



## The Development of Specific Training Programs to Improve the Speed, Agility, Quickness, and Pass-Receiving Performance of Soccer Players

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### Abstract

**Background and Aim:** In the field of college-level soccer, the quality of training mode is directly related to the overall competitive level of the team and the individual performance of the athletes. However, although soccer training at the college level is often aimed at specialization and systematism, research has shown that several common problems prevent the optimal results of training. These problems may involve a lack of personalized, targeted, or scientifically based training programs that limit overall improvement in speed, agility, quickness, and pass-receiving performance. Some college-level soccer training programs may fail to adequately account for individual athlete differences and fail to accurately locate and address bottlenecks in specific skills and abilities. This can lead to erratic training results, making it difficult for some athletes to perform at their best in competition. Therefore, it is necessary to conduct an in-depth analysis of the problems existing in the current college-level soccer training and propose a specific training program to promote the athletes in the key skills and abilities more targeted. To address these issues, this study aims to develop a specific soccer training program to improve the speed, agility, quickness, and pass-receiving performance of college-level soccer players. A specific training program is a training method that combines different training methods and principles, which can make full use of the advantages of various training methods and avoid the disadvantages of various training methods, to achieve the best training effect. The main purposes of this study are as follows: 1) To explore the training elements and mechanisms related to speed, agility, quickness, and pass-receiving performance and to provide a theoretical basis and guiding principles for specific training programs. 2) Design and implement a specific training program to provide college-level soccer players with a novel and effective way of training to improve their skill level and competitiveness. 3) To evaluate and compare the effect and improvement of the specific training program, to provide empirical evidence and suggestions for the optimization and innovation of soccer training.

**Materials and Methods:** This study's main objective is to develop of specific training program to improve speed, agility, quickness, and pass-receiving performance for soccer players. In this experiment, 32 school soccer players from Jiying University were selected as experimental subjects by simple random sampling. The experimental group (N=16) underwent specific training intervention, while the control group (N=16) underwent regular training. The test indicators were selected from the "2021 National Youth Campus Soccer Summer Camp Best Team Selection Test Measures" jointly issued by the Ministry of Education and the Department of Physical Health and Art in April 2021. There are 5 test indicators in total: the 10-meter sprint test (sec), Agility test (sec), Pass-receiving Performance (sec), quickness test (sec), and Pass performance (sec), which mainly examined the comprehensive test plan of various special physical qualities such as athletes' speed, agility of dribbling change direction, quickness, pass-receiving performance. The experimental group then followed a specific training program for 8 weeks, 3 days, and 1.30 hours per day.

**Result:** The results showed that there was no significant difference between the two groups of athletes before the experiment ( $p > 0.05$ ), which provided a basis for the experiment. After 8 weeks of experimental, the experimental group 5 test indicators had significant differences compared with the control group and also within the experimental group ( $p < 0.05$ ).

**Conclusion:** This specific training program can improve the pass-receiving performance of soccer players.

**Keywords:** Specific Training Program; Pass-receiving Performance; Soccer Players

### Introduction

Soccer, as a sport, demands a multifaceted skill set from players, with attributes such as speed, agility, quickness, and proficient pass-receiving skills playing pivotal roles in determining success on the field. soccer is a global sport, which requires not only a high level of technical and tactical ability but also excellent physical and psychological quality. soccer players need to frequently perform in the aspects of speed, agility, quick reaction ability, and pass-catching performance in the game, which have



an important impact on determining the outcome of the game and the competitive level of athletes (Chen, 2020). However, in Chinese campus soccer, soccer coaches are faced with some challenges, such as insufficient teaching resources, single teaching methods, and difficult evaluation of teaching effects (Gao, F. 2014). These problems limit the professional development of soccer coaches and also affect the learning effectiveness and interest of soccer players. Therefore, soccer coaches need to find new teaching models and teaching methods to adapt to the diverse needs and learning styles of soccer players. Therefore, how to improve the ability of soccer players in these aspects through scientific and effective training methods is a problem that soccer coaches and athletes pay attention to. The study of soccer training, there are many studies on the influence of different types of training methods on soccer players, such as strength training, speed training, agility training, technical training, etc. (Chen, 2018). Each of these training methods has its advantages and limitations, but a single training method often difficult to meet the various needs of soccer players, and it is difficult to adapt to the complexity and variability of soccer (Que, 2020). Therefore, it is necessary to explore a training method that can synthesize different types of training methods to achieve the purpose of improving the quality and ability of soccer players. Specific training methods refer to the organic combination of different types of training methods to achieve the best training effect (Jiang, 2020). Specific training methods can be flexibly adjusted and combined according to the individual differences of athletes, the characteristics of sports, the needs of training objectives, and other factors to achieve the best physiological adaptation, psychological adaptation, and technical adaptation effects (Ma, 2019). The purpose of this study is to explore a specific training program for soccer players to improve their speed, agility, quick reflexes, and passing performance. The research question of this study is: What effect does a specific training program have on the speed, agility, quickness, and pass-receiving performance of soccer players? This study hypothesizes that: Specific training programs can significantly improve the speed, agility, quickness, and pass-receiving performance of soccer players. The significance of this study is: to provide a scientific and effective training method for soccer coaches and athletes, to improve the competitive level and efficiency of soccer players; It provides a practical case and theoretical basis for the application of specific training methods in soccer. To provide a means and impetus for the development and popularization of soccer.

Specific training, which combines multiple training modalities, has a positive effect on athletes' performance. However, the effect of this training on soccer-specific sports performance has been less studied in China. Therefore, the level of specific training in college soccer is of great significance to the development of campus soccer.

## Objectives

To study the results and compare the results of developing a specific training program to improve the speed, agility, quickness, and pass-receiving performance of soccer players.

## Literature Review

The purpose of this study is to develop specific training to improve speed, agility, quickness, and pass-receive performance in soccer players. The main focus is to conduct a literature review of the concepts and theories related to specific training programs, speed, agility, quickness, and pass-receive performance, and to analyze the current status of domestic and international research and problems, with the following chapters.

### 1. Specific Training Program

Specific Training Program refers to the combination of different types of training methods to improve the multi-faceted ability and adaptability of athletes. The advantage of a Specific Training Program is that it can flexibly adjust the content, intensity, frequency, and duration of training according to the individual differences, training goals, and sports characteristics of athletes, to achieve the best training effect (Loturco et al., 2017)

### 2. Speed

Speed is the reciprocal of the time it takes a player to complete a movement over a certain distance, usually expressed in meters per second or kilometers per hour. Speed is one of the most basic and important physical qualities in soccer, which directly affects the competitiveness of soccer players in the game. Speed can be categorized into the following types:

Starting Speed: refers to the time taken by the athlete to accelerate from a stationary state or low speed to the maximum speed. Starting Speed reflects the explosive power and reaction ability of the



athlete and is the most common and important type of speed in soccer. Starting speed is mainly influenced by neurological, muscular, and biomechanical factors (Buchheit, et al., 2014).

**Maximum Speed:** refers to the highest speed reached by an athlete over a certain distance. Maximum speed reflects the extreme level of the athlete and is a less used but important type of speed in soccer. Maximum speed is mainly influenced by the nervous system, muscular system, biomechanical factors, and cardiorespiratory factors (Buchheit, et al., 2014).

**Endurance Speed:** It refers to the ability of an athlete to maintain a high speed over a longer distance or for a longer period. Endurance speed reflects the durability and stability of the athlete and is one of the more difficult and important types of speed to develop in soccer. Endurance speed is mainly influenced by cardiorespiratory function, muscular system, biomechanical factors, and psychological factors (Buchheit, et al., 2014).

### **3. Agility**

Agility refers to the athlete's ability to change direction or speed quickly during the movement according to external stimuli or their intention. Agility is one of the very important physical qualities in soccer, which directly affects the adaptability and creativity of soccer players in the game. Agility can be categorized into the following two types:

**Reactive Agility:** refers to the athlete's ability to react and adjust quickly to external stimuli, such as opponents, teammates, or the ball, during movement. Reactive agility reflects an athlete's ability to perceive, make decisions, and execute, and is one of the most commonly used and critical types of agility in soccer. Reactive agility is primarily influenced by cognitive, neurological, muscular, and biomechanical factors (Sheppard & Young, 2006).

**Planned agility:** refers to an athlete's ability to change direction or speed quickly during movement based on his or her intentions, such as tactical arrangements or technical maneuvers. Planned agility reflects an athlete's ability to plan, execute, and coordinate, and is a lesser-used but important type of agility in soccer. Preset agility is primarily influenced by neurological, muscular system, and biomechanical factors (Sheppard & Young, 2006).

### **4. Quick Reaction Ability**

**Quick Reaction Ability** refers to the athlete's ability to react correctly as soon as possible after receiving external stimuli. Quick Reaction Ability is one of the very important physical qualities in soccer, which directly affects the soccer player's opportunity grasping and risk avoidance in the game. Quick reaction ability can be divided into the following two types:

**Visual Reaction Ability:** refers to the athlete's ability to react quickly according to visual stimuli, such as the ball, opponents, teammates, or referees. Visual Reaction Ability reflects the athlete's visual perception ability, visual attention ability, and visual memory ability, and is one of the most commonly used and important types of rapid reaction ability in soccer. Visual reactivity is mainly influenced by the cognitive, neurological, and oculomotor systems (Williams & Davids, 1998).

**Auditory Reaction Ability (ARA):** refers to an athlete's ability to respond quickly based on auditory stimuli, such as sounds, words, or instructions. Auditory Reaction Ability reflects an athlete's auditory perception, auditory attention, and auditory memory abilities, and is a less used but important type of rapid reaction ability in soccer. Auditory reactivity is primarily influenced by the cognitive system, the nervous system, and the eardrum system (Williams & Davids, 1998).

### **5. Pass-receiving performance**

**Pass-receiving performance** refers to the technical level and effect of soccer players in passing and receiving the ball in the game. Pass-receiving performance is one of the very important technical qualities in soccer, which directly affects the soccer players' ability to control the ball and cooperate in the game. Passing and receiving performance can be divided into the following types:

**Short Pass-Receiving Performance:** refers to the technical level and effect of the soccer player in the distance closer to the pass and receive the ball. Short Pass-Receiving Performance reflects the touch skills, passing accuracy, and receiving stability of soccer players, and is the most common and basic type of passing and receiving performance in soccer. Short pass and catch performance is mainly influenced by technical, tactical, and psychological factors (Carling, et al., 2005).

**Long Pass-Receiving Performance:** refers to the skill level and effectiveness of soccer players in passing and receiving the ball over long distances. Long Pass-Receiving Performance reflects a soccer player's power control, passing angle, and receiving coordination, and is a less used but important type of passing and receiving performance in soccer. Long pass and catch performance is mainly influenced by technical, tactical, and environmental factors (Carling, et al., 2005).



Crossing Pass-Receiving Performance: refers to the skill level and effectiveness of soccer players in passing and receiving the ball on the sidelines or in the corner. Crossing Pass-Receiving Performance reflects a soccer player's speed adjustment, passing arc, and catching timing, and is a difficult and important type of pass-receiving performance in soccer. Cross-catch performance is mainly influenced by technical, tactical, and opponent factors (Carling, et al., 2005).

In summary, domestic and international research on specific training programs for improving speed, agility, quick reaction ability, and passing and catching performance has achieved certain results and progress, but there are also some problems and shortcomings, mainly in the following aspects: The research object and scope are more limited, lacking in-depth and extensive research on soccer players of different ages, genders, levels, and regions, making it difficult to form universally applicable conclusions and laws. The research methods and tools are relatively single, lacking comprehensive and systematic research on specific training programs of different types, difficulties, and situations, making it difficult to form a perfect and scientific training system and evaluation system. The research content and indicators are relatively one-sided, lacking comprehensive and in-depth research on different aspects, levels, and dimensions of speed, agility, quick reaction ability, and passing and receiving performance, making it difficult to form accurate and effective evaluations and feedback. Therefore, this study aims to explore a new type of specific training program based on the current status and problems of domestic and international research to improve the speed, agility, quick reaction ability, and passing and receiving performance of soccer players, and to scientifically design, implement, evaluate and feedback the training program, to provide theoretical basis and practical guidance for the training of soccer players.

## Conceptual Framework

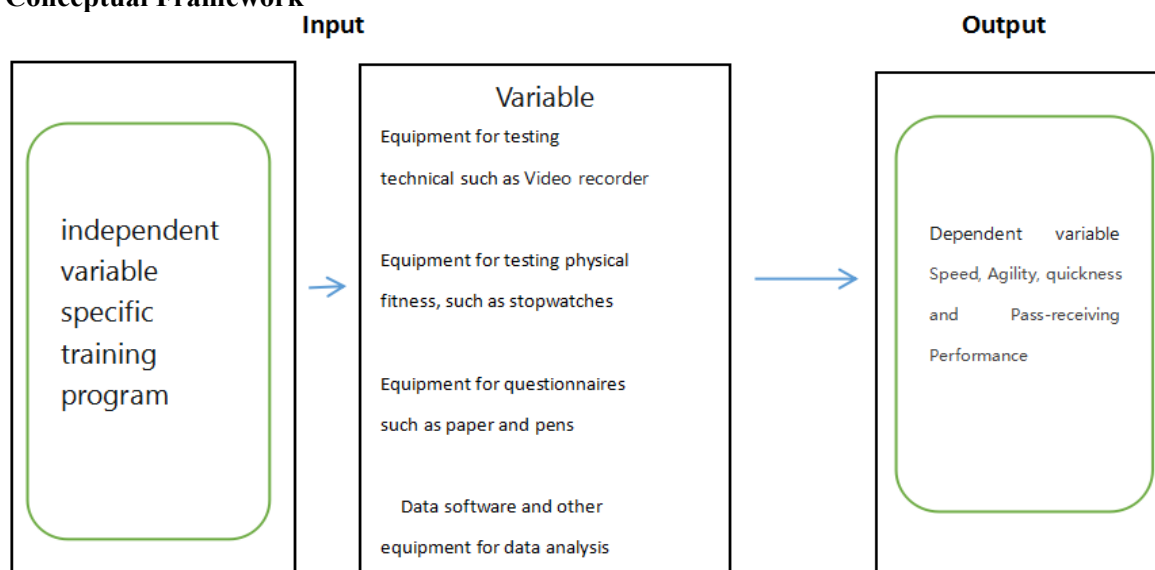


Figure 1 Conceptual Framework

## Methodology

### 1. Population and sample

Thirty-two soccer team members of Jiaying University were selected as the study subjects, and the average age of the study subjects was  $17.5 \pm 0.89$  years old. The experimental group received specific training, and the control group received regular special physical fitness training. For the test methods, content, and test standards of the experimental group and control group, the "Test Methods for the Best Team Selection of the National Youth Campus Soccer Summer Camp in 2021" jointly issued by the Ministry of Education of the People's Republic of China and the Department of Physical Health and Art were selected for testing because it is a test method to test the comprehensive physical quality of soccer talents. The experimental group and the control group were tested to see whether there was any significant difference in pre-test scores, and then the experimental intervention lasted for 8 weeks. After



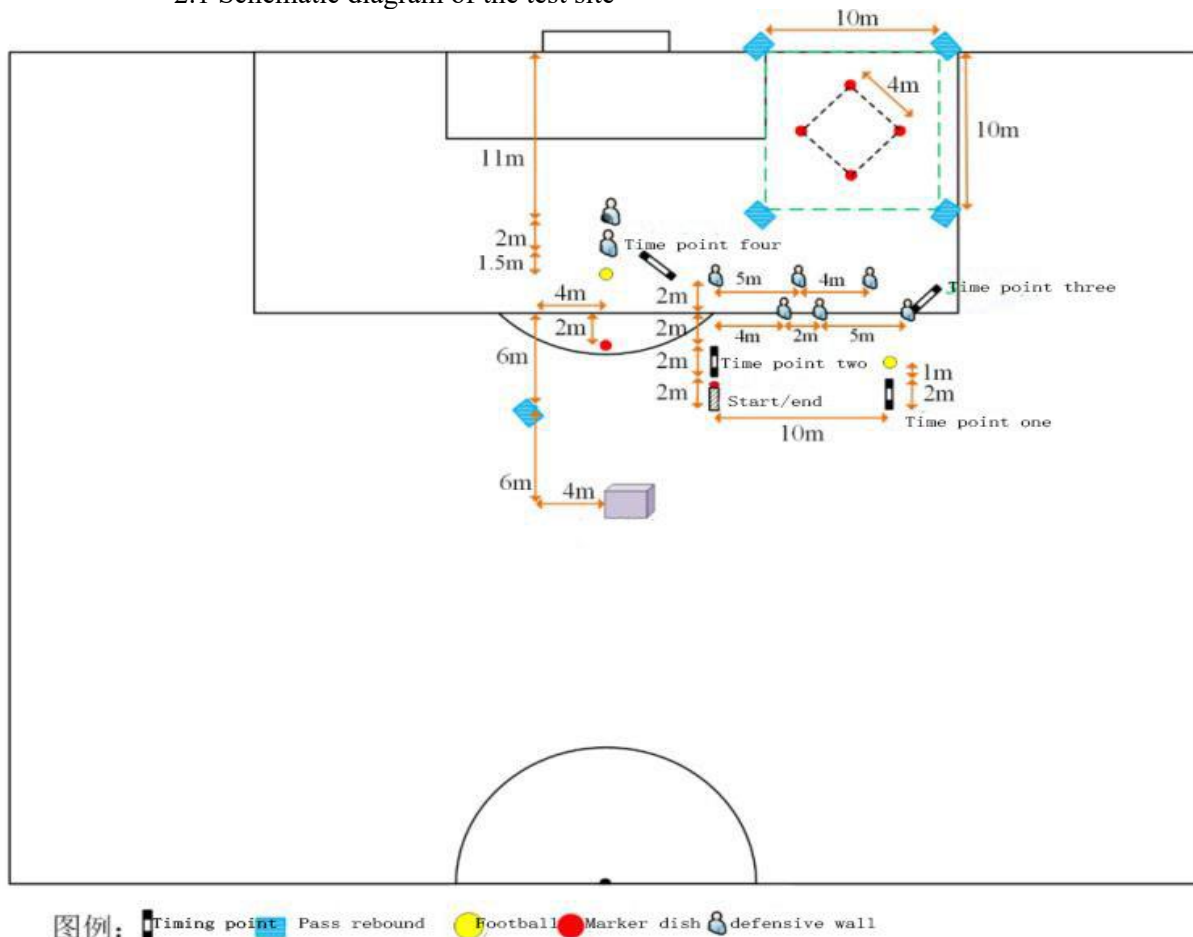
the end of the experiment, the data were obtained, and the results of each variable before and after the experiment were compared between the two groups. Grouping of subjects: 32 athletes were by simple random sampling. Then, after grouping, according to the basic information of the athletes, the average age, height, weight, and BMI of the two groups of athletes were calculated and the standard deviation was calculated to test whether there were significant differences in the Basic physical fitness of the tested soccer players. Subsequently, the "Technical Testing Methods for the Best Team Selection of the National Youth Campus Soccer Summer Camp in 2021" jointly issued by the Ministry of Education and the Department of Physical Health and Art were selected as pre-test and post-test to test whether there were significant differences in the speed, agility, quickness and pass-receive performance of soccer players before and after the experiment. There were 16 subjects in both the experimental group and the control group. Independent sample t-tests and paired sample t-tests in data statistical software were used to test and analyze the differences between the experimental group and the control group.

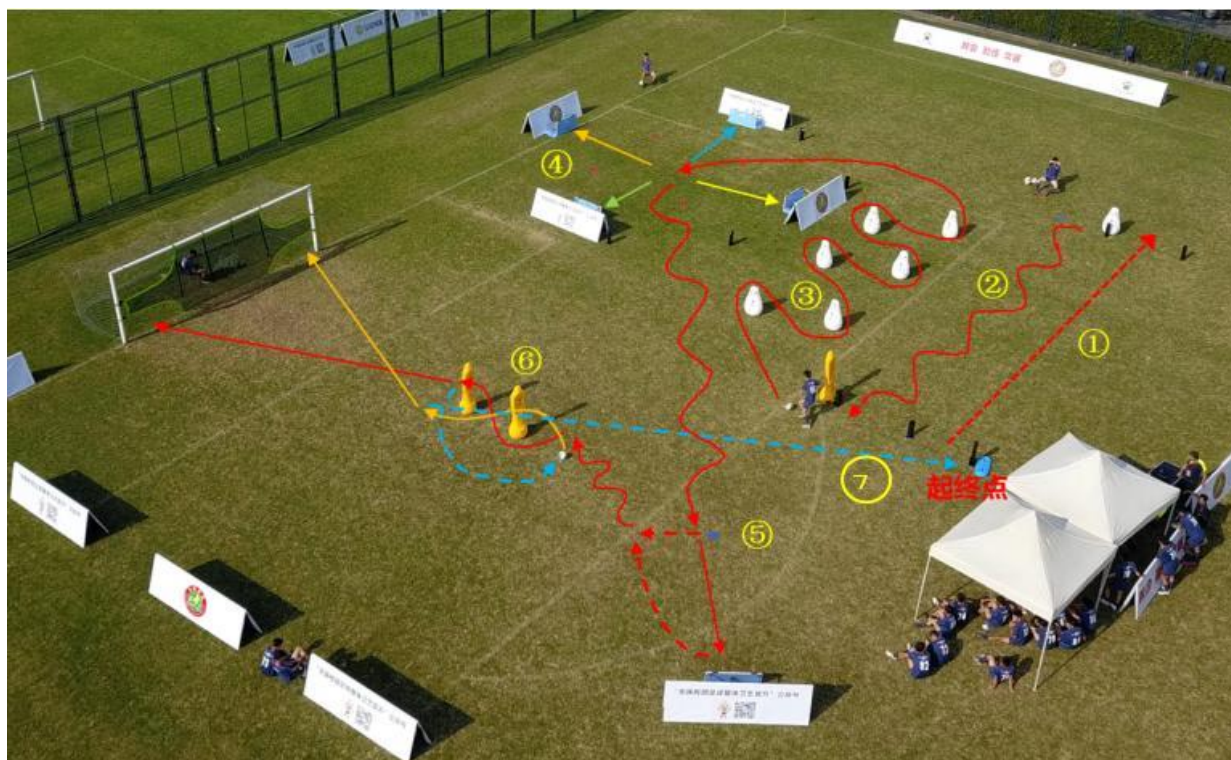
## 2. Research tools

1. WPS table and Analytical Software

2. Test content variables and test process

2.1 Schematic diagram of the test site





2.2 Analysis of the indicators of speed, agility, quickness, and pass-receiving performance test content:

(1) 10-meter sprint test (sec): it can mainly represent the displacement speed and reaction speed of the athlete. (2) Agility test (sec): mainly represents the agility of athletes, special sensitive quality, body conversion ability, etc.. (3) Pass-receiving Performance (sec): mainly represents the pass-receiving performance of athletes. (4) Quickness test (sec): mainly represents the random sensitivity, quickness, and so on. (5) Pass performance (sec): mainly represents the athlete's special strength, pass performance, special sensitivity, etc..

### 3. Data collection

#### 1. Expert interview method

During the research process, I visited and communicated with experts in the field of soccer at the Guangzhou Institute of Sport and physical fitness coaches in grassroots schools, consulted on the framework structure, research methods, experimental design, variables selection, and other aspects of the paper, and widely listened to opinions and summarized.

#### 2. logical analysis

In the research process, the investigation information, research data, and research results are compared, deduced, and summarized.

#### 3. Data analysis and statistics

Conventional statistical software such as Excel was used to collect, sort, and screen the feedback data of the experimental group and the control group. Data statistical software was used to analyze the collected data. This experiment mainly used paired sample T-test to analyze the changes of test indicators in the experimental group and the control group before and after the experiment and analyzed the intervention effects of different groups. Independent sample T-test was used to analyze the two groups of data between the groups, and the research results were obtained according to the analysis, and the results were analyzed.

### 4. Data Analysis

The validity of the data was tested by the t-test. The test data of each group before and after the experiment were saved through Excel. Data statistical software was used to establish a database and



process the measured data before and after the experiment. The difference between the two groups before and after the experiment was detected by an independent sample t-test, and the influence of specific training on the speed, agility, quickness, and pass-receiving performance of college students in soccer was determined after comparative analysis.

## Results

After the experimental intervention, the test results of various indicators of speed, agility, quickness, and pass-receiving performance were analyzed for the athletes in the experimental group and the control group. The independent sample t-test was used to analyze the test data and there were significant differences.

Table 1 Mean comparison of post-tests between the control and an experimental group by t-test, independent (n = 16).

Variable	Group	Mean	df	t	p
10-meter sprint test (sec)	Experimental group	2.68	30	2.08	0.04*
	Control group	2.83			
Agility test (sec)	Experimental group	12.35	30	2.48	0.01*
	Control group	13.16			
Quickness test (sec)	Experimental group	5.00	30	2.13	0.04*
	Control group	5.41			
Pass performance (sec)	Experimental group	7.84	30	2.41	0.02*
	Control group	8.48			
Pass-receiving Performance (sec)	Experimental group	12.45	30	3.33	0.01*
	Control group	13.32			

\*p<0.05

The table shows that the 10-meter sprint test, agility test, pass-receiving performance, quickness test and pass performance test of post-test between the control with the experimental group were significant differences (\*P<.05).

Table 2 Compare the mean between test the pretest and posttest within the experimental group by t-test independent(n=16)

Variable	Time	Mean	df	t	p
10-meter sprint test (sec)	Pre-test	3.14	15	3.10	0.01*
	Post-test	2.68			
Agility test (sec)	Pre-test	13.40	15	4.74	0.01*
	Post-test	12.35			
Quickness test (sec)	Pre-test	5.46	15	2.16	0.04*
	Post-test	5.00			



Variable	Time	Mean	df	t	p
Pass performance (sec)	Pre-test	8.73	15	4.68	0.01*
	Post-test	7.84			
Pass-receiving Performance (sec)	Pre-test	13.50	15	4.62	0.01*
	Post-test	12.45			

\*p<0.05

The table shows that the 10-meter sprint test, agility test, pass-receiving performance test, quickness test, and pass performance test within the experimental group showed significant differences between the pre-test and post-test.

## Discussion

The results of this study show that the specific training program has a significant improvement effect on pass-receiving performance. That's the results of training with specific training programs, which increase speed, agility, and quickness.

First, the results of this study showed that the specific training program had a significant effect on improving the speed of soccer players. This result is consistent with the findings of other studies, such as Arslan, et al (2020) found that high-intensity interval training for soccer players can effectively improve their speed and endurance.

Second, the results of this study showed that the specific training program had a significant effect on improving the agility of soccer players. This result is also consistent with the findings of other studies, such as Trecroci, A., et al. (2016) found that multidirectional and explosive training for soccer players can effectively improve their agility and change of direction ability.

Third, the results of this study showed that the specific training program had a significant effect on improving the quickness and reaction ability of soccer players. This result is also consistent with the findings of other studies, such as Zhang (2019) found that reaction ability training for soccer players can effectively improve their reaction time and decision-making ability.

It had a positive effect on the ability to pass and receive the ball because it allowed the athlete to move into the cover area and have enough time to complete the skill of passing and receiving the ball. Recent studies found that Speed, agility, and quickness training programs have been shown to have a positive effect on soccer performance. In one study, soccer-specific exercise improved passing task time and passing accuracy, indicating an improvement in pass-receiving performance (Azmi & Kusnanik, 2018). Another study found that a speed, agility, and quickness (SAQ) training program significantly improved sports performance measures, including vertical jump, sprint, and agility tests (Walankar & Shetty, 2020). Additionally, a short-term SAQ training program was found to induce improvements in cognitive and physical performance in pre-adolescent soccer players (Athos, et al. 2022). Furthermore, a study focusing on speed, agility, and quickness training found that it significantly improved speed, agility, and acceleration in soccer players (Elhofy, 2013). Finally, a study on agility drills in junior soccer players found that a training program had a positive impact on speed and agility abilities, which are crucial for pass-receiving performance (Konark, et al, 2023).

In summary, the specific training program in this study has shown significant improvements in the speed, agility, quickness, and pass-receiving performance of soccer players. However, for a comprehensive understanding of the program's effectiveness, further in-depth comparisons and analyses with other studies are necessary. This will help reveal the strengths and limitations of the training program, providing more targeted recommendations for future training.

## Recommendation

### Practical Significance

1) When making specific training plans, coaches should consider external factors such as the differences and particularities of athletes themselves and should not blindly copy. It is suggested that in





the teaching process, we should start from the reality of athletes, follow the law of their physical and mental development, and consider their basic skills, athletic ability, and competition ability.

2) The specific training is quite effective in special speed, random agility, and quickness. But it cannot completely replace the regular special physical fitness training. We should effectively integrate the advantages of specific training with the advantages of regular special physical fitness training. It is suggested that researchers and coaches should combine the training content of the specific training to improve the special speed (multi-directional movement), random agility (step frequency, step point), and quickness with the training content of the regular training to improve the strength and endurance. To provide more comprehensive and targeted help for the development of young soccer players, so that young soccer players can achieve better sports results.

### Future Research

Based on further research, we can also explore some potential related issues and future research directions. First, while our study focused on the effects of a specific training program, are there other factors that also have an impact on a soccer player's speed, agility, quickness, and ability to pass-receiving performance? Future studies could consider exploring other possible factors, such as nutrient intake, sleep quality, individual characteristics, etc., to gain a more complete picture. Second, our study focused on the effects of short-term training interventions, but how does a long-term training program affect the ability and skill level of soccer players? Is there a lasting effect of training? Further research could track and evaluate the effects of long-term training programs and compare them with short-term programs. Also, since soccer is a team sport, does the interaction between the team and the individual have an impact on the effectiveness of the training program? Future research could consider exploring the effects of teamwork training on speed, agility, quickness, and pass-receiving performance ability, as well as gaining insight into how the team environment supports and adapts to training programs. Finally, our research focused on speed, agility, quickness, and pass-receiving performance, but are there other key abilities and skills that need to be considered as well? For example, does the training of strength, endurance, accuracy, etc., play an important role in the overall ability of soccer players? Future research could further explore and integrate various training methods and techniques to improve overall ability. Overall, our research provides a viable hybrid approach training program for improving the speed, agility, quickness, and pass-receiving performance ability of soccer players. Future research could further explore other relevant factors, the effects of long-term training programs, the influence of team environments, and the training of other key abilities and skills. These research efforts will contribute to the overall development of soccer players and improve their level of performance in the game.

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