

A Study on the Bidirectional Drive between the Chinese Women Volleyball Team's New Developing Trends of Competitive Level and New Models of Physical Fitness Training—Women Volleyball's Competition Results in the Recent Four Olympic Games as an Example

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Abstract. With methods of the literature researches, mathematical statistics and logical analysis, a comparative study is carried out to analyze the important competition data of the recent four Olympic Games (from the 28th to the 31st) which Chinese women's volleyball team and other strong world women volleyball teams (Brazil, Russia, America and Cuba) once took part in. The study finds out that the new developing trend of the world's five strong women volleyball teams' competitiveness shows mainly in the following two aspects: the training of the world women volleyball tending to be more masculine and the increasing proportion of serving points in the world women volleyball competitions. Meanwhile, it also verifies the three new models for the construction of Chinese women volleyball players' physical fitness training: the athlete's individual excellence to the sports team's overall excellence; the understanding of the construction and deconstruction of volleyball technical models based on the tradition and innovation of volleyball tactics; the construction of the scientificity of physical fitness training, according to the individuality of athletes, the characteristics of specific sports events and the comprehensiveness of sports events. In the end, it points out that the two-way complementary between the new developing trends of competitive level and the new model of physical fitness training Chinese women volleyball's teams is the key to further enhance Chinese women's volleyball team's competitive level.

Introduction

In the 2004 Athens Olympic Games, Chen Zhong and the Chinese women volleyball team under his guidance tenaciously won the gold medal with no fear of the tough situation and strong opponents, which presented a nearly perfect volleyball game and showed what a mature team was. But after that match, the Chinese women's volleyball team's performances in the following two Olympic Games, and even in other various major competitions were quite disappointed: in the 2008 the Beijing Olympic Games the bronze medal, and in the 2012 the London Olympic Games the fifth place. In the 2016 Rio Olympic Games, the Chinese women volleyball team won the gold medal with a difficult reversal. From 2004 to 2016 the four Olympic Games, Chinese women's volleyball

team won the Olympic champion twice and lost it twice. The ups and downs of achievements is worth rethinking profoundly by all the coaching staff: why the same one national team perform quite differently in the successive Olympic Games? Do the players themselves not play perfectly or do the coaches not analyze at-the-spot competitions accurate enough?

A comparative study is carried out to analyze the important competition data of the recent four Olympic Games (from the 28th to the 31st) which Chinese women's volleyball team and the other strong women's volleyball teams (Brazil, Russia, America and Cuba) once took part in. It points out that the two-way complementary between the new developing trend of competitive level and the new model of physical fitness training Chinese women volleyball's teams is the key to further enhance Chinese women's volleyball team's competitive level.

An analysis of the Overall Competitive Level of the Chinese Women's Volleyball Team and Competition Results in the Recent four Olympic Games

Competition Results of Chinese Women's Volleyball Team in the Four Olympic Games and Corresponding Analyses

It can be seen from Table 1: the Chinese women volleyball team's performances in the four Olympic Games are quite different. Although it won the championship in Athens and Rio Olympic Games twice, failed to enter the semi-finals of the 2012 London Olympic Games. Its stability has yet to be improved, which has both advantages and disadvantages.

Table 1. The List of the Top Four Women Volleyball Teams in the 2004-2016 Olympic Games [1].

| The Olympic Games | The first place | The second place | The third place | The fourth place |
|-----------------------|-----------------|------------------|-----------------|------------------|
| Athens Olympic Games | China | Russia | Cuba | Brazil |
| Beijing Olympic Games | Brazil | America | China | Cuba |
| London Olympic Games | Brazil | America | Japan | South Korea |
| Rio Olympic Games | China | Serbia | America | Holland |

By means of watching videos and consulting the game statistics, it finds out that from the Athens Olympic Games to the Rio Olympic Games Chinese women volleyball team's biggest technical advantage is the combination of height and speed, together with the diverse flexibility: the obvious advantages being the height of ace spikers and the rates of drop shots, which reflects the Chinese players' height; the blockers' drop shots and back balls having the hard power of world class, which reflects Chinese players' speed; the Chinese team's rapid stance change adapting to players' substitution, which reflects Chinese players' flexibility. In the Athens Olympic Games, the Chinese team's first-pass had high arrival rate, second-pass having high passing rate, the Chinese team severing high quality spikes, and there were more outstanding players with good services, which provided the Chinese team with the most powerful guarantee to win the Olympic Games. Although the Chinese team' block, defense and counterattack ability had been far away of the world-class

level (the Chinese team's defense ability being the fifth place since the Athens Olympic Games), and weren't improved until the Rio Olympic Games, but there are obvious differences compared with other 7 teams. It is this flaw that lays a hidden danger for the defeats in the Beijing Olympics and the London Olympics.

Table 2. Block Data of Chinese Women Volleyball Team, the Brazil Team, the American Team and the Cuba in the 2008 Beijing Olympic Games.

| | effective block (frequency) | the rate of effective blocks (%) | faulty services (frequency) | the rate of faulty blocks (%) | block attempts (frequency) | block attempts (frequency) |
|-----------|-----------------------------------|--|-----------------------------------|-------------------------------------|----------------------------------|-------------------------------|
| China | 102 | 23.1% | 62 | 14.1% | 377 | 441 |
| opponents | 112 | 29.2% | 71 | 18.5% | 200 | 383 |

It can be seen from Table 2 that the Chinese teams block attempts and the rate of faulty blocks account for a large proportion, which means there is a massive difference between China and other strong teams concerning the ability to predict blocks and marching movement, so the low rate of effective blocks leads to reducing the opportunity of attacks greatly. The blocking data of Chinese women's volleyball team shows that blocking technique is well played in the winning competition, but blocking technique is poor in the failing competition, which shows that Chinese women volleyball players have poor stability in blocking techniques. But in the London Olympic Games, it was lack of the leading core team member in Chinese women's volleyball team, which made its technical style not prominent, thus led to many times clutch shots faults in the competition. At the same time, there was a massive gap between the pass, spiker and blockers in Chinese women volleyball team and those in other four strong teams. The Chinese women volleyball team only got the fourth place in the London Olympic Games [2].

The Impact of Injured Situations of the Main Players of Chinese Women Volleyball Team on Competition Results in the Four Olympic Games

In the first game in the Athens Olympic Games, due to the Chinese volleyball ace spiker Zhao Ruirui's right leg fracture, she was absent from the rest of the competition, and the ace spiker Yang Hao who replaced her also suffered a severe back injury and was forced to end her professional career early. Wang Yimei, the ace spiker in 2008 Olympic Games, had an outstanding attacking ability, but her weight was too heavy, which seriously affected her movement [3]. The ace spiker Hui Ruoqi in 2012 also suffered injuries, and she was unable to adapt to the training and competition intensity in the period of preparation for London Olympic Games because of her emaciated body, didn't return to the field until September 2009.

From the Chinese women volleyball team's performances in the 2008 and 2012 Olympic Games, it is not difficult to find that the Chinese women volleyball team and even other ball games tend to use outstanding physical qualities to cover the techniques shortage. Although it seems that the team has outstanding physical qualities, actually this kind of covering not only provide little help to the team, also can damage the athlete's sports career. Yang Hao's and Wang Yimei's case proved this point. Therefore, the selection of athletes with outstanding physical qualities too early can easily lead to incomplete development of the athletes' potentiality and even trigger a succession of injuries to the athletes. This band-aid thinking must be put an end to.

Winning and Failing Factors for Chinese Women Volleyball in the Four Olympic Games

It can be seen from the Table 3 that Chinese women volleyball team won the championship reversely twice, and the ways of winning can be roughly classified into two kinds. First, the ace

spiker can motivate the whole team to get scores; second, the ace spiker leads the team to winning the game by getting high scores herself. For the first way, the ace spiker scored by cooperating with the other team members flexibly and by mobilizing the whole team to participate in the competition. For example, in the 2004 Athens Olympics, despite the fact the Chinese ace spiker Yang Hao's height is not so high, but by the means of the flexible attacks and diverse attacking methods which makes her attacking positions changeable to get high rates of smashes and services, the ace spiker led the whole team to win the gold medal by extraordinary performance. Although Chinese ace spiker Wang Yimei has strong offensive lethality, but too many personal errors and the unstable state made her skills fall far short of expectations, which made Chinese women volleyball team lost to Brazil by 0:3 and only got the bronze medal, even if the best mat scorer (Zhang Na) and the best receiver (Zhou Suhong) tried the best to cooperate with Wang in the game. In the 2012 London Olympics, the performance of the ace spiker Hui was unstable. Even though she scored a high of 24 points in the quarter-finals, the Chinese team was still out of the top four. In the 2016 Rio Olympics, Zhu Ting, the ace spiker of the Chinese women volleyball team, was strong enough to be the first player in all the players with a total of 179 points.

Table 3. Chinese Ace Spikers' and the Opponent Spikers' Total Scores (The Opponents of Five Group Matches) in the Four Olympic Games.

| | Athens Olympic Games | | Beijing Olympic Games | | London Olympic Games | | Rio Olympic Games | |
|--|----------------------|--------------|-----------------------|--------------|----------------------|---------------------------------|-------------------|--------------|
| the Chinese ace spiker and the opponent spiker ace | Yang Hao | the opponent | Wang Yimei | the opponent | Hui Ruoqi | the opponent | Zhu Ting | the opponent |
| Spikers' scoring in the finals | 136 | 204 (Russia) | 120 | 106 (Cuba) | 100 | not entering in the semi-finals | 179 | 104 (Serbia) |

It can be seen from the above analyses: the ace spiker's scoring ability is a kind of way to lead the team to victory, for it can stabilize the team with the ace spikers' high scores when the team is lagging behind, and it can defeat the opponents by following up a victory with hot pursuit when the team has the lead in the game. This way needs the ace spiker's strong personal ability, and the Chinese team has been cultivating such outstanding ace spikers since 2008 and now has the world's best ace spiker Zhu Ting, whose strong offensive capability laid a solid foundation for the Chinese team to win the championship in the 2016 Rio Olympics. However, this kind of way also has some disadvantages. Too much depending on the ace spiker's strong offensive ability would lead the game to the extreme, and the team can easily be defeated when the ace spiker doesn't play in her good state. Therefore, the Chinese women volleyball team should focus on improving team members' individual special skills to ensure the team's good competitive state at any time, and on this basis it should combine team members' individual special skills with ace spiker's strong offensive capability, which would be the best model to win the game.

An Analysis of New Trends of the Top Five Women Volleyball Teams in the World

New Trend one: the World's Women Volleyball Training Tending to be Masculine

The gap among the world's women volleyball teams is narrowing, and theoretically any team

could win the championship. The reason is the decline of the strong traditional world volleyball teams and the rise of the new international women volleyball teams.

After the 2010 women volleyball world championships, the European women volleyball teams rising sharply again interpret once more that the holding high, the attacking high, the simple practical offense still have strong competitiveness, which also virtually help the world women volleyball offensive tactics to simplify [4]. At the same time, masculine style of women volleyball is gradually adopted by different countries. Techniques and tactics training methods and concepts of women volleyball are becoming more alike men's, and many men's techniques and tactics are gradually adopted by women's. For example: jump serving, rear attacking, three-dimensional attacking, etc. This is an inevitable phenomenon for the world women volleyball teams developing to a certain stage, but "completeness, height, fastness, changing" are still the mainstream of the contemporary volleyball' techniques and tactics, and women volleyball's are no exception.

New Trend Two: Increasing Proportion of Serving points of the world Women Volleyball

Based on the recent four Olympic Games, the top five women volleyball teams lay emphasis on the ace spikers' acing and the successful rate of the serving a ball. For example, in the 2012 London Olympics, the successful rate and the scoring rate of Chinese women volleyball were significantly lower than those of the top five. However, in the 2016 Olympic Games this problem was greatly improved, which was mainly attributed to the player changing the concept of serving and paying more attention to serving's aggressiveness and stability, and as well as to targeted establishment of the practical training system. Therefore, in the training of serving techniques and tactics, it should establish that "every player should have a variety of ways to serve, and could apply these ways correspondingly in different situations, and should change the way of focusing on the serving aggressiveness and ignoring the serving stability."

Exploring New Models of Chinese Women Volleyball Team's Physical Fitness Training

Based on the world women volleyball teams' history, the era of competing the players' height and strength, the ace spiker's super ability to win the game is gone, for it is not difficult for countries to choose the tall, strong players.

For example, in the 2016 Rio Olympics, the Chinese women volleyball team's heights and body qualities are roughly the same as those of European and the United States teams. The average height of the Chinese women volleyball team is 184 cm, the average height of spiking and blocking being 313 cm, the general attacking capability on the mat having reached the world's most outstanding level.

But in terms of physical fitness, there is still a large gap between Chinese and the United States and European teams, and the gap in fitness is related to the athletes' injuries to some extent. This also reflects from another aspect that the main reason that the Chinese women volleyball team's outstanding ace spikers and other outstanding players have a short sports life is that they have poor physical fitness. So how to do physical fitness training? How to shorten the physical fitness gap between China and the United States and Europe? These are the questions that must be taken into consideration in the Chinese women volleyball team's physical fitness training. If a physical fitness training model can be built to match the techniques and tactics level, it will surely promote the Chinese women volleyball team to a further level.

New Model 1: To Change from the Athlete's Individual Excellence to the Whole Team's Excellence

A changing from training one or two outstanding ace spikers to build a whole outstanding team to make each member outstanding is a new model. A team with one or two outstanding individuals is not really a strong team, but a team with the whole outstanding team members is a real strong team. To make the whole team outstanding, the following points must be met. First, the team's moral quality must be outstanding, and the team should have dedicated spirits. Second, the team's manners must be outstanding and the team should have the cooperative spirits. Third, the players'

physical fitness must be outstanding to fight against the high intensity of competitive consumption. Fourth, the team's techniques and tactics must be outstanding, and the team are good at learning and improving the techniques and tactics. Fifth, the individual member's growth must be good, which can make unceasing progress, and stop resting complacently on one's laurels.

New Model Two: to Understand the Construction and Deconstruction of Volleyball Technical Model by Means of Tradition and Innovation of Volleyball Tactics

In the 2016 Rio Olympics, the Chinese women volleyball team played very well in the first two games, but once the opponents saw through the Chinese team's technical model which means that they have already grasped the Chinese team's weakness and found a corresponding solution. Therefore, the Chinese team must be good at dissecting the strong European and American team plays, and attack the opponents by applying smartly the dissected technique moves getting from the opponents according to the Chinese women volleyball team's traditional skills such as serving, tossing and so on.

For example: under the condition of maturely applying the dissected traditional tactics, the Chinese team should develop some specific tactics targeted against the strong rivals such as Russia, Serbia, Brazil, the United States, which means a technique embedded at a high level of tactical platform, and means to make the other side confused by applying the unconventional plays and then to disrupt rivals' techniques and tactics.

New Model Three: to Construct the Scientificity of Physical Fitness Training according to Athletes' Individual Characteristics, the specific event features and sports events' comprehensiveness

Personal Pertinence: to Study Volleyball Players' Individual Characteristics, Advantages and Disadvantages. Physical fitness training should be carried out differently due to the differences from person to person, and highlight the team's personality, and should carry out the targeted training according to the individual member's characteristics. It should break the concept that the physical fitness training of Chinese volleyball programs is that all athletes often use the same one training plan.

As a team, it is acceptable that the unified arranged training plans should be carried out in training, but players in the field have different tasks, different technical features, and different physical characteristics. It is necessary that the team should make specific individual analysis to the whole team besides the unified arranged physical training plans, and should make targeted physical training plan according to different athletes' characteristics, and should help athletes to overcome their weaknesses and strengthen their advantages.

Combination of Physical Training and Volleyball Project Characteristics. In a volleyball competition, the athlete's many technical actions are completed under high strength confrontation, even under the situation of losing focus. Therefore, it needs the athlete's strong physical control ability, and the athlete's more good overall strength, core control power, and the overall coordination and sensitivity, and needs coaches to arrange specific training to complete that task.

At present, it is lack of this kind of targeted trainings in the Chinese volleyball training. The understanding of the concept that a new training method should be designed according to sports training theory and principles together with the characteristics of a specific project, which is widely applied in the world is not good enough. At the same time, the understanding and importance of the core strength training of volleyball is not good enough. Finally, all leads to a disconnection between physical fitness training and volleyball technique and tactical training.

Strengthening the Comprehensive Physical Fitness Training. In the Chinese women volleyball team's physical fitness training, there is a disconnection between training and competition. The main issue is that the physical fitness in training develops athletes' specific physical quality, and the physical fitness in competition needs athletes to transform a variety of physical qualities continuously in a short time. It is lack of this kind of training method which needs

to combine multiple physical training methods together in accordance with the competition's requirements, which lead to the Chinese volleyball players' being lack of pace flexibility and all-round change in competition, and affecting the corresponding techniques and tactics levels.

Conclusion

To sum up, the important data of Chinese women volleyball team and world strong women volleyball teams (Brazil, Russia, the United States and Cuba) in the recent four years Olympic Games are compared and analyzed. It finds out the new trends of the top five women volleyball teams in the world are showing in two aspects: the world's women volleyball training tending to be masculine; the increasing proportion of the serving points of the world women volleyball. It illustrates that there are three new models in Chinese women volleyball team's physical fitness training: to change from the athlete's individual excellence to the whole sports team's excellence; to understand the construction and deconstruction of volleyball technical model by means of tradition and innovation of volleyball tactics; to construct the scientificness of physical fitness training according to athletes' individual characteristics, the specific event features and sports events' comprehensiveness. At the same time, the key to the further promotion of Chinese women volleyball competition is that the mutual complementary must be made between the new trends of Chinese women volleyball competition and the new models of physical training.

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