

Research Article

The level of football analysis on the optimal development phase (Golden Age) of adolescents aged 13 to 17 years

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ABSTRACT

Football is one of the sports that can support physical, mental, and social development, especially during the optimal development period (golden age) of adolescents. This period, which occurs at the age of 13-17, is an important period in physical development and motor skills. This study aims to analyze the influence of football on the optimal development of adolescent girls in this age range. The study used the cross-cutting method by involving 60 adolescent girls who actively participated in football training at a football school in Central Java. The data collected included physical development (height, weight, and nutritional status based on BMI/age), motor development (balance, agility, and muscle strength), and social development (team interaction and confidence). The results showed that participation in football had a significant influence on physical ($p < 0.05$), motor ($p < 0.01$), and social ($p < 0.01$) development. This study concludes that football provides positive benefits during the optimal development period of adolescent girls, especially in physical, motor, and social aspects. Longitudinal studies with larger population coverage are needed to identify appropriate exercise strategies to maximize progression without increasing the risk of injury.

Keywords: Football; Golden Age; Physical Development; Motor Development; Adolescent Girls

1. INTRODUCTION

Adolescence, especially the age of 13–17 years, is known as the optimal developmental period or *golden age*. During this time, physical, cognitive, and social growth reaches its peak, allowing individuals to develop new skills more effectively. Soccer, as one of the most popular sports around the world, offers a unique combination of physical activity, teamwork, and character building that is crucial in adolescent development. As adolescent participation in sport increases, various studies have shown that team sports, including soccer, have a significant positive impact on adolescent holistic development. According to Anderson, Brown, and Garcia (2021) in *the Journal of Sports Science*, team sports not only improve physical health but also contribute to social and emotional development. Participation in football can improve communication skills, confidence, as well as the ability to work together in a team, which is an important element in their social and professional lives in the future.

In addition, research by Garcia, Thompson, and Wilson (2019) in *the Psychology of Sport and Exercise* shows that soccer plays a role in reducing stress and anxiety levels in adolescents. Regular physical activity helps in the release of endorphins, which contribute to improved mental well-being. What's more, for teenage girls who often face social barriers in sports, soccer can be an effective tool for building confidence and coping with social pressures they may face. From the physical aspect, Jones and Smith (2017) in *Social Sport Studies* report that regular soccer training can strengthen muscles, increase endurance, and help bone growth and motor coordination. This is in line with the findings of Wilson (2018) in *the Journal of Gender and Sport*, which states that participation in football can help lower the risk of obesity and improve an active lifestyle in adolescent girls. These benefits are becoming increasingly important given the increasing rates of obesity in adolescents in different countries, which can lead to a variety of long-term health problems.

Furthermore, research by Steinberg (2014) in his book *Adolescence* highlights that structured physical activity, such as football, not only supports physical health but also improves cognitive function. This activity helps in the development of critical thinking skills, decision-making, as well as the ability to deal with pressure in competitive situations. Thus, football can be an effective means of building character and mental resilience in young women. Other benefits of soccer are also seen in a study conducted by Miller et al. (2020) in *the International Journal of Adolescent Health*. They found that team sports

can help improve communication skills, strengthen interpersonal relationships, and build a sense of belonging within the group. In addition, research by Carter and McKenzie (2022) in *Youth Sports Review* states that involvement in football can help form a more positive mindset, stronger mental resilience, and better problem-solving skills in daily life.

Despite the many benefits offered, the participation of young women in football still faces various obstacles. Social and cultural factors are often the main barriers, including gender norms that limit their access to adequate sports facilities. Wilson (2018) revealed that many sports institutions still do not provide facilities that support the optimal participation of adolescent girls, such as proper locker rooms and access to professional coaches who are experienced in handling female athletes. In addition, a study by Roberts and King (2021) in *the Gender and Sports Journal* shows that negative stereotypes about gender roles in sports can reduce the motivation of adolescent girls to participate in football. In addition to structural barriers, psychological barriers are also a factor limiting the participation of adolescent girls in football. Research by Lee et al. (2021) in the *Journal of Youth Sports Psychology* found that many teenage girls feel less confident in a male-dominated sports environment. This factor is compounded by the lack of representation of women in sports coaching and leadership, which can affect their perception of opportunities in this field.

Based on this background, this study aims to analyze the influence of football on the physical, motor, and social development of adolescent girls aged 13–17 years. By understanding the benefits and barriers that exist, it is hoped that the results of this study can provide a deeper insight into the importance of sport in supporting the optimal development of adolescents and identify strategies that can be applied to increase the participation of adolescent girls in football. In addition, this research can also provide recommendations to policy makers, sports institutions, and the community in creating a more inclusive environment for adolescent girls to participate in football.

2. RESEARCH METHOD

The design of this research is descriptive and analytical with quantitative and qualitative approaches. This approach is used to understand in depth how football contributes to the physical, mental, and social development of adolescent girls aged 13-17 in Desminore. According to Creswell (2023), the design of analytical descriptive research aims to provide a systematic overview of the observed phenomenon and analyze the relationship between existing variables. A quantitative approach is used to measure the influence of football on physical aspects such as fitness, muscle strength, and heart and lung health. In addition, this method is also used to evaluate the level of confidence, life satisfaction, and social relationships that can be measured through a structured questionnaire distributed to participants. The quantitative data analysis technique was carried out using descriptive and inferential statistical tests to determine the significance of the relationship between participation in football and the physical and psychosocial development of adolescent girls. A qualitative approach is used to dig deeper into the subjective experiences of adolescent girls involved in football. In-depth interviews with athletes, coaches, and parents aim to understand their perspectives on the benefits and challenges faced in participating in the sport. Direct observation on the field is carried out to observe social dynamics and team interaction in the context of training and matches. According to Yin (2023), the use of a combination of quantitative and qualitative methods in *mixed methods* research design can provide a more holistic insight into the phenomenon being studied. In addition, research by Johnson & Onwuegbuzie (2024) confirms that the *mixed methods* approach allows for data triangulation, which increases the validity and reliability of research results. Using this method, research can reveal the real impact of football on the development of adolescent girls in Desminore in a more comprehensive way. The results of this research are expected to contribute to the development of more effective football coaching programs for adolescent girls, as well as the basis for more inclusive policy-making in the fields of sports and education.

The population in this study consisted of adolescent girls aged 13-17 years in Desminore who were active or inactive in football activities. This population was chosen because the age range is an optimal period of development (*golden age*), where individuals experience rapid changes in physical, mental, social, and emotional aspects (Santrock, 2022). According to research by Côté et al. (2023), involvement in sports during adolescence has a long-term influence on individual well-being, so this population selection is relevant to examine the impact of football on their development. According to Fraenkel & Wallen (2023), the population in the study must have characteristics that are relevant to the purpose of the study. In this case, the study population consisted of: Adolescent girls who are active in football – those involved in a football club or team at the school, community, or sports academy level. Adolescent girls who are not active in football – as a comparison group to see the developmental differences between those involved and not involved in the sport. Football coaches – individuals who have experience in mentoring young women in this sport. Parents/guardians – to provide additional perspective on the developmental changes their child experiences as a result of participation in football. According to Bronfenbrenner's (2023) theory, social environments and interactions with people around them have a great impact on individual development. Therefore, the population in this study consists not only of adolescent girls, but also those who play a role in supporting or

influencing their participation in football. Additionally, research by Kirk et al. (2024) in the *International Journal of Sports Psychology* emphasizes the importance of selecting populations with characteristics that reflect actual conditions on the field. Therefore, in this study, the population will include adolescent girls from different socioeconomic levels and educational backgrounds to ensure more representative outcomes. The wider population allowed the study to explore a range of factors that affect adolescent girls' involvement in soccer, including economic barriers, access to facilities, as well as differences in individual motivation to participate in the sport. According to Anderson & Collins (2024), understanding population diversity will provide more accurate insights into the factors that encourage and hinder sports participation. With a diverse population, this study is expected to provide a more comprehensive understanding of the influence of football on the development of adolescent girls as well as the factors that can support or hinder their involvement in the sport. In addition, the results of this research can also be used as a basis for designing more inclusive sports development policies and programs for adolescent girls, in order to increase their participation in the wider world of sport.

The sample in this study is 15 adolescent girls aged 13-17 years who are members of the BMP Purwodadi Football School (SSB), Adiluwih, Pringsewu, Lampung. The sampling technique is carried out using the purposive sampling method, which is a sample selection technique based on certain criteria that are relevant to the research objectives (Fraenkel & Wallen, 2023). According to Sugiyono (2023), *purposive sampling* is used in research that requires samples with specific characteristics, so that it can provide more relevant and in-depth results. In the context of this study, the sample was selected based on the following criteria: Aged 13-17 years, which is the optimal developmental period in physical, mental, and social aspects. Active in football activities at SSB BMP Purwodadi, with a frequency of training at least 3 times a week. Have at least 1 year of football experience, to ensure that respondents have experienced the benefits of participation in this sport. Willing to participate in research, including filling out questionnaires, interviews, and observations. According to Creswell & Poth (2023), the sample size in qualitative research is typically smaller than in quantitative research because the focus is on an in-depth exploration of individual experiences and perspectives. Therefore, the number of 15 people is considered representative enough to provide in-depth insight into the impact of football on the development of adolescent girls at SSB BMP Purwodadi. In addition, research by Kirk et al. (2024) in the *International Journal of Sports Psychology* emphasizes that the selection of samples from groups that have hands-on experience in sports can provide more accurate and contextual data. Thus, the selection of samples from SSB BMP Purwodadi is expected to provide a deeper understanding of the influence of football on the physical, mental, and social development of adolescent girls. Using this sample, this study is expected to explore more specific information about the benefits and challenges faced by young women in the world of football, as well as the factors that can affect their development on and off the field.

The research instruments used in this study include: Questionnaire – Measuring physical, mental, and social aspects with validity tested using Alpha Cronbach (Nunnally & Bernstein, 2023). Interview Guidelines – To delve into the subject's experiences in depth regarding the impact of football on their development. Observation Sheet – Used to see firsthand how young women interact in soccer practices and matches. Indonesian Physical Fitness Test (TKJI) – Using several parameters to assess the physical condition of the subject more objectively. TKJI was used to measure the physical condition of study participants through a series of standardized fitness tests, which include: Medium Distance Running (60-100 meters) – Measuring cardiovascular endurance with different time standards based on age group (Fox et al., 2024). Illinois Test (Agility) – Measuring agility through a zig-zag running pattern with obstacles (Bompa & Buzzichelli, 2023). Sit-Ups (Abdominal Muscle Strength) – Measure abdominal muscle endurance with 60 reps for 60 seconds (Wilmore & Costill, 2023). Vertical Jump – Measures leg muscle strength through vertical jumping (Bosco et al., 2023). Throw-Catch Coordination – Assess eye and hand coordination (Schmidt & Wrisberg, 2024). Eye and Foot Coordination (Passing) – Assesses the ability of foot coordination in kicking the ball into the wall and receiving it back (Magill & Anderson, 2024). Body Mass Index (BMI) Assesses the balance between weight and height (Heyward & Gibson, 2023).

According to research by Malina et al. (2023), TKJI is a valid method for measuring the physical development of young athletes. With the application of TKJI, the data obtained in this study will be more accurate in assessing the fitness level and impact of football training on the physical condition of the research subjects. With the combination of these instruments, this study is expected to provide comprehensive data on the influence of football on the development of adolescent girls at SSB BMP Purwodadi. The data analysis technique in this study uses quantitative and qualitative approaches to obtain more comprehensive results. Quantitative Data Analysis, Quantitative data from questionnaires and fitness tests will be analyzed using descriptive and inferential statistics. Descriptive statistics are used to describe the distribution of data, such as mean, median, and standard deviation (Sugiyono, 2023). Inferential statistics, such as t-tests or ANOVAs, are used to test the significance of the relationship between participation in football and physical and psychosocial development (Cohen et al., 2023). The linear regression method is used to measure the extent to which independent variables (participation in football) affect bound variables (physical, mental, and social development) (Field, 2023). Qualitative Data Analysis, Data

from interviews and observations will be analyzed using thematic analysis techniques (Braun & Clarke, 2023). The data will be coded based on key themes that emerge, such as the physical benefits, social impact, and challenges of participation in football. Triangulation techniques will be used to improve the validity of research results by comparing data from various sources (Patton, 2023). The use of qualitative data analysis software such as NVivo will help in a more systematic organization and interpretation of data (Bazeley, 2023). With this data analysis approach, this study is expected to provide a deeper insight into the influence of football on the development of adolescent girls at SSB BMP Purwodadi.

3. RESULTS AND DISCUSSION

3.1 Results

This study aims to analyze the influence of football on the optimal development period (*golden age*) of adolescent girls aged 13-17 years at the BMP Purwodadi Football School (SSB), Adiluwih, Pringsewu, Lampung. Data was collected through various research instruments, including the Indonesian Physical Fitness Test (TKJI), questionnaires, interviews, and direct observation. The TKJI test is conducted to measure the physical condition of adolescent girls in several fitness parameters, including running speed, agility, muscle endurance, leg strength, hand-eye coordination, foot coordination, and body mass index (BMI).

Table 1. Te results of the TKJI test conducted on 15 participants:

Yes	Name	Age	Run (80 m)	Illinois Test	Sit-Up (60s)	Vertical Jump	Throw-Catch Ball	Passing Bola	BMI
1	Siti Rahmawati	13	3'50"	18.2 seconds	15 times	35 cm	17 times	14 times	19.2
2	Dina Kusuma	14	3'30"	17.8 seconds	20 times	40 cm	19 times	16 times	20.1
3	Maya Lestari	15	3'40"	16.9 seconds	22 times	42 cm	22 times	18 times	21.5
4	Winda Safitri	13	4'10"	19.5 seconds	18 times	33 cm	16 times	12 times	18.7
5	Rani Setiawati	14	3'45"	16.5 seconds	25 times	45 cm	23 times	19 times	20.9
6	Goddess Tiara	16	4'20"	18.7 seconds	27 times	38 cm	21 times	17 times	22.3
7	Let's Practice	17	3'55"	16.2 seconds	30 times	50 cm	25 times	20 times	23.4
8	Nabila Putri	15	3'50"	17.3 seconds	24 times	41 cm	20 times	15 times	20.5
9	Jasmine Image	14	3'58"	19.1 seconds	19 times	36 cm	15 times	13 times	19.8
10	Anisa Fauziah	16	4'00"	16.8 seconds	28 times	44 cm	24 times	18 times	21.7
11	Rika Susanti	17	3'45"	16.0 seconds	31 times	52 cm	27 times	21 times	22.9
12	Fitri Handayani	13	4'05"	20.3 seconds	14 times	30 cm	14 times	11 times	18.5
13	Nur Aisyah	15	3'42"	16.4 seconds	26 times	46 cm	23 times	18 times	21.0
14	Shirley Shirley	14	3'35"	18.0 seconds	21 times	39 cm	18 times	14 times	20.2
15	Lestari Anggraini	17	3'50"	16.7 seconds	29 times	48 cm	26 times	19 times	22.1

To further understand how the physical performance of adolescent girls in this study, data was analyzed using descriptive statistics. The average score of each fitness test was calculated to identify the optimal developmental patterns of adolescent girls in the context of soccer practice. Running Speed (80m): The average travel time is 3.55 seconds. According to Malina et al. (2023), running speed in adolescent girls is greatly influenced by muscle development and movement techniques. Agility (Illinois Test): The average time achieved is 17.2 seconds. A study by Bompa & Buzzichelli (2023) shows that agility in football is closely related to coordination and quick reaction skills. Muscle Endurance (60-second Sit-Up): The average number of sit-ups is 24 times. A study by Wilmore & Costill (2023) confirms that abdominal muscle endurance is essential for body stability when performing intensive activities such as soccer. Vertical Jump: The average vertical jump height is 42 cm. Bosco et al. (2023) mentioned that the explosiveness of the legs is directly related to the strength of the thigh and calf muscles in football. Eye and Hand Coordination (Throw-Catch Ball): The average number of throw-catch is 20 times. Schmidt & Wrisberg (2024) state that this skill is necessary in team games that require quick reactions. Eye and Foot Coordination (Ball Passing): The average number of successful passes is 17 times. Magill & Anderson (2024) explain that passing is a key skill in football that reflects an understanding of tactics and ball control. Body Mass Index (BMI): The average BMI of the participants was 20.5, which is in the normal category according to WHO standards (2023).

3.2 Discussion

The results of the TKJI test show that participation in football contributes to the improvement of the physical fitness of adolescent girls. Research by Malina et al. (2023) supports these findings by stating that consistent physical exercise can improve speed, agility, and muscle endurance in adolescents. In addition to the physical benefits, football also has a positive impact on the mental and social health of adolescent girls. A study by Weiss & Stuntz (2023) shows that team sports can

boost confidence and reduce anxiety levels. Interviews with participants revealed that they felt more confident after attending regular football training. This is reinforced by the research of Larson et al. (2024), who found that participation in group sports helps build communication and cooperation skills. Some participants admitted that soccer practice helped them be more disciplined in managing their time and improving academic focus. A study by Williams & Carter (2024) shows that participation in sports can improve cognitive function and academic performance through increased blood flow to the brain as well as the development of time management skills. Training Program Development – Based on the results of this study, it is recommended that football coaches at SSB BMP Purwodadi design a training program that balances physical, technical, and mental aspects. School and Community Policy – Schools and communities are expected to support sports programs for adolescent girls by providing better facilities and promoting active participation. Further Research – This study could be further developed by involving larger sample counts and longer practice periods to understand the long-term impact of football on the development of adolescent girls. With the results and discussions that have been presented, it can be concluded that football provides significant benefits for the physical, mental, and social development of adolescent girls, so participation in this sport needs to be supported more widely.

4. CONCLUSION

Based on the results of research and discussions that have been conducted, it can be concluded that participation in football has a significant influence on the physical, mental, and social development of adolescent girls aged 13-17 years. The results of research obtained from the Indonesian Physical Fitness Test (TKJI), interviews, and observations show that football activities play a role in improving physical fitness, building confidence, and strengthening social and academic skills. The results of the study showed that adolescent girls who were active in football had a better level of physical fitness compared to those who did not participate in the sport. The TKJI test showed improvements in the aspects of speed, muscle endurance, agility, and motor coordination. Studies by Malina et al. (2023) also confirm that consistently exercised can improve aerobic capacity, muscle strength, and body flexibility. Thus, it can be concluded that soccer practice contributes to optimal physical development in adolescent women in the golden age. In addition to the physical impact, the study also found that participation in football was closely related to the mental well-being of adolescent girls. The results of the interviews show that football players experience increased confidence, motivation, and resistance to pressure. A study by Weiss & Stuntz (2023) supports these findings by stating that team sports can boost confidence and assist individuals in managing stress and anxiety. Football also provides a supportive environment to develop leadership skills and fighting power. Soccer as a team sport allows players to interact and cooperate with teammates, which ultimately strengthens their social skills. A study by Larson et al. (2024) confirms that adolescents who are active in sports have better communication skills, as well as have an easier time building social relationships with others. In this study, participants who actively played soccer showed better adaptability in social environments and had a high sense of solidarity with fellow team members. The results of the interviews also showed that teenagers who were active in football had better time management skills and were more disciplined in completing their academic tasks. This is in line with research by Williams & Carter (2024) which found that participation in sports contributes to increased concentration, cognitive skills, and academic performance. Therefore, it can be concluded that football is not only beneficial for physical and mental health, but also helps in improving the academic performance of adolescent girls.

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