

# Design and Application Effect of Physical Training for Football Preparation Match Based on Plate Cycle Theory (Empirical Study on Chinese Professional Football Club)

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**Abstract:** Purpose: Combined with the theory of the previous plate cycle research and its application in the physical training of sports teams, actively explore the application scheme and effect of the plate cycle theory in the physical training of Chinese professional men's football teams, find the problems in the physical training of professional clubs and put forward suggestions. Methods: Using literature data method, expert interview method, experimental method and mathematical statistics, etc. In the preparatory physical training plan of Sichuan Minzu Football Club, for the 2021 Chinese FA Cup match and the 2021-2022 season China Football Second Division League, the physical fitness data of the team members before and after the training were collected for comparison and analysis. Results: 1.4 weeks aerobic and strength small cycle plus 2 weeks strength and aerobic small cycle constitute the accumulation cycle of the physical training; 4 weeks explosive force small cycle constitutes the conversion cycle; 1 week maximum speed and tactical training small cycle constitute the realization cycle. 2. From the comparison of the physical test results before and after the training, the sensitive test results improved significantly, statistically significant ( $p < 0.01$ ), the 10 m acceleration, 30 m acceleration, vertical jump test and yo-yo test results also increased to varying degrees, and the hypothesis test showed statistical significance ( $p < 0.05$ ). Conclusion: The application of the plate cycle theory in this physical training is more scientific and reasonable, which can relatively effectively improve the physical quality of football players. Suggestions: Strengthen the monitoring of athletes' physical quality, widely promote the use of periodic training plans in football preparation, diversify and tailor periodic physical training plans and combine training with the state of athletes, so as to make the training more reasonable, scientific and systematic.

**Keywords:** Plate cycle theory; Professional football player; Physical training program.

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## 1. INTRODUCTION

### *Origin and Development of Training Staging Theory*

It is a clear sign of the scientific and systematic contemporary sports training to make a long-term training plan according to the individual situation of the training objects, the competition target and the mechanism of the development of various human abilities. The "staging" and "plate" staging training theory, created by the former Soviet Union Matviyev and Verhoshanski in the 1960s and 1980s, is a classic work leading the long-term planning mode of sports training.

In the course of the development of competitive sports training, the theory of "training staging" created by the former Soviet Union Matviyev (L.P. Matveyev) occupies an important position, and to some extent, it can be said to open a new era of world competitive sports training from micro to macro and from scattered to systematic. In the 60 years since the theory of staging training, it has been active on the stage of competitive training. It is not only the basis and basis for

coaches to make training plans, but also an important content and hot issue of sports training and scientific research. Training stage refers to a number of training time series with specific training content and load aiming to establish the optimal competitive state of the trainee. It is also believed that the training stage is a logical and phased training control process to achieve the special ability goal, with the aim of tapping the athletes' potential.

The training staging theory was created by the former Soviet Matwiviev in the 1960s. His research began in the early 1950s, its background is the Soviet union is preparing in 1952 in Finland, Helsinki 15th Olympic Games, because this is the first group since the founding of the Olympics, so the Olympic Games as to show the world the overall strength of the window, attaches great importance to by the country. Matwiyve and his team worked in the national team's swimming, weightlifting, and track events, and followed a series of preparations for world championships through the 1960s. He from the level of philosophy, methodology and biology of thousands of outstanding athletes training is summarized and analyzed, and on the basis of the experience and theory, in 1962 put forward the training staging theory (Periodization of Sports Training), in 1964 officially published the "sports training staging" (Periodization of Sports Training) monograph, marks the staging training theory.

### ***The Origin and Development of Plate Theory***

Since the establishment of the "plate" staging training theory in the former Soviet Union in the mid-1980s, it soon attracted the attention of the world competitive training field. In 1985, the former West German translator Schner published a summary of the book "The Change of annual Training Cycle", a famous coach of the former Soviet Union, and the following year he translated the book into German, which was the first time that the concept of "plate" was spread to countries outside the former Soviet Union. Since then, Schner has successively translated many articles and works of Verhoshanski, the founder of plate training theory, into German and published them in the former West German, and his views and theories were highly valued by the former West German training scholars. In the training monographs published by Martin and Howmann, famous German sports training scholars, "plate" staging training is regarded as an important view and development trend of long-term sports training plan and control theory, and believes that this theory is a supplement and development to Matviev's staging training theory. The Spanish scholar Mukileca (I. Mujika) The training idea of "plate" is widely quoted in his monograph "Pre-competition Reduction and the Peak of the Best Competitive State" (Tapering and Peaking for Optimal Performance). In his opinion, the current world competitive training mainly adopts two different modes from the traditional stage training. The first is called "cycle" training mode, it is not a year as a cycle, but according to the game will be divided into several relatively independent cycle, in each cycle is divided into preparation period, game period and transition period, the training mode is the biggest characteristic of the specific training target, training methods and load more targeted, competitive ability can appear multiple peak. The second is called "plate staging" training, which is a training mode with load concentration benefits. It divides each "plate" into accumulation period, transformation period and realization period, and the length of each stage depends according to the importance of the competition. In each stage, the content and requirements of the training are different. For example, if the aerobic training is conducted during the accumulation period, the lactate tolerance will be trained during the transition period.

### ***The Emergence of the Plate Cycle Theory***

The emergence of plate staging theory is refined by the American competitive training community, which must be mentioned is the professor Dr. Yesth of the University of California (M. Yessis), who had long been the editor of The Fitness and Sports Review International and Soviet Sports Review journals and translated several monographs and papers of former Soviet scholars, including those of Verhoshanski, Bondacucko and Isulin. In recent years, the professional sports training of football, baseball, ice hockey and basketball in the United States has also absorbed a lot of training ideas and methods from this theory. These programs known for high intensity confrontation, high frequency competition and high injury risk have put forward higher requirements for training. Nick Winkelman (Nick Winkelman), who has long been doing physical training in such events, said, "In traditional staging training, athletes only need to play their best abilities in one or two competitions a year, while modern competitions run throughout the year, with multiple peaks throughout the year. So we need new models to adapt to this schedule and keep athletes high throughout the year."

In recent years, the world competitive training field has also begun to try to conduct experimental research on the plate staging training theory. Spain's Georgia-Parlaris (J. Garcia Pallares) et al studied the longitudinal training of 10 elite men kayakers, the results show that, Although traditional staging training took longer than plate staging training, Athletes trained in two training modes did not show significant differences in the maximum and the second ventilatory threshold oxygen intake measures, However, in the paddle frequency, paddle speed and power of the maximum oxygen uptake, Plate staging training players are significantly better than the traditional staging training players, therefore, The study concluded that, The plate training staging mode improves the competitive ability of high-level kayakers than the traditional training staging. Ronstad, Norway (B.R. Rnnestad) And others also conducted a series of studies on traditional staging and plate staging training. They used high-intensity interval training (high-intensity training, HIT) as the "plate" insertion training, and tested the training effect of the two different modes, with the same average training time, load, intensity and different intensity distribution. Their research results showed that for both well-trained cyclists and excellent cross-country skiers, the training effect of plate staging training was significantly better than that of traditional staging training in terms of maximum oxygen uptake and power.

Plate staging training theory provides us with a new training idea and method different from Matviev training staging theory. Although it still inherits the framework structure of "staging" in form, and also follows the stage division of traditional staging within a staging system, it has supplemented and reformed the traditional training staging on the basis and content. It is not from the "general and special training" and "training and intensity" macro perspective of the training process, but from high level athletes competitive ability "plastic space" gradually narrowed, special performance increasingly slow, the contradiction between training load and sports injury increasingly characteristics, put forward the concept of "highly concentrated specialized load training". The concept broke through the traditional stage training in a variety of ability "comprehensive, uniform distribution and synchronous development" way of training, put forward to less target ability concentrated specialized training, both accurately and efficiently develop the sports ability, and as far as possible to avoid or reduce the excessive training caused by increased training load and the risk of sports injury, opened up a new path for high level athletes training.

Plate stage training theory of another bright spot is that it has a relatively solid sports biology background, attaches great importance to "adaptation" theory of competitive training, emphasize the balance between training and recovery, explicitly put forward different ability of "training trace effect", and as the development of various ability, choose training means and determine the "plate" duration and the basis of cohesion and basis to each other.

With "cycle" as the basic structure of the plate stage training mode of "minus" training theory research and development has important influence, it is based on the "trace effect" is also an important basis of the competitive state, its accumulation, transformation, implementation and "core training" and "micro plate" training unit on the operational level for pre-game training has injected new content.

The combination of theory and practice is another characteristic of the plate training mode. The theory for coaches planning from micro (each training) to the macro (training plan) training framework, and the framework gives the specific objectives, tasks, principles and training content, design such as "core load" "core training" and "micro plate" and so on a variety of different specifications of the training unit, coaches can according to the characteristics of the project, the training stage and the specific situation of athletes selection and combination, and can be made in the implementation process of adjust, greatly facilitate the practical operation and application of the coaches.

Isulin's book "—— Innovative Breakthrough in Sports Training" is clearly presented. In his view, "many factors proposed at that time are still guiding training, including hierarchical taxonomy and training cycle terms, the definition of general and specific training preparation, training volume and intensity, and basic training methods for short, medium and long-term plans." At the same time, he also believes that "it is obviously unrealistic that we expect the theory proposed 40 years ago to still apply to our training, so some original training principles are no longer applicable to the current plate staging training method." Therefore, "traditional staging training is still applicable to the training of general level athletes, but is not suitable for the training of high-level athletes". Thus, the classic stage and plate stage is not two different or opposite theory, we can imagine, if there is no Mr and his team fruitful work, there will be no Mr and others plate stage training ideas, the formation of plate training theory is undoubtedly based on the former, is in a local, the high level athletes training, put forward their own academic views and ideas.

The contents of the two training theories are analyzed in Table 1 below.<sup>m</sup>

	design feature	Classic staging	Plate stage
1	application area	All athletes	high performance athlete
2	Scientific basis	The cumulative training effect	Accumulation and training trace effects
3	ability development	Multiple capabilities will develop simultaneously	A few capacities were developed in turn
4	Load characteristics	Full stimulation	Concentrated stimulation

pour : According to the Issurin, 2007 adaptation

Although the plate cycle theory has greatly promoted and promoted the development of competitive sports training, it still cannot fully meet the changing needs of training practice, and still cannot completely solve all the problems in the development of long-term competitive ability and short-term competitive state regulation of athletes. It still needs to continue to study and improve. For high-level football players, the preparation period is getting shorter and shorter. According to the traditional training methods, for the athletes who train systematically all the year round and participate in the formal competitions, the body will gradually adapt to the stimulation of the preparation training, making it difficult for the athletes to achieve the desired effect in a short time. In football special, physical ability is the basis and the most important supporting factor of technology, skills and tactical execution. Through effective physical training, the athletes can better complete the various technical and tactical arrangements of the coaches under the support of high-level physical fitness. This study intends to design a more targeted, specialized and intensive plate cycle training program, and verify its practical application effect in improving the physical fitness of professional football players in the preparation period.

## 2. METHODS

### *Plate Cycle Concept*

Plate cycle theory refers to the division of a complete training stage into three cycles: accumulation, conversion and realization. Each cycle is about 1 to 5 weeks, and the coach conducts targeted training for a certain exercise or a certain type of quality according to the needs of the team. Each single cycle can be divided into different small cycles according to different requirements, but it should be reasonably connected with each other. The complete process of the combination and competition is called a complete training stage. The length of each plate cycle can be adjusted according to the length of the preparation period, so that athletes can directly participate in the competition even after the end of the short preparation period, which has obvious advantages compared with the traditional training theory. The connection during each week can avoid the mutual interference and overtraining caused by the multi-factor training easily appeared in the traditional training theory, so as to achieve the purpose of improving the competitive performance and sports performance.

### *Physical Training Concept*

Physical ability refers to the basic sports ability shown by strength, speed, endurance, coordination, flexibility, sensitivity and other physical qualities, and is an important component of sports competitive ability. The level of physical fitness is closely related to the morphological characteristics and the functional characteristics of the human body. Physical training can be divided into: general physical training and special physical training. General physical training refers to the comprehensive development of athletes' physical quality, which lays a solid foundation for professional sports skills during the competition. Generally speaking, it is the comprehensive development of strength, speed, endurance, sensitivity, and flexibility. Special physical training refers to the formulation of scientific and professional training plans according to the characteristics of sports events, so as to improve the physical quality and ability of athletes.

### *Participants*

In this study, the players of Sichuan Minzu Football Club in the China Football Second Division League were the study object, and the physical training method was applied to the training plan of the 2021-2022 season. Design, organize and arrange the main content and framework of physical fitness in the training of the team members in the preparation period, evaluate the changes in the physical fitness level of the team members before and after the complete plate cycle training

and conduct mathematical analysis, and conduct an empirical study on the effect of the theoretical physical fitness training plan of the plate cycle theory.

### *Statistics*

### *Literature Method*

In this study, more than 20 papers on football physical training in multiple databases. Through collation, induction, the contents, measures and research status of plate cycle theoretical training, football physical training plan, physical training plan arrangement are analyzed, etc., which are used as a theoretical reference for the study of physical training design and the formulation of plate cycle physical training plan in this study. At the same time, organize and summarize the materials related to the training plans and teaching plans of the plate cycle theoretical training and football physical training, and determine the content arrangement of the cycle and plate in the training plan of the preparation season.

### *Expert Interview Method*

Through the selection, we interviewed well-known scholars and front-line coaches in the field of physical training and willing to try the plate cycle theory as experts to evaluate the scientificity and practicability of the planning and indicators of this study. Experts include Cao Xiaodong, the physical coach of the U21 men's football team, and Cao Tianbao, Former Chinese national men's football team player, former head coach of Sichuan Minzu Football Club, and now head coach of Changchun Shenhua Football Club.

### *Test Method*

Before and after the implementation of the whole plate cycle training, the physical quality of the team members was measured, that is, compared with the changes of the quality indicators before and after the plate cycle physical training, to verify the effect of the plate cycle physical training on improving the physical quality of the team members. The measured indicators are 10 m acceleration, 30 m acceleration, sensitive test, vertical jump test and YO-YO test. Speed of 10 m and 30 m is the important basic quality of football; sensitive and vertical jump test reflect the explosive power and sensitive coordination ability of athletes, namely the multi-dimensional sports ability of football; YO-YO test can directly reflect the aerobic special endurance ability of teammates.

### *Mathematical Statistics*

After preliminary exploration, it was learned that the physical fitness indicators of 10 m acceleration, 30 m acceleration, sensitive test, longitudinal jump test and YO-YO test were approximately distributed normally distributed, so the mean  $\pm$  standard deviation ( $\bar{x} \pm S$ ) was used for statistical description, and the difference between the mean before and after the indicators was compared by paired design t-test. In this study, Excel was used for data collation, and statistical analysis was performed using IBM SPSS 23.0, and the test level for statistical inference was set at 0.05.

## 3. RESULTS

### *Physical Fitness Training Design Ideas*

Table 2 intuitively shows the different training objectives, loads and intermittent arrangements of the three cycles of plate cycle theory. In the design of the plan, the training should be planned reasonably and scientifically in strict accordance with the characteristics of the plate cycle theory and the preparation time before the competition, so that the training can be carried out in a more efficient, compact and purposeful direction in the implementation process.

The training period for this time is from July 2021 to September 2021, which is the pre match training period for Sichuan People's Football Club to prepare for the 2021 China Football Association Cup 32 in 16 and the second stage of the 2021 China Football Second Division League. During the training period, the sports team was trained with the plate cycle physical training plan and arrangement. According to the practical implementation method of plate cycle theory training, the physical training plan of the whole preparation period is set into three cycles of accumulation, transformation and realization.

	accumulation	change	realize
training objective	Basic ability (Strength and endurance)	special ability (Explosive power and special ability)	Prepare for the game (Motor performance ability)
Load and intensity	High load and low strength	The intensity of the load reduction increases	Medium and low load and high strength
Fatigue and recovery	Adaptive recovery phase	Ability improvement, fatigue accumulation stage	Special promotion and recovery rest stage

### Physical Training Program Arrangement

#### Accumulate a Cycle Training Program

The accumulation cycle is required for relatively high load training at relatively small intensity. Specifically refers to the restorative training to stimulate the team members in the psychological and physiological recovery of basic ability for the purpose, for muscle strength, endurance and other physical fitness elements training. Fully mobilize and develop the aerobic and anaerobic capacity of the team members.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
morning	Train content	Aerobic endurance(replaceable)	Aerobic endurance	Maximum force	Maximum force(replaceable)	Aerobic endurance	Maximum force(replaceable)	rest
	Load capacity	Submaximum	Submaximum	large	secondary	large	Submaximum	nothing
afternoon	Train content	Maximum force(replaceable)	rest	rest	Aerobic endurance (replaceable)	rest	rest	rest
	Load capacity	secondary	nothing	nothing	Submaximum	nothing	nothing	nothing

Table 3 shows the training physical fitness design scheme of aerobic and strength small cycles. The main training method is the aerobic exercise with the total intensity approaching the lactic acid threshold intensity as the main training method. During the training process, the physical fitness coach should timely monitor the physiological indicators of the team members and implement the requirements to achieve the goals and requirements.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
morning	Train content	Aerobic endurance(replaceable)	Aerobic endurance	Maximum force	Maximum force(replaceable)	Aerobic endurance	Maximum force(replaceable)	rest
	Load capacity	Small	large	large	secondary	secondary	Submaximum	nothing
afternoon	Train content	Maximum force(replaceable)	rest	rest	Aerobic endurance(replaceable)	rest	rest	rest
	Load capacity	secondary	nothing	nothing	secondary	nothing	nothing	nothing

Table 4 shows the training physical fitness design scheme of strength and aerobic small cycle. There was no obvious change in the arrangement and organization of the training from before, but in this small cycle, more resistance strength practice became the main content of the training.

The combination of the above two small cycles constitutes the entire accumulation cycle of training. Reasonably arrange the composition of the recovery, adaptation, impact and other functions between the two small cycles within the cycle,

and grasp the reasonable connection between each other. This aerobic and power cycle lasted for 4 weeks, followed by the aerobic and aerobic cycle for 2 weeks, a total of 6 weeks of plate cycle accumulated.

### ***Transformation Cycle Training Program***

The main feature of the transformation cycle is to solve the problem of converting the basic ability acquired in the last cycle into special physical ability and improving the explosive power of the team members.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>morning</b>	<b>Train content</b>	Explosive power	Explosive power	Recoverability train	Explosive power	Explosive power(replaceable)	Explosive power	rest
	<b>Load capacity</b>	Submaximum	Submaximum	Submaximum	large	Submaximum	large	nothing
<b>afternoon</b>	<b>Train content</b>	Maximum force (replaceable)	Maximum force (replaceable)	rest	Recoverability train	Recoverability train	rest	rest
	<b>Load capacity</b>	secondary	secondary	nothing	secondary	secondary	nothing	nothing

Table 5 shows the training objectives and types in the small cycle of explosive power, and the core is to develop the explosive power as the leading goal. Gradually increasing the proportion and intensity of anaerobic training, forcing the metabolic pressure to increase the difficulty of the special technical and tactical ability to play, but also more consistent with the actual competition. In the transformation cycle, the anaerobic metabolic capacity and psychological adjustment capacity should be appropriately improved appropriately. Due to the gradual increase of the training intensity, the accumulation of fatigue is more prominent in this cycle. In the implementation of the training, attention should be paid to the physical data monitoring of the team members to avoid the negative consequences caused by excessive fatigue, and the restorative training should be reasonably inserted, and attention should be paid to the relaxation massage, ice water bath, physical therapy and nutritional supplements after the training. This transformation cycle consists of 4 weeks of small explosive force cycle and high-intensity training.

### ***Implement The Periodic Training Program***

In terms of load arrangement, the realization cycle can also be called the pre-race reduction training, or the excessive recovery period. In terms of training purpose, the realization cycle is mainly to obtain the peak of the current competitive ability, and apply the physical abilities improved by the previous training into the special skills, so as to improve the final performance ability of competitive sports.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>morning</b>	<b>train content</b>	enthusiasm recovery	Maximum speed	Maximum speed	rest	rest	Explosive power (replaceable)	rest
	<b>Load capacity</b>	Medium or small	Submaximum	large	nothing	nothing	secondary	nothing
<b>afternoon</b>	<b>train content</b>	rest	Explosive power(replaceable)	enthusiasm recovery	Maximum force	rest	rest	rest
	<b>Load capacity</b>	nothing	secondary	Medium or small	Submaximum or large	nothing	nothing	nothing

Table 6 shows the objectives and types of small cycles. The focus of physical training is to maintain a good body and metabolic state, and to prepare for the final tactical drill and subsequent formal competition. Strength training plays an important role in the pre-race cycle design. In the past training concept, the strength training in the pre-match period will increase the fatigue or affect the state of the game. However, some current physical direction frontier studies have confirmed that the appropriate strength practice during the training period is negatively related to the fatigue response

of the players during the competition. The necessary muscle dimension increase exercises can also adjust the body hormone level of the players, which has a positive effect on the performance of the game. The main form is the intensity load for the medium level, fully related to the competition skills and tactics of the team practice. With the maximum speed and tactical training small cycle constitute the whole realization cycle, the whole realization cycle time is 1 week. After the end of the realization cycle, the whole preparation period training was completed.

### Results

According to the theory of plate cycle, the entire plate cycle training includes the competition part. The competition and competitive results are the ultimate training goals. Therefore, after completing the prepared competition, the periodic physical training of this training session is officially concluded. The goal of this training session is to participate in the 2021-2022 Chinese Football Association Cup semi-finals and the second stage of the Chinese Second Division League. Sichuan Minzu Football Club has completed the best ranking of the Chinese Second Division Club in the current season's Football Association Cup competition and successfully relegated to the Chinese Second Division League, achieving the club's preset goals and meeting the club's performance requirements.

## 4. DISCUSSION

### *Physical Fitness Training Design Ideas*

#### *Screening Of Physical Fitness Testing Indicators*

The measurement standard of this study is set by combining theory with practice. After communicating with the relevant football physical fitness researchers and front-line coaches, the measurement results can reflect the physical fitness status of the players more scientifically. In football, there are three types of physical qualities that make the decision: strength, speed and endurance. The 10 m and 30 m acceleration reflect critical speed ability; the sensitive and vertical jump tests reflect sensitive, burst and multidimensional motion ability; the YO-YO tests reflect specific aerobic endurance levels. Therefore, five test contents were selected, and the players conducted two physical assessments on the first day of the preparation period and after the competition, and the data were compared and analyzed, so as to evaluate the effect of the physical training plan of this design.

#### *Physical Fitness Testing Status Before Intensive Training*

The initial test data in Table 7 is obtained through detection. From the distribution of the data, the largest variability is the vertical jump test, followed by 30 m acceleration, and the YO-YO test has the smallest variation. It shows that in this intensive training, it is necessary to focus on the development of athletes' explosive power and multidimensional sports ability and other physical qualities, which provides guidance for the direction of the training content.

test item	$\bar{x} \pm S$	coefficient of variation (CV)
10 Meter acceleration	1.793±0.09s	19.92
30 Meter acceleration	4.21±0.16s	26.31
The longitudinal jump test	61±0.82cm	74.39
Sensitive test	15.8±0.74s	21.35
YO-YO test	Class 16 ± Group 3	5.33

#### *Physical Fitness Test And Comparison Before And After Training*

The comparison of the longitudinal jump test results before and after intensive training is shown in Table 8. It can be seen from the table that the result of the longitudinal jump test is nearly 4cm higher than before after intensive training. The statistical significance ( $P < 0.05$ ), indicating that the physical training of the plate cycle can promote the jumping ability of the team members, and the target ability of absolute strength and relative strength can be improved.



testing sequence	number of people	x±S	t	P
Before the training	21	61±0.82	7.32	0.031*
After training	21	65±0.73		
Note: * Statistically significant				

As can be seen from Table 9, the performance of 30 meters increased by 0.3s, and there are statistical differences ( $P < 0.05$ ). It can be seen that the physical training of the plate cycle can improve the ability of football players to accelerate 30 meters on the field. Combined with the 10-meter acceleration data, the team members' short-distance special acceleration ability has been effectively improved. The special oxygen-free lactic acid capacity and speed strength have been better improved, which is conducive to the improvement of the target ability of speed capacity.

testing sequence	number of people	x±S	t	P
Before the training	21	4.21±0.16	5.17	0.041*
After training	21	4.19±0.11		
Note: * Statistically significant				

The comparison of the 10-meter acceleration performance before and after the training is shown in Table 10. It can be seen from the table that the 10-meter acceleration performance increased by 0.06s higher than before. It shows that through the plate cycle physical training, the players' ability to accelerate the 10 meters on the field has been improved. The hypothesis test is statistically significant ( $P < 0.05$ ), so it can be seen that after the physical training of the plate cycle, especially in the key training of the outbreak cycle, the team members' ability to accelerate the 10 meters can be actively improved.

testing sequence	number of people	x±S	t	P
Before the training	21	1.813±0.09	5.18	0.036*
After training	21	1.751±0.07		
Note: * Statistically significant				

For the measurement of sensitive quality, the original evaluation basically adopts the methods of return running and linear acceleration and deceleration. This time, the Lllinois sensitive test is closer to the special sports mode of football. From Table 11, we can see that the performance of the sensitive test increased by about 1 second compared with the previous one. The difference between the mean performance of the sensitive test was statistically significant ( $P < 0.01$ ), indicating that the sensitive quality of the team members was significantly improved through the plate cycle physical training. From the perspective of sports performance, the sensitive quality shows the good strength and neuromuscular conduction ability of the athletes. Explosive force, reaction ability and the greatest power are all the elements that affect the special and sensitive quality of football. Therefore, the sensitive test also proved that the plate cycle physical training in the preparation period took into account more target and target ability training.

testing sequence	number of people	x±S	t	P
Before the training	21	15.8±0.74	9.32	0.008*
After training	21	14.9±0.57		
Note: * Statistically significant				

The special endurance level test project chooses the YO-YO test method, which can intuitively show the characteristics of football sports. As can be seen from Table 12, the performance of the team members before this training is  $16 \pm 3$ , that is, it generally stops after completing 3 round runs in level 16, and the average result after the training is about  $17 \pm 1$ , that is, it generally stops after completing 1 round run in level 17. It shows that after the physical training of the plate cycle, the special endurance level has been significantly improved, and the difference is statistically significant after hypothesis testing ( $P < 0.05$ ), which indicates that in the accumulation and transformation cycle, the special aerobic endurance target target ability of the team members has been correspondingly improved.

testing sequence	number of people	$\bar{x} \pm S$	t	P
Before the training	21	Level $16 \pm 3$		
			3.36	0.047*
After training	21	Level $17 \pm 1$		
Note: * Statistically significant				

## 5. CONCLUSION

### Conclusion

1. After literature summary and expert consultation, this study developed a physical training plan suitable for the plate cycle theory for the football preparation. This cycle consists of 4 weeks of small cycle of aerobic and strength plus 2 weeks of strength and aerobic small cycle of 6 weeks of physical training accumulation cycle; 4 weeks of explosive force small cycle of transformation cycle; 1 week of maximum speed and tactical training small cycle of realization cycle. It forms the whole plate cycle of theoretical physical training and three plate cycles.
2. The research test, through the whole full cycle of the physical testing data comparison, the players in the longitudinal jump test, 30 meters, 10 meters acceleration, sensitive test, YO-YO test results are significant difference ( $P < 0.05$ ), this means not only for 21 training samples, for all the football players may participate in the training, complete the plate cycle theory of physical training, ability are improved.
3. The plate cycle physical training design of this design is worth promoting and has certain reference significance. The evaluation results show that the arrangement and organization of the physical training in this plate cycle are more scientific and reasonable, which can effectively improve the basic physical quality of the special football athletes and achieve the expected training effect required by the club. It can be applied to the relatively short preparation of the competition period, so as to promote the comprehensive competitive level more efficiently. More empirical research on the cycle theory of the theme section of this paper is suitable for combining theory with practice to promote the level of football special physical training.

### Insufficient Research And The Direction Of Future Research

This study explores the design and application effect of football preparation physical training based on plate cycle theory. However, there are still three shortcomings: (1) This study is only focused on the preparation period training of the Sichuan People's Football Club in the Chinese Second League, and the internal authenticity is good. However, limited to professional league competition tasks, in order to infer other types of reserve matches, it is necessary to expand the sample size to ensure external authenticity.(2) This study belongs to its comparison of experimental research, although the results prove scientific and effective, it is concluded that the cycle training plan helps to enhance the level of high level athletes physical quality, but confirmed the training effect is far better than traditional training way, the future need to completely randomized parallel control test, to further explore the plate cycle training theory of physical training uniqueness and innovation.(3) In this study, the plate cycle training program is more suitable for high-level athletes, or athletes with perennial sports training experience, for shortening the training cycle and emphasizing relatively specific training programs in each cycle. The training plan of non-professional or amateur sports teams should take into account the actual competitive level and ability.

**Propose**

This study in the actual professional football training using the plate cycle theory to design and practice, explore the professional football club plate cycle of physical training program, and expounds the plate cycle and the plate of physical training arrangement, in the form of data measurement confirm the actual effect of the plan. It is suggested to strengthen the monitoring of athletes' quality in all aspects, and arrange periodic training plans accordingly. The training forms should be diversified, and special periodic physical training plans should be tailored, and combined with the state of athletes, so as to make the training more reasonable, scientific and systematic. The promotion of new ideas and new methods needs more practices and cases to verify, and the development of Chinese football and even the whole sports cause needs a long time to work more. It is hoped that more coaches can actively use the plate cycle theory to design and arrange the future training, so as to promote the integrated development of theory and practice in the field of Chinese football. Unswervingly unswervingly take the road of reform, innovation and development, further emancipate the mind, integrity and innovate, and constantly improve the development path of Chinese football training system.

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