International Journal of Sociologies and Anthropologies Science Reviews (IJSASR), 3 (3): May-June 2023, page 239-250. ISSN: 2774-0366
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index
DOI: https://doi.org/10.14456/jsasr.2023.51

Construction of Comprehensive Tests to Evaluate College Men Football Players' Performance

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Received 03/06/2023 Revised 08/06/2023 Accepted 11/06/2023

Abstract

Background and Aim: With the development of football, higher requirements have been put forward for the abilities of football players. Football teachers and coaches need to scientifically and accurately evaluate the performance of football players, grasp the advantages and disadvantages of their sports performance, and provide assistance and guidance for football teaching and training. The purpose of this study is to establish a comprehensive evaluation model based on technical, physical fitness, psychological, and anthropological aspects, to predict and evaluate the football performance of male college students.

Materials and Methods: In this study, 156 football players were from Shaoguan University in Guangdong Province, China. Through the Delphi method, the test indexes of football performance were determined, and all 156 subjects were strictly tested. The methods for data collection and analysis include median, IQR, Pearson correlation analysis, Spearman correlation analysis, and Stepwise regression analysis. The data analysis software is mainly SPSS 20.0.

Results: Through analysis, it was found that long pass, fast dribble shot, vertical jump, competitive motivation, and 10meter run were the key factors affecting football players' performance, and the regression prediction model obtained was: 0.935+0.046× (Long pass) −0.140× (Fast dribble shot) +0.011× (Vertical jump) +0.011× (Competitive motivation) −0.731× (10-meter run).

Conclusion: The results of this study confirm that the evaluation of FPP needs to be conducted systematically, comprehensively, and multifactorial, and note that FPP cannot be evaluated from a single perspective. The results of this study provide an effective reference for the comprehensive evaluation of FPP, and all the research methods can be extended to other research fields.

Keywords: Football Performance; Comprehensive Football Tests; University Football Test Criteria

Introduction

In the field of sports, there is a lot of evaluation work in terms of teaching, training, competitions, and scientific research, especially for the evaluation of teaching, training, and competitions is the main content of every teacher and coach (Kaplan, et al, 2009). Scientific and accurate evaluation can guide players or teams to improve weak places, improve sports performance and achieve excellent competition results (Safri & Wood, 1995). It can also help athletes to evaluate their potential when they have not achieved their talents in the early days, help them choose suitable exercises for training, and grow into excellent athletes (Dragan, et al, 2010). However, most of the current evaluation of athletes in the sports field is based on the subjective understanding of teachers or coaches. Teachers and coaches judge what problems exist in the teaching, training, and competitions based on years of experience, and analyzing whether the athlete has great development potential.

Football game needs high-performance players, especially in sports for excellence and professional sport. Many countries believe that the performance of football players mainly includes technical, tactical, physical fitness, psychological, intellectual, and other factors (FIFA, 2016; Tian, 2017). Because factors such as tactics and intelligence are too abstract, they could lead the team to achieve winning in competition, but there is no authoritative and scientific method to test them, so most scholars conduct single-factor research on football technology and physical fitness (Waldron, 2010).

Most of the research subjects (Huijgen, 2009; Ali, 2010; Deprez, et al, 2015) are professional athletes, and the equipment used in the research is relatively professional and expensive, and most basic teachers and coaches cannot buy and use this equipment. So many coaches, teachers, and researchers used some tests to measure and evaluate the performance of football players such as physical fitness tests, football skill tests, or some psychological tests which did not cover all factors of football players' performance.

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In China, there are nearly 300 million football fans. But for decades, the development of Chinese football has not reached the goals expected by the country and the people, not only did the Chinese team fail to reach the World Cup finals for the second and third time as people expected, but the level of football has continued to decline, and the world rankings are also falling (Ma, 2010).

To change the status quo of Chinese men's football and improve the level of Chinese football, the Chinese government attaches great importance to the development of football, and a series of policies and documents have been issued in an attempt to improve the level of Chinese football (Huang, 2023). But looking at the world, the gap between the level of Chinese football and the football powers in Europe and Asia is still very obvious.

Many Chinese scholars believe that improving the performance of players on the football field is the core issue facing the development of Chinese football (Shao, 2022). However, most of the current evaluation of athletes in the sports field is based on the subjective understanding of teachers or coaches. Teachers and coaches judge what problems exist in the teaching, training, and competitions based on years of experience, and analyze whether the athlete has great development potential (Lv & Shi, 2019).

This research is to develop a comprehensive test consisting of collecting and selecting the factors which the most appropriate, finding out the test of each selected factor, developing and validating the test, and evaluating the efficiency and effectiveness of the constructed test. This research result could apply to the test to measure and evaluate the initial performance of football players at all levels and hope it will motivate some scholars to do further development to complete a set of tests.

Research Objectives

The objective of this research was to find the factors that affect football players' performance and construct a comprehensive model for evaluating and predicting football players' performance.

Review Literature

1. Concept of Football Player's Performance (FPP)

Some scholars believe that sports performance is the subjective condition or own ability of athletes to participate in competitions, and it is a subjective factor among many factors affecting athletes' competition results. It consists of five elements: physical fitness, skills, tactical ability, psychological ability, and knowledgeability (Tian, 2017).

FIFA believes that the performance of football players consists of five aspects: technical, tactical, and cognitive skills, psychological and social factors, physical fitness, and physical fitness (FIFA, 2016). The United Kingdom, the birthplace of modern football, according to the needs of football games has constructed a four-cornered model for the development of FPP from four aspects: technical, physical fitness, psychological and social interaction. The United States has put forward four complementary elements for football players to develop their competitive ability, namely technical, tactical, physical fitness, and psychological (Jiang, 2018).

2. Technical Aspects

Football belongs to the same-field confrontational skill-led project, and the technical ability of the players in the game is particularly important. FIFA believes that football technology is how to better combine the body and the ball, and divides football technology into two categories: offensive technology and defensive technology. Offensive skills include ball-handling, passing, shooting, etc. Defensive skills include stealing, intercepting, and defensive moves (FIFA, 2016).

Because of the importance of football technology, scholars from various countries have carried out a lot of research on football technology. Hughes & Bartlett (2002) believe that football matches belong to the same-field confrontation category, and the technical indicators of the game that have an important impact on the outcome of the game include scoring, shooting, interception, passing, ball possession time, on-field position, and set-pieces in a total of 8 categories index. Other scholars have conducted research with Chinese middle school students as samples, and believe that ball feel, dribbling, and kicking are important indicators for evaluating middle school football performance (Wang, 2016).

3. Physical Fitness Aspects

To deeply study the aerobic running ability of football players, the famous Danish scholar Bangsbo designed the Yo-Yo endurance test method with reentry running as the main activity mode. The Yo-Yo IR test evaluates an individual's ability to repeatedly complete high-intensity exercise and recovery, emphasizing the athlete's ability to recover between increasing-intensity anaerobic states (Bangsbo, et al, 2008).

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The research of Rampinini (2007) shows that repetitive sprinting ability is a necessary ability of a good football player. Some studies show that the higher the level of the game, the stronger the ability of the athletes to repeat the sprint, which reflects the high-intensity, intermittent exercise ability of high-level football players (Impellizzeri, 2008).

Negra (2017) conducted the Illinois turn test on 194 elite football players and found that the Illinois test has high detection reliability and can effectively evaluate the turning ability of football players. Dugdale (2018) conducted a 505 directional test on players aged 11 to 17 and found that the 505-test method also had high test reliability, especially for 16-year-old players.

And the same time, scientific training has a significant impact on the balance ability of football players, especially the ability to stand on one side (Teixeira, et al, 2011). Conversely, balance training can also promote the development of other abilities of football players (Bird & Stuart, 2012).

Scholars have also conducted a lot of research on the strength quality of football players. In football matches, athletes need strong strength to support any movement such as acceleration, long jump, turning, changing direction, and shooting. Therefore, strong strength is a necessary ability for every player and an important indicator to distinguish their athletic performance.

Flexibility is a major component of health-related fitness and one of the fundamental components of performance in certain sports. In football, a certain range of motion deficits may limit specific technical skills and reduce player performance (Young, 2007). The lower range of motion values in football players may also increase the risk of some muscle injuries (Henderson, et al, 2010).

4. Psychological Aspects

In football, players not only bear a huge physical load but also bear a huge psychological loaded. Therefore, how to improve the psychological quality of football players and improve their psychological skills to improve sports performance is an important content that football must pay attention to and solve. If there is no good level of psychological training, even if you do well in terms of technology, physical fitness, tactics, etc., it is difficult to achieve excellent results in the competition.

The reason top athletes can distinguish themselves from higher or middle-level athletes is their ability to solve their psychological problems. A good mental quality is a must to become a top player. Top football players should have a high degree of concentration, strong self-confidence, the right motivation, and psychological qualities such as risk-taking, team spirit, and striving to improve (FIFA, 2016).

Zhang (2013) conducted a psychological test on 53 football-specialized college students and found that emotion regulation can affect the decision-making accuracy of football players. Football players with high self-control ability have higher decision-making accuracy than those with low self-control ability.

5. Anthropometric

Guo (2020) conducted a comparative analysis of the age and body shape of the athletes in the 5 major regions of the 2018 Football World Cup and found that European players are superior to players from other continents in terms of height, weight, and Quetelet index. Some scholars have conducted comparative analysis on elite and sub-elite soccer players and found that a significant difference was found in weight, body mass index, bone content, and body fat, while a significant difference was not found in the two remaining variables, height, and muscle mass (Butler, et al, 2008).

6. Summary of Literature Review

In general, many scholars have carried out a lot of research on the sports performance of football players, and they have achieved rich results in terms of technical, physical fitness, anthropometric measurement, and psychological quality, which also provides a theoretical reference to writing this paper's fundamental implications.

However, judging from the existing results, there were still the following problems in the performance of football players:

(1) Most of the research results were obtained in laboratory tests. Although the test data was relatively accurate, the test equipment was expensive and complicated to operate. Ordinary football coaches and football teachers cannot afford to buy and use this equipment.

(2) Most of the results were research on professional football players, semi-professional football players, and elite football players in professional football clubs or countries, while less attention was paid to college football players.

(3) Most of the existing results were based on a single factor to analyze the sports performance of football players, especially the results of physical fitness analysis were the most common. But football is a responsible sport, and a comprehensive approach is needed to assess the performance of

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football players from multiple factors to obtain more accurate results. At present, research results assessed using this comprehensive test method are extremely rare.

Therefore, in response to the above 3 points, I choose college football players who were less concerned by scholars as the research object and try to construct a simple, convenient, easy, accurate, and reliable comprehensive test method to evaluate the sports performance of football players, hoping to provide help for the majority of college football players, ordinary coaches, teachers, and football fans to scientifically select football talents and improve football performance.

Conceptual Framework

The research title "Construction of Comprehensive Tests to Evaluate College Men Football Players' Performance" was designed as a research conceptual framework as followed;

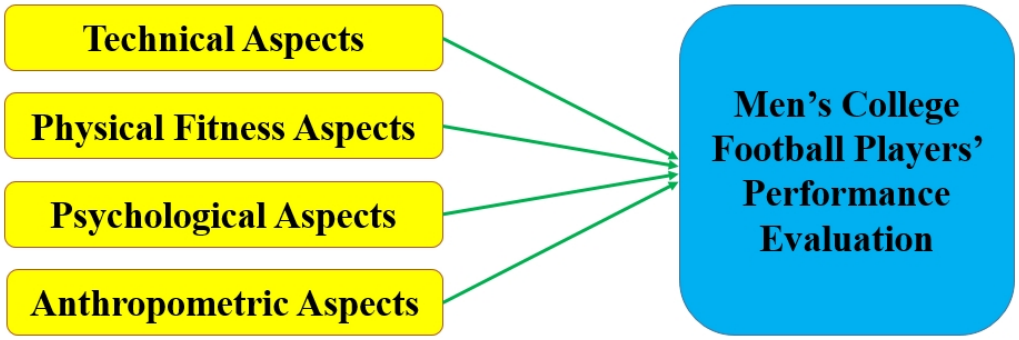

Figure 1 Conceptual Framework of factors affecting FPP

Methodology

Population and Sample Size: The target population of this study is college football players and football students in Guangdong province, the total number is approximately 3000. After physical examination, personnel who were recently injured and unable to complete the test were removed, resulting in 156 participants. Before the test, the subjects had already been clearly informed of the testing project, testing process, and potential risks, and signed an informed consent form, willing to do their best to complete this test.

Research Tools: The main test instruments in this study is the set of tests in constructed comprehensive tests including Football technical test tools, physical fitness testing tools, psychological testing tools, anthropology test tools, an in-depth interviewing form, and a questionnaire for consensus by the Delphi technique.

Research Paradigm: This study used the Delphi method, correlation analysis, and stepwise regression analysis to determine the factors that affect football performance.

Research Strategy: (1) 20 indicators affecting FPP were selected through two rounds of Delphi method and corresponding test methods were designed. (2) 156 subjects were asked to complete the test of 20 indicators. (3) Ask the teachers and coaches of these 156 subjects to rate them, and then perform Spearman correlation analysis with the test scores of 20 indicators. (4) Indicators that do not have significant correlation will be deleted. (5) Perform a stepwise regression between the remaining 15 indicators and their scores to obtain a regression equation.

Data Collection: This study used the Delphi method to obtain the data of expert scoring, measured 156 subjects on the spot obtained the test data of 20 indicators, and sorted out and analyzed the data to determine the influencing factors of football performance.

Data Analysis: This study mainly used statistics software to analyze the data. The statistics used were mean, SD, median, IQR, Pearson's correlation analysis, Spearman's correlation analysis, and Stepwise regression analysis.

Results

This research used the Delphi method, correlation analysis, and regression analysis method to analyze the technical, physical fitness, psychological, and anthropometric predictive effect on FPP.

1. Delphi Method Survey Results

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According to the results of the two rounds of the Delphi method, the indicators with a median lower than 3.5 (excluding) or an IQR higher than 1.5 are deleted. In this way, we finally got the evaluation index system of FPP that technical aspects include short passes, long passes, close-range shots, and fast dribble shots, physical fitness aspects include vertical jump, standing long jump, T-test, Illinois test, 10-meter run, 30-meter run, dominant and non-dominant foot Y balance test, 6×30 meter, and Yo-Yo IR one, psychological aspects include competitive motivation, mood state and self-confidence, and anthropometric aspects include height, Quetelet index, and vital capacity.

2. Spearman Correlation Analysis

Table 1 Spearman Correlation Analysis Results of Test Factors and FPP Score

Primary indicator	Secondary indicator	R
Technical	Short pass	0.668**
	Long pass	0.745**
	Close range shot	0.608**
	Fast dribble shot	−0.634**
Physical fitness	Vertical jump	0.284**
	Standing long jump	0.046
	T-test	−0.189*
	Illinois Test	−0.370**
	10-meter run	−0.559**
	30-meter run	−0.276**
	Dominant foot Y balance test	0.040
	Non-dominant foot Y balance test	0.028
	6×30-meter run	−0.339**
	YO−YO IR one	0.348**
Anthropometric	Height	−0.065
	Quetelet Index	0.015
	Vital capacity	0.180*
Psychological	Competitive motivation	0.331**
	Mood state	−0.288**
	Confidence	0.315**

Note: *P＜0.05, **P＜0.01

A total of 4 football teachers and coaches from 156 participants were gathered to score based on their comprehensive football performance. Excellent players score 3 points, average players score 2 points, and inferior players score 1 point. Used Spearman correlation coefficient to analyze 20 indicators score with the FPP score. From Table 1, it can be seen that the short pass, long pass, close-range shot, vertical jump, Yo-Yo IR one, vital capacity, competitive motivation, and confidence were strong positive correlations with the FPP score. The fast dribble shot, Illinois test, 10-meter run, 30-meter run, 6×30-meter run, mood state, and T-test were strongly and negatively correlated with FPP score because the above indicators were the smaller the value, the better the performance. The test scores of the standing long jump, dominant foot Y balance test, non-dominant foot Y balance test, height, and Quetelet Index were not correlated with FPP score, so removed these 5 test indicators.

3. Construct a Regression Model

The FPP scores were taken as the dependent variables, the 15 indicators that passed the correlation analysis test were taken as the independent variables, and the stepwise regression method was used to construct the prediction model.

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Table 2 Regression Model Summary

Model	R	R Square	Adjusted R Square
1	.717	.514	.511
2	.766	.586	.581
3	.783	.613	.605
4	.797	.636	.626
5	.807	.650	.639

First, after 5 iterations no new independent variables were added to the regression equation and the model stabilized. Generally speaking, if the R square value of the regression model is greater than 0.3, it indicates that the model has strong explanatory power. In this research, the R Square of the model also improved from 0.514 to 0.650, indicating that the regression model was able to predict 65% of the factors of FPP, and the fit was good. (Table 2)

Table 3 Regression Model Correlation Analysis Results

Primary indicator	Secondary indicator	R
Technical	Short pass	0.667
	Long pass	0.717
	Close range shot	0.591
	Fast dribble shot	−0.630
Physical fitness	Vertical jump	0.300
	T-test	−0.204
	Illinois Test	−0.263
	10-meter run	−0.509
	30-meter run	−0.277
	6×30-meter run	−0.337
	YO−YO IR one	0.343
Anthropometric	Vital capacity	0.178
Psychological	Competitive motivation	0.313
	Mood state	−0.281
	Confidence	0.251

Then, to test the multicollinearity between the variables of the regression model, the Pearson correlation analysis method is used to analyze the relationship between the test indicators and FFP (Table 3). It is found that the absolute value of the correlation coefficient of four indicators of technical aspects is 0.591 to 0.717, and the absolute value of the correlation coefficient of seven indicators of physical fitness aspects is 0.204 to 0.509; The absolute values of the correlation coefficients of the three indicators of psychological aspects range from 0.251 to 0.313; The correlation coefficient of vital capacity in anthropometric aspects is 0.178. The correlation coefficient between all 15 test indicators and FFP is below 0.75, this indicates no multicollinearity problem in this study. This does not violate the basic assumption of multiple regression analysis.

Table 4 Summary of ANOVA

Model		SS	df	MS	F	Sig.
1	Regression	52.951	1	52.951	163.116	.000
	Residual	49.991	154	.325		
	Total	102.942	155			
2	Regression	60.374	2	30.187	108.498	.000
	Residual	42.568	153	.278		
	Total	102.942	155			

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Model		SS	df	MS	F	Sig.
3	Regression	63.073	3	21.024	80.154	.000
	Residual	39.869	152	.262		
	Total	102.942	155			
4	Regression	65.439	4	16.360	65.868	.000
	Residual	37.504	151	.248		
	Total	102.942	155			
5	Regression	66.961	5	13.392	55.829	.000
	Residual	35.982	150	.240		
	Total	102.942	155			

The analysis of ANOVA results showed that after the completion of the fifth iteration, the regression model had F=55.829, P<0.05, indicating that at least one variable in the regression equation had a predictive effect on FPP, indicating that the construction of the regression equation was statistically significant. (Table 4)

Table 5 Regression Model Coefficients

Model	Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
	B	Std. Error			Tolerance	VIF
(Constant)	0.935	1.227	0.762	0.447		
Long pass	0.046	0.007	6.913	0.000	0.606	1.651
Fast dribble shot	-0.140	0.030	-4.644	0.000	0.612	1.635
Vertical jump	0.011	0.004	2.984	0.003	0.920	1.087
Competitive motivation	0.011	0.004	2.854	0.005	0.941	1.063
10-meter run	-0.731	0.290	-2.519	0.013	0.733	1.365

From Table 5, there are 5 indicators finally selected for the regression model long pass, fast dribble shot, vertical jump, competitive motivation, and 10-meter run. The regression coefficients of these 5 indicators passed the significance test. The regression coefficients of all 5 indicators passed the significance test. From the Collinearity Statistics, the VIF values of the selected indicators are <5, indicating that there was no Cointegration between the indicators, and the residuals are normally distributed.

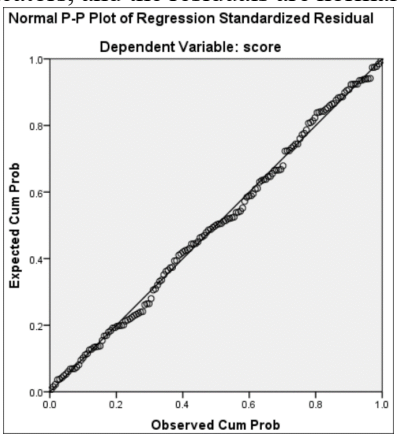

Figure 2 Normal P－P Plot of Regression Standardized Residual

Ultimately, we obtain the probability regression equations for FPP:

Y=0.935+0.046× (Long pass) －0.140× (Fast dribble shot) +0.011× (Vertical jump) +0.011× (Competitive motivation) －0.731× (10-meter run)

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It can be seen that for each unit increase in the long pass, vertical jump, and competitive motivation, the FPP score will increase by 0.046, 0.011, and 0.011, respectively. For each unit decrease in fast dribble shot and 10-meter run, the FPP score will increase by 0.140 and 0.731, respectively.

Discussion

This study attempted to identify the key factors affecting FPP and used stepwise regression to construct a prediction model for FPP. The results showed that long passes, fast dribble shots, vertical jumps, competitive motivation, and 10-meter runs were the core factors affecting FPP. This can be explained as follows:

1. Technical Aspects

The technique is fundamental to football, and the fundamental purpose of the game is to shoot the ball into the opponent's goal; every tactical act is inseparable from the football technique. The ability to maintain technical performances throughout soccer matches is considered to be crucial in determining the outcome of competitive fixtures.

Dribbling is considered a valuable skill in soccer because players have the potential to advance deeper into an opponent's territory while maintaining possession of the ball (Mark & Michael, 2011). Fast dribble shot is a very comprehensive football skill set, which not only requires the player to complete the curve dribbles quickly but also requires the player to shoot the ball into the designated area, which requires excellent dribbling and shooting ability. Related studies have also shown that dribbling was a constant determinant of elite players, both successful dribbling, prolonged possessions, and key dribbling, prolonged possessions were also higher in the elite group. (Huijgen, et al, 2009).

Most of the tests draw upon traditional coaching techniques of dribbling around cones placed 2 to 4 m away from each other in a figure-of-eight fashion (Haaland & Hoff, 2003). Using University players of differing abilities, (McGregor, et al, 1999) reported validity coefficients of R= 0.78 ($P<0.01$) and 95% confidence intervals of 0.08±6.43s; thus, suggesting this type of test to be a valid and reliable indicator of soccer skill. The regression coefficients of fast dribble shot are the largest from the specific situation of these 4 technical indicators, and one unit shortening of the time of a fast dribble shot could increase the FPP score by 0.140, this also confirms that the dribbling test method used in this study can effectively distinguish the performance of players.

Long pass is the most used technique in college football. Since the ball control ability of college players is relatively low, the long pass is the first choice of college players in many situations such as corner kicks, free kicks, clearance, long shots, and defensive counterattack. Long pass requires not only strong explosive power but also a good grasp of the skill to pass the ball far and accurately. A series of studies have shown that passing accuracy was considered an important indicator for FPP (Rampinini, et al, 2009). A study on Hungarian players shows that the stronger their long pass ability, the higher their ranking, indicating a higher level of proficiency (Miklos, et al, 2016). The regression coefficient shows that for every unit improvement in the long pass, the FPP score can be increased by 0.046, explaining that long passes can effectively improve FPP.

2. Physical Fitness Aspects

The physical fitness aspect that eventually passed the regression coefficient test was the 10-meter run and the vertical jump. Speed is one of the most important abilities in the game of football. In the game, breaking, running, defending, fighting for chances in front of the goal, everything is inseparable from speed. Without speed, the defense will be easily broken by the opponent or lost position, which will lead to the loss of the ball. When attacking, without speed, it will not be able to break through the opponent and create opportunities for the attack. In the game, the defense and attacking players basically maintain a distance of 10 meters or less, plus the existence of the offside rule, if you can't overtake the defender in a flash, then you are in danger of offside.

A study reported that 96% of sprint bouts during a soccer game are shorter than 30m, with 49% being less than 10m (Valquer, 1980). In football matches, the agility of the first 3 steps, as well as speed and speed, represent the most important athletic abilities of football players. A gap of 30-50 centimeters (0.04—0.06 seconds/20 meters) may be sufficient to play a decisive role in a one-on-one duel, as having the body/shoulders in front of the opposing player increases the chances of dribbling the opponent or successfully defending the attacker. Several studies have also shown that within 2-3 months, systematic training can improve muscle strength and neural responsiveness (Mendez-Villanueva, et al, 2008), thereby significantly improving sprint speed (Bissas & Havenetidis, 2008).

Other studies have shown that professional players have significantly better short sprint speeds than regular players (Leonardo, et al, 2013). In research on professional players in Austria and France,

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International Journal of Sociologies and Anthropologies Science Reviews (IJSASR), 3 (3): May-June 2023, page 239-250. ISSN: 2774-0366
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index
DOI: https://doi.org/10.14456/jsasr.2023.51

it was found that sprinting ability is one of the key factors determining the success of a player (Gonaus & Muller, 2012). Therefore, the acceleration and sprinting ability around 10 meters largely determines the FPP. The regression coefficient of 0.634, which is the most heavily weighted of all regression equation indicators, indicates that for every one-unit improvement in the 10-meter run, the FPP score will increase by 0.731. From these perspectives, improvements in sprint testing, especially for tests over 10 meters, may be considered worthwhile (Haugen, et al, 2014), because speed is a top priority to improve college FPP and needs the attention of coaches and teachers.

Another physical fitness indicator that enters the regression equation is the vertical jump. The vertical jump mainly reflects the explosive power of the player's lower limbs. There is a lot of jumping in football, but most of the jumps are longitudinal, which plays a key role in competing for the ball in the air, especially when competing for offensive and defensive headers. It is the most direct and effective way to score in college football when the ball is passed to the penalty area through a corner kick or a free kick to score a header. In past studies, it has been confirmed that lower limb strength is an important indicator for distinguishing FPP, many scholars have studied the lower limb strength of football players of different levels and found that the maximum lower limb strength and jumping ability of excellent athletes are significantly higher than those of the ordinary group (Papaevangelou, et al, 2012).

Excellent jumping ability has become an important factor in determining whether a player can succeed (Gonaus & Muller, 2012). Compared to abilities such as speed and balance, strength is mainly influenced by training frequency and quality. Because high-level athletes engage in regular training for a long time. During a game, professional soccer players perform about 50 turns, comprising sustained forceful contractions to maintain balance and control of the ball against defensive pressure. Hence, force and power expression are important characteristics of high-level soccer players (Wisløff, et al, 2004). Some previous studies suggest that jumping could distinguish elite young soccer players from their age-matched counterparts (Vaeyens, et al, 2006). The regression coefficient shows that for every one-unit increase in vertical jump score, the FPP score will increase by 0.011.

3. Psychological Aspects

The psychological of players is an important component of athletic performance. In football, psychologists affect players' performance, especially in important moments such as penalty kicks, where psychology determines the outcome of the game. The 3 psychological indicators are introduced into the regression analysis as independent variables, and the regression coefficients of competitive motivation passed the test, but mood state and self-confidence are excluded.

The competitive motivation that may have implications for distinguishing elite from non-elite athletes is goal orientation, which is a construct described in achievement goal theory and refers to the criteria of success individuals tend to use when they engage in achievement contexts. Competitive motivation is the internal motivation that drives people to strive for success in completing tasks and is the intrinsic drive that drives people's willingness to complete work they consider valuable. Optimal levels of motivation, motivational orientation, coping skills, and competitive anxiety are all essential factors for quality talent development.

Football is a challenging team sport, and there are many physical and psychological difficulties encountered in training and competition. Without strong competitive motivation, one is likely to be fearful and not brave enough to play football, fearing failure and learning to run away from the game. As the saying goes: the brave man wins when he meets the brave man on the narrow road. The courage to face defeat and never give up on the pursuit of success is an important factor in winning or losing a football game and is also the way to grow in determining a football player. Research has found that competitive motivation is a key factor affecting the growth of young players, and excellent players often have strong competitive motivation to strive for higher goals. (Juan, et al, 2021). Football players with a high level of intrinsic motivation are more likely to achieve success. Research has also confirmed that players with high intrinsic motivation are particularly closely related to success (Zuber, et al, 2014).

Competitive motivation is the only psychological indicator tested by regression analysis, with a regression coefficient of 0.011, indicating that for every unit increase in competitive motivation, FPP well improved by 0.011.

4. Anthropometric Aspects

In the original design, the anthropometric measurements contained 15 indicators. After consulting with experts, 5 indicators are removed. During the Delphi process, 7 indicators had a median score below 3.5 and needed to be removed, and only 3 indicators are retained: height, Quetelet index, and vital capacity.

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When correlation analysis was performed, the height and Quetelet index indicators did not pass the significance test with correlation coefficients of only 0.065 and 0.016, and had very low correlation with FPP, and are therefore removed. Ultimately only vital capacity was introduced into the regression analysis. In the regression analysis, vital capacity eventually failed the test of regression coefficients, and since then the indicators of the anthropometric domain are all excluded.

Recently, a study measured the anthropometric characteristics of college football players and found that there are no differences between elite and regular players in many indicators such as lower limb length and leg circumference (Timothy, et al, 2021). In a study of outstanding female football players, it was also not found that there are differences in anthropometrics among players of different levels (Ingebrigtsen, et al, 2011). Many studies have only proven the differences in anthropometrics between players in different positions, such as goalkeepers being higher than players in other positions, and center-backs being higher than full-backs and midfielders, but have not confirmed that anthropometrics can effectively distinguish FPP (Williams, et al, 2000).

In conclusion, anthropometry should mainly be conducted during athletes' infancy and adolescence, especially for college students who have already completed their physical development and are not well used to evaluate college FPP.

Recommendations

1. Recommendation for Policies Formulation

The results of this study indicate that FPP is a complex matter that requires systematic and multidimensional evaluation. Therefore, relevant departments, schools, football coaches, and teachers cannot evaluate FPP solely based on technical or physical measurements when selecting or evaluating football players. Instead, multiple factors need to be integrated to accurately select outstanding football players and evaluate FPP.

2. Recommendation for Practical Application

This research revealed the relationship between football technical, physical fitness, anthropometric, psychological factors, and FPP, and found that there is little correlation between anthropometric factors and FPP among college students. Therefore, college football coaches and teachers should pay more attention to the training of football technical, physical fitness, and psychological abilities during training. Especially for long passes, fast dribbling, lower limb strength, 10-meter speed, and competitive motivation training. I hope that the results of this study can help football teachers and coaches develop scientific teaching and training plans, provide guidance, and improve FPP. The use of the prediction model in this study can also help them scientifically and accurately select athletes with potential.

3. Recommendation for Further Research or Study

Although this study has designed a set of scientific and rational evaluation criteria for FPP through a series of rigorous procedures, some shortcomings can be appropriately considered in the following three directions in future research.

First, some high-tech measurement items are needed for FPP. For example, a wearable GPS intelligent tracking sports undershirt, which is equipped with GPS, heart rate belt, axis accelerometer, gyroscope, and other instruments, after wearing it coaches can measure the players' heart rate, pulse, running speed, emotional changes, and in the background at any time show the FPP all digitally and precisely. Currently, this equipment is widely used in professional and semi-professional clubs, and some well-equipped universities in China have also started to use this equipment.

Second, increase the quantity and quality of samples. The 156 samples in this study are all from a single university. If the sample size can be further increased, especially to add more samples from other regions and higher levels, it will improve the accuracy of the comprehensive evaluation of FPP.

Third, choose newer test items. With the development of football new test items and test methods need to be developed. Especially, many professional youth football clubs' novel, effective FPP measurement methods are worth learning and using in the comprehensive evaluation of college FPP.

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International Journal of Sociologies and Anthropologies Science Reviews (IJSASR), 3 (3): May-June 2023, page 239-250. ISSN: 2774-0366
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