

## A Literature Review Study of Chinese Women's Table Tennis in the Last Two Decades

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**Abstract:** The participation of Chinese women in competitive sport has been a difficult and long process, reflecting the difficult journey of women's emancipation in China. In the process of the development of competitive sports in China, women's competitive sports have played an important role. This paper collects case studies of women's participation in competitive sports in China at various stages through the literature method to find out the trajectory of women's participation in competitive sports in China and discover the pattern of their journey. Table tennis, as the 'national ball' rooted in the hearts of the public, has received very few review articles, and there is a lack of research on women's table tennis. This paper take tennis in China during this period, in the hope of providing a theoretical contribution to the sustainable development of women's table tennis in China.

### 1. Introduction

It was only after the founding of New China that women's competitive sport really began to develop in China. Athletics is a component of sport, which is characterised by sporting competition, with the main objective of creating excellent sporting results and winning competitions. In China, table tennis is also known as the "national ball". It has won many international competitions and has achieved excellent results in table tennis.

In view of this, this paper will analyse the published articles on women's table tennis in China to explore the inner rules of women's competitive sports and the meaning behind them, in order to promote the development of women's competitive sports in China with certain practical significance and theoretical value. A total of 440 articles were searched through the official website of Wipu Journals using the keywords "women", "women" and "table tennis". Due to the scarcity of literature before 2000 and the lack of depth of research, this paper compares the published journal literature on women's table tennis in China between 2000 and 2021. Excluding the category of news reports, 173 articles were obtained in the category of kinesiology. Although not all relevant literature can be included, these articles are highly representative in the field. This is a good way to build up and guide future theoretical research on the sport of women's table tennis.

### 2. Characteristics of the Literature Distribution of Research on Women's Table Tennis Programs in China

#### 2.1. Study Time Distribution

In terms of the overall volume of literature, there were about 400 studies on women's table tennis in China between 2000 and July 2021, while a search using the keyword 'table tennis' yielded a total

of 3816 articles, which shows that the number of studies on women's table tennis is slightly weak. The years 2004 and 2008 are the peak years for research in this field, and are associated with the Athens, Beijing and Rio Olympics respectively. The study found a strong correlation between the year of publication and the four competitions. Although women's athletics falls within the discipline of sport, the actual issues are highly cross-cutting as they involve multiple disciplines such as sociology, medicine and physiology. However, there are relatively few impactful studies and the sustainability and depth of research needs to be improved.

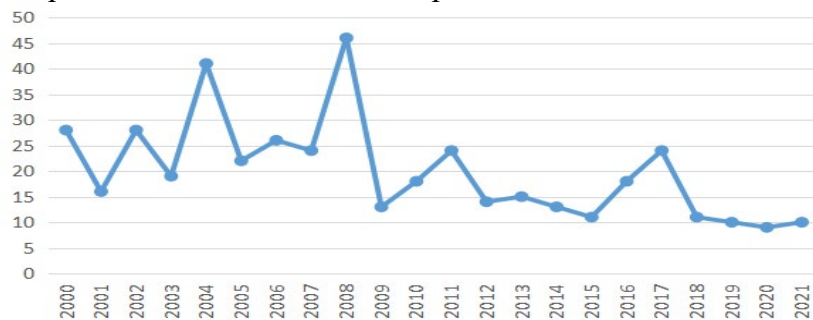


Figure 1. Distribution of women's table tennis research literature, 2000-2010.

## 2.2. Distribution of Source Journals and Institutions

A journal analysis of women's table tennis research can determine the distribution of core journals in the field. As can be seen from Figure 2, 《Table Tennis World》 contains 178 articles, ranking 1st in this field, and is the main platform for research on women's table tennis, while 《New sports》 contains 22 articles, ranking 2nd. 13 articles are published in 《Chinese Sports Coaches》, ranking 3rd. The top ten publishers account for about 35% of the total number of articles. The top ten publishers accounted for about 35% of the total number of articles. The No. 1 ranking was Beijing University of Physical Education and Sport with 15 articles, whose main research topics were athletes, sports, youth, techniques and tactics, etc. The No. 2 ranking was Wuhan Institute of Physical Education with 7 articles, and the No. 3 ranking was East China Normal University with 4 articles. The distribution of journals and subject characteristics can help to understand the latest development of this project.

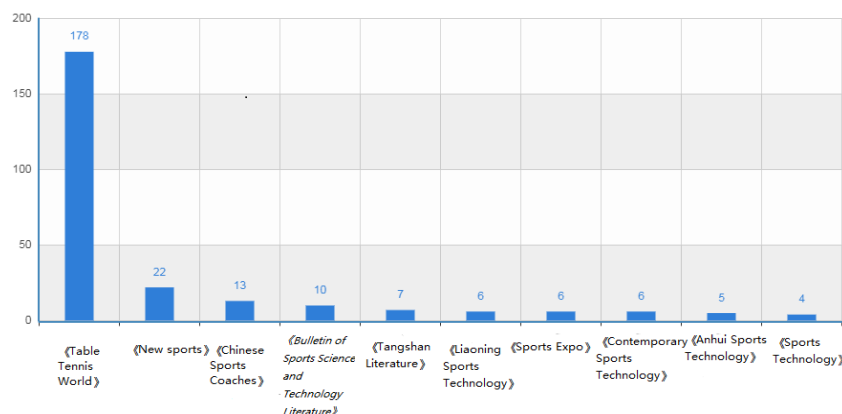


Figure 2. Statistical chart of the main journals publishing articles on women's table tennis, 2000-2010.

## 2.3. Distribution of Authors

In the study of a scientific research activity, the distribution of authors can be used as a weathervane for the field. The top 10 scholars who have published articles on Chinese women's table tennis are: Zhang Yingqiu's team has published 8 articles on Chinese women's table tennis, reserve forces, etc.; Song Fei's team has published 6 articles on table tennis, the World Series, open tournaments, etc.; Li Yong'an has published 5 articles on table tennis, women, outstanding women, etc.; Liang Huimin's The team has published 3 articles on table tennis, athletes, the World Series, the Chinese table tennis

team, coaches, etc.; Jiang Jinjun's team has published 3 articles on the main research groups of table tennis, techniques and tactics, the World Series, universities, etc.; Eve has published 3 articles on table tennis players, careers, etc.; Liu Yaling and Bian Yuxiang have both published 3 articles; .

### **3. Identification of the Reserrch Content of China's Women's Table Tennis Programme**

#### **3.1. Project Development and Theoretical Research**

There is a large amount of literature in the category of theory and research in the study of women's competitive table tennis sports.

Pan Yongzhi and others believe that the masculinisation of women's skills proposed by the Chinese PING Association is far-sighted, and that the focus should be on awareness and playing style during the training of female athletes. Zheng Xiuli discusses the importance of competitive balance in the development of table tennis and the negative effects of an imbalance, suggesting that the FIVB should deepen its reforms and that China should play a strong role in promoting the sport and increasing the participation of countries in table tennis. Cheng Xu points out that in the process of the development of table tennis, there is a need for continuous innovation, which includes innovation in equipment, technical innovation, playing style and training innovation. At the same time, Bai Jie pointed out that one of the reasons why women's table tennis remains a constant success is because of technological innovation, and she also suggested that the masculinisation of women's skills needs to be accompanied by an increase in the influence of psychological factors in the game for female players. Zhu Ling and Li Ying write that the 'overseas ping team' is a sporting phenomenon that has emerged as a result of China's reform and opening-up initiatives and the strengthening of table tennis as a whole. The emergence of "overseas ping ping teams" has added to the strengths of Chinese table tennis as a sport, increasing its voice and influence in the international table tennis arena, but also adding to the difficulties of Chinese table tennis performance. Since the beginning of the 21st century, the International Table Tennis Federation (ITTF) has made changes to the rules of the sport, such as the change from small balls to large balls, the introduction of the 11-point system, and the ban on the use of organic glue. Zhang Mengyuan also argues in the reform of the masculinity of women's technique that this is the key point for a new breakthrough in the playing style of women's table tennis and will certainly become a trend and development of women's table tennis in the world.

#### **3.2. Sports Techniques and Tactics**

There are many factors that influence the level of play and the achievement of excellent sporting results on the field of play, such as: technical level, tactical arrangements, physical fitness, psychology, and motor intelligence. Of these, technique, tactics and psychology are particularly important for table tennis.

There is a large amount of literature in this category. A special study by scholar Zhang Yingqiu on the technical and tactical aspects of table tennis found that effective scoring in a match, as well as avoiding mistakes, is related to the player's technical level, and that the key conditions determining the technical and tactical level are mainly determined by the speed, power, spin, landing point and arc of the ball. Lang Songting took the outstanding Chinese female table tennis player Zhang Changning as the subject of his study and found that in order to improve the skills and tactics of female table tennis players, the drop of the table tennis ball as well as the supporting tactical training etc. should be strengthened in regular training and the importance of the drop of the serve should be emphasised. The power of the forehand attack needs to be brought into play while the serve is used in a supporting manner. Scholar Tang Jianjun discusses the combinations of table tennis tactics in his work *An Outline of Tactical Combination Patterns for the Game of Table Tennis*. He argues that table tennis tactics include the following elements: technique combinations, drop sets and line combinations. By analysing these dimensions, a comprehensive understanding of the use of tactics in table tennis can be obtained, thus quantifying the characteristics of tactical use in table tennis matches.

Tang and Li Chao's research on the perspective of the composition and use of attacking techniques in table tennis points out that in the composition of the table tennis technical system, scoring is mainly

based on attacking skills, supported by control techniques and supplemented by defensive attacks. Hu Mengwei's study on the characteristics of Chinese women's player Zhu Yuling's techniques and tactics of cross-row attack in the game pointed out that, firstly, in the serve-and-snatch section, the application frequency is low, the power of the stroke is lacking, but the scoring rate is good, and it is easy to seize the first opportunity when serving; secondly, in the receive-and-snatch section, the comprehensive performance is not outstanding enough; finally, in the phase of holding, it is smoother, but it lacks stability and the comprehensive effect is not good.

Therefore, the analysis of table tennis techniques and tactics is of great importance to both the game and the training.

### **3.3. A Study of Physical Performance Characteristics**

The physical skills required for table tennis include the ability to react with speed, judgement and decision making after seeing the ball, the ability to move at a fast pace, explosive power at the end of the fingertips when hitting the ball, the swing speed of the arm when hitting the ball and table tennis specific skills. In the human physiology, women are more sensitive than men and good sensitivity is a precondition for achieving faster and more accurate shots. Table tennis is a mixed aerobic and anaerobic sport, with anaerobic metabolism based on strength and speed qualities, with short time and high intensity anaerobic metabolism and other characteristics. It requires a high degree of physical flexibility, and the better explosive upper body strength of female athletes provides good opportunities for attacking during table tennis matches. Pan Yongzhi conducted a 30-day experimental study of a new training model (6 reforms) on 28 athletes from the Chinese women's table tennis second team who participated in closed training before the Beijing Olympic Games. The study proved that the training method of three practices in one day not only brought them in line with European and international competitions, but also met the physiological and psychological requirements of the athletes, helped them adapt to the rhythm of international competitions and helped them enter the game faster. Zhou Qiaoqiao observes, counts, analyses and summarises the physical function training sessions of the Chinese women's table tennis team prior to their preparation for the 52nd World Table Tennis Championships. Rehabilitation training for joints such as the lower back and shoulders as well as further optimisation of preparation activities and end stretching were added, in addition to incorporating core stability strength into the training programme, according to common sports injuries in the sport. The results of the study show that the results of the competition are better to achieve the desired results.

Li Kun explores the correlation between the physical performance and competition performance of China's female junior table tennis players pointing out that age is an important factor affecting physical fitness and that physical fitness corresponds to the physical development pattern of youths, the younger the age, the worse the physical fitness.

### **3.4. Sports Injuries and Conditions**

The rising level of competition in international table tennis is often accompanied by increased loads leading to injuries and affecting the life expectancy of the sport in order to achieve excellent athletic performance. The proposed masculinisation of modern women's technique in table tennis places even greater demands on female athletes.

The analysis of common injuries in table tennis by Shenghua Qi points out that as the upper part of the body is always forward leaning in table tennis, the muscles remain tense and are not stretched and relaxed in time after exercise, leading to local overworking and injury formation, mainly in the shoulders, waist and knees. Zhang Yingqiu investigated the menstrual status of 18 athletes from the Chinese women's table tennis second team and found that menstrual disorders were a common phenomenon among female athletes. The programme is based on a scientific approach to puberty education and a reduction in training load during menstruation. Lu Aifa points out that the characteristics of table tennis include high intensity, high confrontation and high speed, which are closely related to the high injury rate of athletes. Injuries are mostly found in the lower back, shoulder and knee joints, etc. To effectively prevent sports injuries, specific physical training can be targeted, personalised and scientific. The body parts and muscle groups where chronic injuries occur are also

trained for their maintenance.

Zhu Hongwei studied sports injuries in the Xinjiang women's table tennis team. The athletes all had injuries on their bodies and chronic injuries were higher than acute injuries. The injuries were also mainly concentrated in seven areas such as neck, shoulder, wrist, waist, knee, thigh and ankle. The main causes are lack of preparation, heavy training and physical fatigue. Wrist injuries are higher in athletes who play aggressively on both sides of the board than in those who play normally.

### **3.5. Psychological Characteristics**

Table tennis is the national game of China and the women's team is our "dream team". At present, the technical and tactical level of the Chinese women's table tennis team has reached a certain level. In addition to the normal technical and tactical play, the most important factor that can affect the outcome of a match is often the psychological factor, which often leads to abnormal technical and tactical performance and even collapse.

Tu Jianling and Zhou Hao for a more effective implementation of the study on the masculinity of women's skills, also said that in the game female athletes in addition to the emphasis on technical and tactical as well as physical qualities, psychology is also an important influencing factor, including the nervous game psychology, anxiety, etc., and found that the psychological tolerance gap between female athletes and male athletes is larger, and the influence is more obvious in the game. The self-awareness of female athletes is superior to that of male athletes. However, in the competition, the female athletes' psychological control and ability to adapt to the field need to be strengthened, to improve the female athletes' own decisiveness, initiative, competitive spirit, etc.

Wang Wencheng and Ma Pengshuai used different matches as examples to analyse the role of psychological factors in the game. It was found that the serve and the psychological quality of the player indirectly affect the match performance. It is also found that when the score is ahead, when the score is behind, when the serve is critical, when the match point is reached, and when the players are suppressed technically and tactically, it will cause the players' psychological anxiety. Good psychological factors can help athletes to win.

### **3.6. A Study of Match-winning Patterns**

In competitive sport, an athlete's level of play in a particular sport can directly determine his or her own sporting performance. In the case of table tennis, the main factors that determine competitive ability are intelligence, psychological quality, physical fitness, tactics, technology and other factors. The use of tactics can be directly related to the outcome of the game and has a crucial role to play. In the sport of table tennis, when players reach a certain level of skill, the use of tactical combinations will be a crucial decisive factor in winning the game. Every score in the game will involve the use of many combinations of techniques. The use of tactical patterns is directly reflected in the arrangement of the content of the tactical combinations. And the use of tactical combinations is a prerequisite for determining excellent sporting performance in a match. In order to further analyse the winning rules of table tennis, it is possible to summarise the winning factors of each match and find that the scoring is always achieved by a continuous struggle for a few boards, which includes not only the speed, power and landing point of the ball, but also the use of tactics during these boards, including the continuous attacking of the serve, the pulling of the punch, the chipping of the counter-attack, etc., reflecting the unpredictable use of tactics.

### **3.7. Research on Reserve Talent**

The fundamental reason for the longevity of competitive table tennis in China lies in the constant flow of our reserve talent. Nowadays, the original training model cannot fully meet the needs of sustainable development of competitive sports.

Lan Tong suggests that a diversified training model can be developed for the sustainable development of table tennis. He also points out that "development, coordination and sustainability" are the three dimensions of the harmonious development of table tennis. In order to ensure the flow and effective use of funds in competitive sports, enterprises and individuals are encouraged to participate in the investment management of competitive sports. The intelligent training of athletes

can effectively create a talent stream and avoid wasting talent. Zhang Qiuying suggests that the sustainable development of reserve talent can be achieved through the role of cultural education, adhering to the principle of athlete-centeredness, with the content of instruction mainly supported by biology, exercise physiology, exercise anatomy, and specific theories. Cheng Xu pointed out that there are significant characteristics in the geographical distribution, age structure, playing style distribution and sports performance of table tennis reserve talents, and that the reserve talents are closely related to the regional economic level. Lin Lizhen believes that the most important reasons affecting the back-up of the Chinese women's table tennis game come from the instinctive nature of the coaches and the insufficient knowledge of the playing style. Therefore, there is a need to strengthen the theoretical level of coaches and establish a unified ideology to ensure the sustainable development of the women's table tennis reserve force. Jiang Jinjun mentioned that more opportunities should be given to young players to increase their self-confidence and gain experience in the game, in order to ensure the healthy and orderly development of table tennis in China.

#### 4. Conclusion

The Chinese table tennis team is not only the pride of the Chinese people, but has become a sporting cultural label in the world. The women's table tennis team is the result of generations of unremitting efforts by China to achieve its present glory. This paper provides theoretical material for future women's competitive table tennis programs, a methodology for the development of table tennis, and a reference for improving table tennis skills and tactics, from the characteristics of the distribution of literature on women's table tennis programs in China to an overview of the research content of women's table tennis programs.

(1) The number of articles published on women's table tennis shows that women's table tennis is gradually being taken seriously by the sports academic community and is providing a reference for the understanding and appreciation of women's table tennis and for the improvement of techniques and tactics, to some extent promoting the development of the sport.

(2) Most of the literature on women's table tennis focuses on the analysis of techniques and tactics. It is recommended that more attention be paid to women's table tennis from an interdisciplinary perspective, so as to contribute to the development of women's table tennis in China.

(3) To analyse the development of women's competitive sports in China by taking the women's table tennis team as an example, to provide some basic theoretical support for the development of women's competitive sports in China and to promote the sustainable development of competitive sports in China.

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