical considerations

The research ethics committee of the Faculty of Medicine Uni-

versitas Islam Sultan Agung, Semarang, Jawa Tengah has given approval to this study No. 359/X/2022/Bioethic Committee. Prior to conducting the research, the respondents had agreed and signed their consent to become research respondents after reading of the experimental methods.

### Outcome Measurement

Before the actual research was carried out, the participants were asked to fill out a questionnaire that included questions about their identities as well as their ages, heights, weights, and body mass index measurements. The formula for determining a person's body mass index is  $\text{kg/m}^2$ , which can be found in the BMI Calculator. This formula can be used to determine a person's BMI [14, 15]. Because of this, the data regarding BMI are utilized as supporting data for this study.

**Table 1. Body Mass Index Category [14]**

Category	Body Mass Index Score
Underweight	< 18.5
Normal	18.5-25
Overweight	25-30
Obesity	> 30

Speed measurement is evaluated by running a 50-meter sprint. This measurement has been very often found in previous studies. Some equipment needed to make this measurement is a stopwatch, a 50-meter straight running track, and a whistle. The implementation is the test carried out by running 50 meters with a standing start. Four respondents stood behind the start line after the "yes" command, and the respondents ran as fast as they could to the finish line. The test was carried out two times. The score is determined from the time obtained [16].

The stork balance test was utilized for the purpose of determi-

ning participants' static balance in this study. The Standing Stork Test, also known as the one leg stand or simply standing on one leg, is a measurement tool that is used to test an athlete's ability to maintain static balance while standing on one leg with their eyes closed. When comparing the Standing Stork Test to other balance tests for the functional balance test, the Standing Stork Test is typically considered to be the "gold standard." When a person is 15 to 30 years old, they have the highest average of 26 to 39 seconds that they can stand on one leg [17].

**Table 2. Standing Stork Balance Test Rate [18]**

Category	Score (second)
Not enough	< 10
Enough	10-24
Average	25-39
Good	40-50
Very good	> 50

The Y-Balance Test is a dynamic balance test that requires strength, flexibility, core control, and proprioception. It is performed in a single-leg stance. It has been utilized in the evaluation of a person's physical performance, the demonstration of functional symmetry, and the identification of athletes who are at a greater risk of sustaining lower extremity injuries. This procedure is for the Lower Quarter version of the Y Balance test, which is described further below. The Upper

Quarter Y Balance Test is another test that evaluates the stability and balance of the upper body [19].

The vertical jump test is used to determine the leg muscle strength of an individual. The vertical jump test is a measure of the strength in the legs and lower body. The first description of this test was published nearly a century ago [20]. The method that is utilized to directly measure the height of a vertical jump is described in the procedure that follows.

Table 3. Vertical Jump Test Rate [21]

Category	Height (cm)
Not enough	< 10
Enough	10-24
Average	25-39
Good	40-50
Very good	> 50

### Intervention

In the warm-up program for FIFA 11+, the spatial orientation, anticipation, and perception parts of the game are emphasized. Especially when performing dual roles and attempting to avoid making accidental contact with other players or objects. Additionally, playing FIFA 11+ helps players improve their body stability and coordination of movement, in addition to teaching them the proper technique for falling when tackled. The ability to minimize the adverse effects and risks associated with unavoidable falls, such as injury, is one of the benefits of learning proper fall techniques [22]. Training your body for FIFA 11+ for an hour and 45 minutes every week. The recommended amount of FIFA 11+ physical training is.

Training Sessions 1 and 2, the frequency of exercise being twice a week with an intensity of 70% of HRMax, the type of aerobic exercise being performed for 45 minutes, 15 repetitions of movements being performed twice, and two sets. Exercise sessions 3, 4, and 5 are performed on a biweekly basis. The intensity of the workout is increased to 75% of the participant's maximum heart rate (HRMax), aerobic exercise is performed for 45 minutes, and there are 15 repetitions performed in each set. Exercise sessions 6, 7, and 8 will have a frequency of twice per week, an intensity of 80% of one's maximum heart rate (HRMax), an aerobic exercise type, 45 minutes of exercise time, 15 repetitions of each movement, and two exercise sets [23].

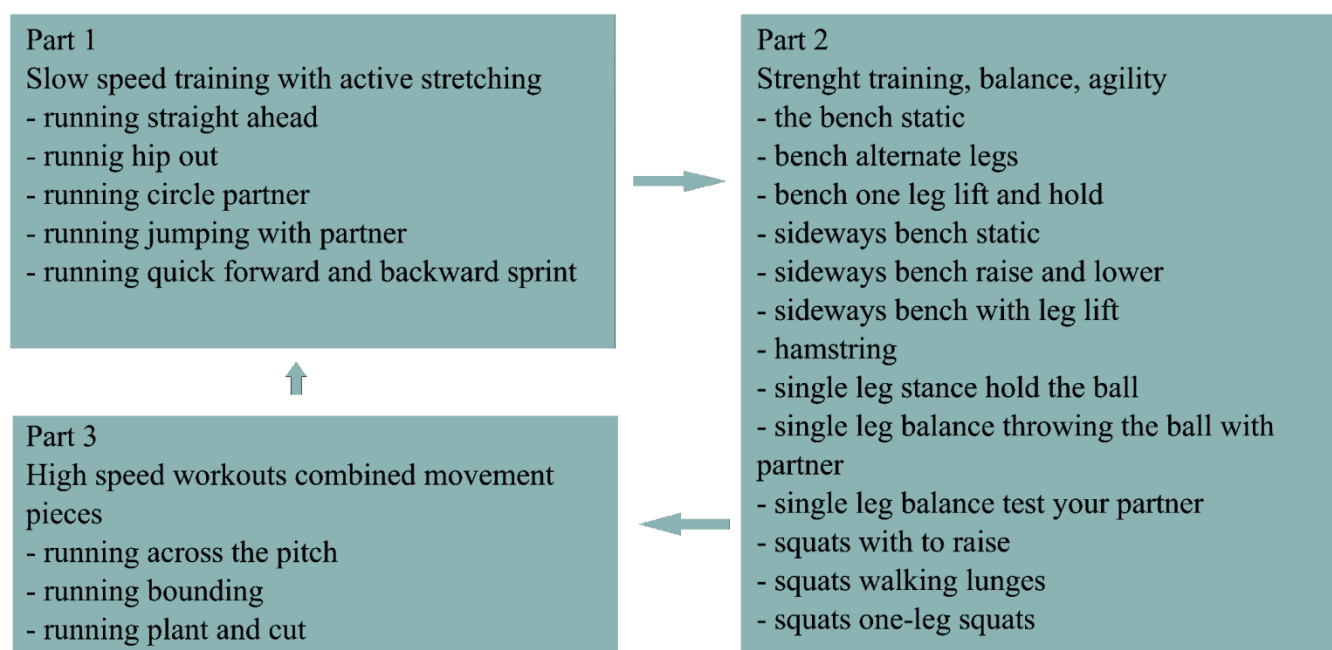


Figure 1. The FIFA 11+ program procedure [22]

### Data analysis

Windows Version 23 of the Statistical Program for the Social Sciences was used for the statistical analysis. The researchers started by performing a Levene test to determine whether or not the data were distributed consistently. The researchers then used

the Chi-Square test to evaluate the degree to which the data were distributed normally. Finally, a paired sample t-test was used by the researchers so that they could determine how playing FIFA 11+ affected a participant's speed, body balance, and the power of their leg muscles.

## Results

**Table 4. Age of sample population**

Age	Frequency	Percentage (%)
18	8	19%
19	10	23.8%
20	13	31%
21	6	14.2%
22	5	12%
<b>Total</b>	<b>42</b>	<b>100%</b>

There were 42 samples in total, and all of them were male. Between the ages of 18 and 22, inclusive. The sample of students aged 18 was comprised of 8 football players, the sample of students aged 19 comprised of 10 football players, the sample of students aged 20 comprised of 13 football players, the sample of students aged 21 comprised of 6 football players, and the sample of students aged 22 comprised of 5 football players. In the following table, which can be found below, you will see the vulnerable ages of the sample used in this study.

sed of 13 football players, the sample of students aged 21 comprised of 6 football players, and the sample of students aged 22 comprised of 5 football players. In the following table, which can be found below, you will see the vulnerable ages of the sample used in this study.

**Table 5. Body Mass Index Respondent**

Category	Frequency	%
Underweight	0	0%
Normal	40	95.2%
Overweight	2	4.8%
Obesity	0	0%
<b>Total</b>	<b>42</b>	<b>100%</b>

There were a total of 42 people who followed the BMI check. There were a total of 40 respondents football players who had a normal body mass index, and there were 2 respondents football

players who had an overweight body mass index. There was not a single respondent who fell into either of the extreme categories of obesity or underweight.

**Table 6. Result Standing Stork Balance Test**

Category	Pre		Post		p-value
	Freq	%	Freq	%	
Very less	0	0	0	0	0.021
Not enough	2	4.7%	0	0	
Pretty good	22	52.4%	10	23.8%	
Good	11	26.2%	19	45.2%	
Very good	7	16.7	13	31%	
<b>Total</b>	<b>42</b>	<b>100%</b>	<b>42</b>	<b>100%</b>	

The standing stork balance test was used to obtain the testing results, which were then analyzed during the pretest. 2 football players were ranked as having not enough balance, 22 were ranked as having pretty good balance, 11 were ranked as having good balance, and 7 were ranked as having very good balance. There was an increase in the results of the posttest standing stork balance test scores after being given the FIFA 11+

physical training program. 0 football players had a balanced level of not enough, 10 players in the category of pretty good, 19 in the category of good, and 13 in the category of very good. With a significance level of  $p = 0.021$  ( $p < 0.05$ ), the paired sample t-test reveals that the FIFA 11+ training program increases the statistical balance. The hypothesis supports this finding.

**Table 7. Result Y Balance Test Score**

Side	Move	Pretest (cm)	Posttest (cm)	Difference (cm)	p-value
Right	Anterior	78.23	91.66	13.43	0.012
	Posteromedial	96.16	103.81	7.65	0.032
	Posterolateral	101.43	114.51	13.08	0.011
	Composite	93.33	103.45	10.12	0.017
Left	Anterior	75.31	90.52	15.21	0.010
	Posteromedial	94.87	103.15	8.28	0.028
	Posterolateral	102.34	115.13	12.81	0.011
	Composite	92.24	104.43	12.19	0.014

According to the results of the pre-test and the post-test for the dynamic balance check that was performed using the Y Balance Test. When comparing the results of the pre-test and post-test on anterior movement on the right side, there is a difference of 13.43 cm. The results of the pre- and post-tests show a difference of 7.65 centimeters with regard to the right side posteromedial movement. A difference of 13.08 centimeters can be seen between the pre- and post-test results when it comes to the right side posterolateral movement. The results of the pre-test and post-test both show a difference of 10.12 centimeters in the composite movement on the right side. Due to the fact that the results of the influence test obtained  $p < 0.05$ , it can be concluded that the pro-

vision of FIFA 11+ program significantly improved the dynamic balance of football players.

When comparing the results of the pre-test and post-test for anterior movement on the left side, there is a difference of 15.21 cm. The difference between the results of the pre-test and the post-test for the posteromedial movement on the left side is 8.28 cm. The difference in the results between the pre-test and the post-test for the posterolateral movement on the left side is 12.81 cm. When comparing the results of the pre-test and post-test on the left side of the composite movement, there is a difference of 12.19 cm. The provision of the FIFA 11+ training program was shown to have a significant effect on improving the dynamic balance of football players, as demonstrated by the results of the effect test, which obtained  $p < 0.05$ .

**Table 8. Result Vertical Jump Test Rate**

Category	Pre (cm)	Post (cm)	p-value
Below Average	0	0	0.00
Average	36	26	
Above Average	6	16	
Very Good	0	0	

The vertical jump test measures the explosive power of the lower leg muscles. Measurements were made in 2 sessions, namely before being given the FIFA 11+ training program and after the FIFA 11+ training program. Before the FIFA 11+ training program was given, 36 football players were in the average category, and 6 were in the above average category. However, after the provision of the FIFA 11+ training program,

the number of football players who fell into the average category decreased to 26 players, and the number of football players who entered the above-average category increased to 16 players. Furthermore, the influence test results using the paired sample t-test also have a significance value (p-value) of 0.00. Therefore, the FIFA 11+ training program can increase the explosive power of leg muscles in football players.

**Table 9. Result Average Speed Test Rate**

Pre (Second)	Post (Second)	p-value
6.35	5.87	0.01

After doing some balance and leg muscle power tests, the football players do a speed test. The speed test uses the 50-meter sprint method. This test was carried out two times, namely before the football players joined the FIFA 11+ training program and after participating in the FIFA 11+ training program. The research results showed that the pretest found that the average speed of football players at university clubs was 6.35 seconds.

However, after being given the FIFA 11+ training program, the time taken was faster, namely 5.87 seconds to run 50 meters. These results were then tested for influence, which was  $p = 0.01$ . Therefore, it can be concluded from these results that the provision of the FIFA 11+ training program significantly increases the running speed of football players in university clubs.

## Discussion

The findings of this research project indicate that participating in program training FIFA 11+ for a duration of four weeks can significantly improve various aspects of physical fitness that were measured in the study. Aspects such as body balance, speed, and leg power are included in this category. Football, which is widely regarded as the most dominant lower-extremity action sport, is thought to benefit from this boost in terms of supporting player performance [24].

A significant increase in leg muscle power was observed among the participants in this study, as demonstrated by the finding that  $p < 0.05$  was significant. This enhancement provides support for fundamental football movements, such as kicking, dribbling, and running at high speed. The power of one's leg muscles is absolutely necessary for the sport of football, particularly in terms of one's ability to kick. Studies have shown a positive correlation between the power of the leg muscles and the speed of the ball when attempting free kick approaches as well as instep kicks [25]. This correlation holds true in spite of the fact that there are many different types of kicks. In addition, there are anywhere from 1400 to 1600 different sprints and directional changes that take place during the course of a football game [26]. For this reason, having a strong lower body is essential for both agility and running repeated sprints while changing directions. In addition, having strong leg muscles can help lower the likelihood of sustaining an injury while participating in a sport, particularly one that involves a collision or an incorrect landing position [27].

A p-value of less than 0.05 indicated that the participants in this study experienced a significant improvement in their overall balance after receiving FIFA 11+ program training. After receiving the FIFA 11+ program, the static and dynamic balance will improve. Increased leg strength, particularly in the lower legs, can help improve body balance [28]. When it comes to the avoidance of injuries, a football player's ability to maintain a balance between the strengths of their various muscles is of the utmost importance [29]. The ratio of hamstring strength to quadriceps strength is an important factor in determining the likelihood of injury to the lower extremities [30]. Previous research has demonstrated that the comprehensive FIFA 11+ program is effective in increasing knee flexor strength and, as a consequence, the hamstring-to-quadriceps strength ratio [31]. There is a possibility that the force tension that is maintained between the presses is also important for releasing the lower leg. Interstitial limitations in eccentric knee flexor

strength have been shown to increase the risk of a hamstring injury, according to the findings of a prospective research study [32].

This research also demonstrates the results of a significant effect of training with the FIFA 11+ program on increasing a participant's speed with a p-value less than 0.05. The findings of this study are consistent with the findings of the research conducted by Bizzini [12]. The training for the FIFA 11+ program is an exercise that can increase the excitability of the nervous system, which in turn can increase the reactive ability of the neuromuscular system [33]. Myotatic stretch reflex can be stimulated to produce a more robust muscle response during running by performing exercises that concentrate on core stability, eccentric muscle, proprioception, and dynamic stabilization [34]. Every movement pattern that is practiced in the FIFA 11+ program includes a series of repeated stretch-shortening cycles. These cycles generate kinetic energy, which forces the neuromuscular system to react quickly in order to produce concentric contractions, which improve muscle performance while running. Muscles, tendons, and ligaments are all functionally strengthened during this exercise. This is accomplished in addition to repeated stretching and shortening cycles, which are used to train specific movements biomechanically [35].

Because of this, it is essential to emphasize that football is one of the sports that has the greatest level of participation all over the world. However, there is a significant risk of injury, particularly to the lower limbs, when engaging in this activity [29]. These injuries are almost always caused by modifiable factors, which highlights the significant part that the coaching staff plays in providing a training program for the team [36].

## Conclusion

As a result, these programs need to be simple to implement and include participation from all football players, which is consistent with the program that is being proposed for FIFA 11+. As a result of this, new research on this topic is required, and it should follow the recommendations of the FIFA 11+ program in order to determine its efficacy based on specific periods of utilization (frequency and duration) and the quality of training performance.

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## Piśmiennictwo/ References

1. O. G. M. Wijaya, M. Meiliana, and Y. N. Lestari, "The Importance of Nutritional Knowledge for Food Intake Optimization on Football Athletes," *Nutrizione*, vol. 01, no. 1, pp. 22–33, 2021.
2. I. S. Andi Ferianto, "Profil kondisi fisik atlet sepakbola ps hizbul wathan dalam menghadapi liga 2 indonesia," *J. Prestasi Olahraga*, vol. 4, no. 7, pp. 111–119, 2021.
3. O. Kolbinger and M. Stöckl, "Misbehavior during penalty kicks and goalkeepers holding the ball too long as trivial offenses in football," *Front. Psychol.*, vol. 10, no. MAR, pp. 1–7, 2019, doi: 10.3389/fpsyg.2019.00844.
4. H. T. Mai et al., "Performance-Based Outcomes after Anterior Cruciate Ligament Reconstruction in Professional Athletes Differ between Sports," *Am. J. Sports Med.*, vol. 45, no. 10, pp. 2226–2232, 2017, doi: 10.1177/0363546517704834.

5. J. Agel, T. A. Evans, R. Dick, M. Putukian, and S. W. Marshall, "Descriptive Epidemiology of Collegiate Men's Soccer Injuries: National Collegiate Athletic Association Injury Surveillance System, 1988 – 1989 Through 2002 – 2003," *J. Athl. Train.*, vol. 42, no. 2, pp. 270–277, 2007.
6. G. N. Bisciotti et al., "Hamstring Injuries Prevention in Soccer: A Narrative Review of Current Literature," *Joints*, vol. 07, no. 03, pp. 115–126, 2019, doi: 10.1055/s-0040-1712113.
7. M. A. Khan et al., "Physical and balance performance following exercise induced muscle damage in male soccer players," *J. Phys. Ther. Sci.*, vol. 28, no. 10, pp. 2942–2949, 2016, doi: 10.1589/jpts.28.2942.
8. K. Woods, P. Bishop, and E. Jones, "Warm-up and stretching in the prevention of muscular injury," *Sport. Med.*, vol. 37, no. 12, pp. 1089–1099, 2007, doi: 10.2165/00007256-200737120-00006.
9. T. Stølen, K. Chamari, C. Castagna, and U. Wisløff, "Physiology of soccer: An update," *Sport. Med.*, vol. 35, no. 6, pp. 501–536, 2005, doi: 10.2165/00007256-200535060-00004.
10. E. Schussler, R. J. Jagacinski, S. E. White, A. M. Chaudhari, J. A. Buford, and J. A. Onate, "the Effect of Tackling Training on Head Accelerations in Youth American Football," *Int. J. Sports Phys. Ther.*, vol. 13, no. 2, pp. 229–237, 2018, doi: 10.26603/ijsp20180229.
11. D. A. Padua et al., "National athletic trainers' association position statement: Prevention of anterior cruciate ligament injury," *J. Athl. Train.*, vol. 53, no. 1, pp. 5–19, 2018, doi: 10.4085/1062-6050-99-16.
12. M. Bizzini and J. Dvorak, "FIFA 11+: An effective programme to prevent football injuries in various player groups worldwide - A narrative review," *Br. J. Sports Med.*, vol. 49, no. 9, pp. 577–579, 2015, doi: 10.1136/bjsports-2015-094765.
13. M. I. Zein and Saryono, "The Effect of Short Period FIFA 11+ Exercise as Physical Conditioning Program Among Young Amateur Football Players," *Int. J. Hum. Heal. Sci.*, vol. 05, no. 02, pp. 207–212, 2021.
14. F. Q. Nuttall, "Body mass index: Obesity, BMI, and health: A critical review," *Nutr. Today*, vol. 50, no. 3, pp. 117–128, 2015, doi: 10.1097/NT.0000000000000092.
15. Syamsuryadin et al., "Correlation between Body Mass Index and Cardiovascular Fitness of Volleyball Athletes at Athletes Training Center during the Covid-19 Pandemic," *J. Med. Chem. Sci.*, vol. 5, no. 4, pp. 631–636, 2022, doi: 10.26655/JMCHMSCI.2022.4.19.
16. M. A. Dharmadi, "The Effects of 6-Week Training with Junior Weight Vest (JWV) for Arm Strength and Running Speed in Junior Martial Arts Athletes," *Int. J. Hum. Mov. Sport. Sci.*, vol. 10, no. 6, pp. 1107–1114, 2022, doi: 10.13189/saj.2022.100601.
17. K. McCurdy and G. Langford, "The relationship between maximum unilateral squat strength and balance in young adult men and women.," *J. Sports Sci. Med.*, vol. 5, no. 2, pp. 282–8, 2006, Online.. Available: <http://www.ncbi.nlm.nih.gov/pubmed/24260001%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid = PMC3827570>
18. O. Ogwumike and A. Tijani, "Balance Performance of Professional Footballers with Long-term Lower Limb Musculoskeletal Injury," *African J. Physiother. Rehabil. Sci.*, vol. 3, no. 1, pp. 23–27, 2011, doi: 10.4314/ajpr.v3i1.5.
19. P. J. Plisky, P. P. Gorman, R. J. Butler, K. B. Kiesel, F. B. Underwood, and B. Elkins, "The reliability of an instrumented device for measuring components of the star excursion balance test.," *N. Am. J. Sports Phys. Ther.*, vol. 4, no. 2, pp. 92–9, 2009, Online.. Available: <http://www.ncbi.nlm.nih.gov/pubmed/21509114%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid = PMC2953327>
20. G. Mascherini et al., "Can the vertical jump height measure the lower limbs muscle strength?," *Ital. J. Anat. Embryol.*, vol. 124, no. 1, pp. 107–112, 2019, doi: 10.13128/IJAE-25474.
21. C. P. McLellan, D. I. Lovel, and G. C. Gass, "The Role Of Rate Of Force Development On Vertical Jump Performance," *Strength Cond.*, vol. 25, no. 2, pp. 379–385, 2011.
22. S. Sumartiningih et al., "The FIFA 11+ for kids warm-up program improved balance and leg muscle strength in children (9–12 years old)," *J. Phys. Educ. Sport*, vol. 22, no. 12, pp. 3122–3127, 2022, doi: 10.7752/jpes.2022.12395.
23. Agustiyawan, S. Yani, and H. Wibisono, "FIFA 11+ Warm-Up Terhadap Peningkatan Speed Pada Pemain Sepak Bola," *J. Keperawatan Muhammadiyah*, vol. 7, no. 2, pp. 39–42, 2022.
24. K. Steffen, H. M. Bakka, G. Myklebust, and R. Bahr, "Performance aspects of an injury prevention program: A ten-week intervention in adolescent female football players," *Scand. J. Med. Sci. Sport.*, vol. 18, no. 5, pp. 596–604, 2008, doi: 10.1111/j.1600-0838.2007.00708.x.
25. M. Parmadi, S. A. Wigunani, A. S. Budi, W. Murtiansyah, and A. Susanto, "Correlation between Limb Muscle Exploitative Strength to Futsal Shooting Ability," *JUMORA J. Moderasi Olahraga*, vol. 2, no. 2, pp. 148–160, 2022, doi: 10.53863/mor.v2i2.533.
26. J. R. Silva, "The soccer season: performance variations and evolutionary trends," *PeerJ*, vol. 10, 2022, doi: 10.7717/peerj.14082.
27. B. P. Boden, F. T. Sheehan, J. S. Torg, and T. E. Hewett, "Non-contact ACL Injuries: Mechanisms and Risk Factors," *Am. Acad. Orthop. Surg.*, vol. 18, no. 9, pp. 520–527, 2010.
28. E. Grill, T. Ewert, B. Lipp, U. Mansmann, and G. Stucki, "Effectiveness of a community-based 3-year advisory program after acquired brain injury," *Eur. J. Neurol.*, vol. 14, no. 11, pp. 1256–1265, 2007, doi: 10.1111/j.1468-1331.2007.01963.x.
29. M. Buckthorpe, S. Wright, A. Virgile, and M. Gimpel, "Infographic. Recommendations for hamstring injury prevention in elite football: Translating research into practice," *Br. J. Sports Med.*, vol. 55, no. 12, pp. 699–700, 2021, doi: 10.1136/bjsports-2020-103455.
30. L. Ernlund and L. de A. Vieira, "Hamstring injuries: update article," *Rev. Bras. Ortop. (English Ed.)*, vol. 52, no. 4, pp. 373–382, 2017, doi: 10.1016/j.rboe.2017.05.005.
31. X. Zhou et al., "The Effect of FIFA 11+ on the Isometric Strength and Running Ability of Young Soccer Players," *Int. J. Environ. Res. Public Health*, vol. 19, no. 20, 2022, doi: 10.3390/ijerph192013186.
32. M. N. Bourne, D. A. Opar, M. D. Williams, and A. J. Shield, "Eccentric knee flexor strength and risk of hamstring injuries in rugby union," *Am. J. Sports Med.*, vol. 43, no. 11, pp. 2663–2670, 2015, doi: 10.1177/0363546515599633.
33. N. C. Barengo, J. F. Meneses-Echávez, R. Ramírez-Vélez, D. D. Cohen, G. Tovar, and J. Enrique Correa Bautista, "The impact of the fifa 11+ training program on injury prevention in football players: A systematic review," *Int. J. Environ. Res. Public Health*, vol. 11, no. 11, pp. 11986–12000, 2014, doi: 10.3390/ijerph111111986.
34. F. P. Matos et al., "Analysis of pain symptoms, flexibility and hydroxyproline concentration in individuals with low back pain submitted to Global Postural Re-education and stretching," *Pain Manag.*, vol. 10, no. 3, pp. 167–177, 2020, doi: 10.2217/pmt-2019-0053.
35. G. Davies, B. L. Riemann, and R. Manske, "Current Concepts of Plyometric Exercise.," *Int. J. Sports Phys. Ther.*, vol. 10, no. 6, pp. 760–86, 2015, Online.. Available: <http://www.ncbi.nlm.nih.gov/pubmed/26618058%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid = PMC4637913>
36. J. Ekstrand, M. Hägglund, and M. Waldén, "Epidemiology of muscle injuries in professional football (soccer)," *Am. J. Sports Med.*, vol. 39, no. 6, pp. 1226–1232, 2011, doi: 10.1177/0363546510395879.