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Badminton Talent Identification Development (BTID) among Young Badminton Players in Guangxi, China

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Abstract

Badminton occupies a crucial position in China's competitive sports sector. To maintain its leading status on the international competitive stage, it is essential to scientifically identify and cultivate potential young badminton athletes. The core objective of this study is to conduct an in-depth analysis of standardized data on potential youth badminton players in order to identify and develop badminton talent, thereby providing support for the smooth cultivation of sports talents, particularly in the Guangxi region of China and nationwide, to nurture future reserve forces for badminton. Currently, strategies for talent identification primarily focus on the evaluation of physical fitness and psychological traits. In contrast, this study extends to a comprehensive evaluation across four dimensions, including anthropometry, physiology, psychology, and sociology. The main goal and focus of this research are to conduct an integrated assessment of these attributes to provide a theoretical basis and practical guidance for the scientific selection and cultivation of badminton talent.

Keywords: BTID, Badminton, Guangxi, China

Introduction

Badminton is an indoor racquet sport characterized by the use of a long-handled netted racquet and a shuttlecock made of feathers and cork. The playing area is rectangular, with a net in the middle dividing the court into two equal sections. In a match, players use a variety of serving, hitting, and movement techniques to rally the shuttlecock back and forth. The objective is to win by ensuring the shuttlecock does not land within one's own valid area or by forcing the opponent to make a hitting error (Jiang et al., 2019).

Badminton enjoys widespread popularity in China and is regarded as a national sport. According to the "2021 China Badminton Market Analysis Report," the number of badminton enthusiasts in China has surpassed 250 million. This figure not only reflects the broad mass foundation of badminton in China but also highlights its important position in the country's sports culture. In 2014, the market size of the Chinese badminton industry was just

25.7 billion RMB. By 2019, the market size had grown to 34.8 billion RMB, with a compound annual growth rate (CAGR) of 6.25%. As a globally popular sport, badminton has demonstrated its unique charm and value in China, becoming one of the main drivers of growth in the country's sports consumption. Thanks to a strong grassroots foundation and the outstanding achievements of the Chinese national badminton team, badminton is deeply favored by the Chinese people. From urban to rural areas, from schools to communities, badminton courts are widely distributed, making it an important choice for daily recreation and exercise.

This research primarily concentrates on the identification of talent among young badminton players in the Guangxi Zhuang Autonomous Region, China. Utilizing these young athletes as the subjects of investigation, the study examines the approaches to selecting and nurturing elite badminton players in the current context. By employing the young badminton players from the Guangxi Zhuang Autonomous Region as a sample for talent identification, the methodology developed for youth talent identification can be extrapolated to other provinces, municipalities, and autonomous regions across China. Moreover, given China's preeminent position in the global badminton community, the findings of this study have the potential to contribute to the dissemination of effective strategies for identifying young badminton players on a worldwide scale.

Table 1.1
Badminton Three Cup Championships Table by China 1949-2023

Badminton Three Cup Championships Table by China				
Rank	Nation	Thomas Cup	Uber Cup	Sudirman Cup
1	China	10	15	13

Table 1. 2
Olympic Games Badminton Medal Table by China 1992--2024

Olympic Badminton Medal Table by China					
Rank	Nation	Gold	Silver	Bronze	Total
1	China	22	16	16	54

The historical achievements of badminton in China are equally remarkable. Since its first participation in the Thomas Cup in 1982, the Chinese national badminton team has consistently achieved great success on the international stage, becoming the dominant force in world badminton. China has won 22 Olympic gold medals, 10 Thomas Cup titles, 15 Uber Cup titles, 13 Sudirman Cup titles, and numerous World Championship gold medals. These glorious achievements have not only inspired generations of Chinese youth to participate in badminton but also promoted the popularization and advancement of the sport in China. Among these achievements, legendary figures like Lin Dan and Li Xuerui stand out. Their success is attributed not only to personal talent and hard work but also to China's scientific talent identification and athlete development system in badminton. Lin Dan, as a two-time Olympic men's singles champion, exemplifies the precision and efficiency of China's talent identification system for young badminton players. The success of badminton in China is inseparable from the comprehensive evaluation and scientific cultivation of young athletes'

physical attributes, physical fitness, psychological qualities, technical and tactical abilities. It is this systematic and scientific management, from talent identification to development, that has enabled China to maintain its world-leading position in badminton.

As renowned Chinese badminton player Lin Dan once said, "Badminton is not just a sport; it is a symbol of spirit, a spirit of continuously challenging oneself and striving for excellence." This spirit has been passed down and promoted among the youth, providing a continuous source of motivation for the sustained development of badminton in China. The historical achievements of Chinese badminton are magnificent, reflecting not only the strength of Chinese sports but also the success of China's scientific and practical approach to talent identification in youth badminton athletes.

Background of the Study

Since the early 1960s, Russia and other Western countries have initiated sports talent identification programs (Vaeyens et al., 2008). By the late 1960s and early 1970s, many Eastern European countries gradually recognized the limitations of traditional talent selection mechanisms and began to develop selection methods based on scientific theories and empirical support (Bompa, 1999). In this context, Bulgaria became one of the countries pioneering advanced identification methods, achieving significant results. For example, at the 1976 Olympic Games, 80% of Bulgaria's medalists were selected through the country's talent identification program. Athletes from Romania and East Germany also achieved similar outstanding results at the 1972, 1976, and 1980 Olympics (Bompa, 1994).

In China, the athlete selection process involves identifying outstanding individuals from a large pool of children and adolescents who exhibit exceptional innate qualities and potential for future development. Among these factors, innate qualities are considered the core criteria in the selection process (Wang, 1996). When multiple athletes demonstrate exceptional innate qualities and potential for development, the selection process should focus on comparing their inherent advantages. Therefore, athlete selection is essentially a process of deeply assessing the potential abilities of candidates and scientifically predicting their future competitive performance, requiring decision-makers to make informed decisions and precise forecasts (Liu et al., 1998). Clearly, selection must be tailored to the specific characteristics of each sport, utilizing precise testing and evaluation based on the particular indicators for each sport (Wang & Ming, 2002).

When studying the scientific and practical aspects of talent selection for Chinese youth badminton athletes, it is crucial to recognize the profound impact of talent identification on sports performance. Scientific talent selection not only enhances the athletes' competitive level but also ensures their competitiveness on the international stage. For example, according to statistics from the Chinese national badminton team, athletes who demonstrated outstanding physical qualities and psychological stability during their youth are more likely to win world championships in adulthood. This aligns with the views of Li Yongbo, former head coach of the Chinese national badminton team, who emphasized, "Talent selection is the foundation; it is the key step in determining whether an athlete can become a top-level player in the future."

In practice, the scientific approach to talent selection is reflected in the comprehensive evaluation of athletes' physical attributes, physical fitness, psychological qualities, and technical and tactical skills. Physical traits such as height, arm span, and lower limb strength, along with physical fitness indicators like speed, endurance, and flexibility, are important factors in assessing an athlete's potential to become an outstanding badminton player. Psychological qualities are evaluated by examining an athlete's ability to handle pressure and regulate emotions during competition. Technical and tactical skills are assessed through a series of tests and competitions to ensure the accuracy of the selection process. Through these comprehensive evaluations, the coaching team can more accurately predict the athlete's future performance, laying a solid foundation for improved sports results.

Moreover, the scientific approach to talent selection also considers the athlete's growth environment and training system. A supportive growth environment and a scientific training system can provide young athletes with the continuous motivation for development. The Chinese national badminton team pays special attention to athletes' family background, educational environment, and early training conditions during talent selection. These factors can significantly affect an athlete's long-term development and sports performance. Therefore, scientific talent selection not only focuses on the athlete's current conditions but also considers their long-term potential, ensuring the continued improvement of sports results.

When studying the scientific and practical aspects of talent selection for Chinese youth badminton athletes, it is essential to emphasize the far-reaching significance of talent selection for the athlete's personal development. Talent identification is not only about improving sports performance but also plays a decisive role in an athlete's future career and personal growth. Studies show that early scientific talent selection can maximize an athlete's potential. Through scientific testing and evaluation, young athletes with special sporting talents, such as reaction speed, coordination, and flexibility, can be identified—qualities that are key to success in badminton. For instance, Lin Dan, a legendary figure in Chinese badminton, owes much of his success to early scientific talent selection and development. His case demonstrates that correct talent selection can provide athletes with a platform to showcase their skills, leading to extraordinary achievements in personal development.

The significance of talent selection for an athlete's personal development also lies in the cultivation of psychological qualities. As a high-intensity competitive sport, badminton requires athletes to possess strong psychological resilience. Through scientific talent selection, athletes with perseverance and good psychological regulation abilities can be identified, providing them with professional psychological training and counseling to help them remain calm and focused under competition pressure. For example, psychological stability training can help athletes maintain a clear mind during critical moments, allowing them to make the right decisions during a match. This psychological development is not only crucial for the athlete's performance on the court but also positively impacts their personal growth and ability to handle challenges in life.

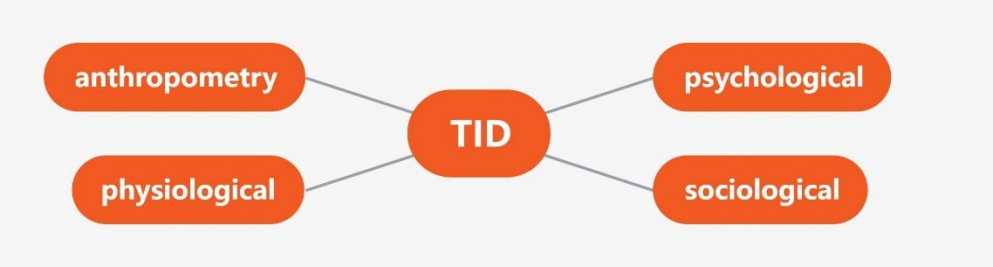

Figure 1 The constituent factors of TID

Scientific talent selection can also provide athletes with a long-term development plan. By evaluating an athlete's physiological characteristics, technical abilities, and psychological qualities, coaches and managers can tailor training programs and development paths to ensure continuous progress on their journey of personal growth. This personalized approach to training not only helps athletes refine their technical skills but also boosts their confidence and motivation at the mental level, enabling them to reach new heights in personal development. As the famous American basketball coach John Wooden once said, "The most important thing is to become the person you want to be." Scientific talent selection is the first step in helping young badminton athletes become the person they aspire to be.To achieve success in badminton, rigorous and systematic training is required, encompassing physical exercise, technical training, mental training, and playing strategies in the field (Ardyanto, 2018).

Guangxi, as one of the five autonomous regions for ethnic minorities in the People's Republic of China, is also an important reserve force for the Chinese national badminton team. Since 1979, the Guangxi badminton team has produced over 20 outstanding athletes who have joined the national team, making it the leading team in Guangxi in terms of talent export to the national squad. Among these athletes, many have achieved significant success, including world champions such as Nong Qunhua, Huang Hua, Qin Yiyuan, Hu Ning, Huang Nanyan, Wu Wenkai, and Zhou Mi; silver medalist Nong Qunhua and bronze medalist Huang Hua at the 25th Olympic Games; bronze medalist Qin Yiyuan and fifth-place finisher Yao Yan at the 26th Olympic Games; silver medalist Huang Nanyan and bronze medalist Qin Yiyuan at the 27th Olympic Games; and international-level athletes such as Nong Qunhua, Huang Hua, Qin Yiyuan, Wu Wenkai, Yu Yong, Huang Nanyan, Hu Ning, Yang Ming, Zhou Mi, and Chen Yu. Focusing on the talent identification of young badminton athletes in Guangxi can provide valuable insights for talent selection in China's badminton sector.

In Guangxi, the development of badminton reserve talents is primarily achieved through three models: the sports system, the education system, and commercially oriented amateur training. First, the sports system model relies on a specialized training system that covers a complete echelon, from grassroots third-tier units (such as youth sports schools), second-tier city-level sports schools, to first-tier youth teams. These athletes receive cultural education at regular primary and secondary schools and either participate in training at sports schools during holidays or choose to attend sports schools for concentrated learning, training, and living. Secondly, the education system model is implemented through traditional badminton project schools, including school-level sports teams at regular primary and secondary schools and high-level sports teams at universities. These athletes must balance academic tasks with competition schedules. Lastly, the commercially oriented amateur

training model involves various badminton clubs and training institutions. With the booming market economy and sports industry, these institutions have gradually grown and played a key role in cultivating reserve badminton talents. Guangxi's badminton clubs and training institutions have made significant contributions to the development of badminton in the region, supplying numerous outstanding reserve talents to high schools, sports schools, and professional teams across Guangxi.

As shown in the diagram, the current training model for youth badminton talents in Guangxi is divided into three main categories, covering talent development through the sports system, the education system, and the social system. Specifically, talent development through the sports system is mainly handled by amateur sports schools, focusing on cultivating badminton reserves; the education system relies primarily on traditional badminton project schools and regular primary and secondary schools, implementing training through school sports; and the social system mainly depends on badminton clubs and training institutions to carry out related work.

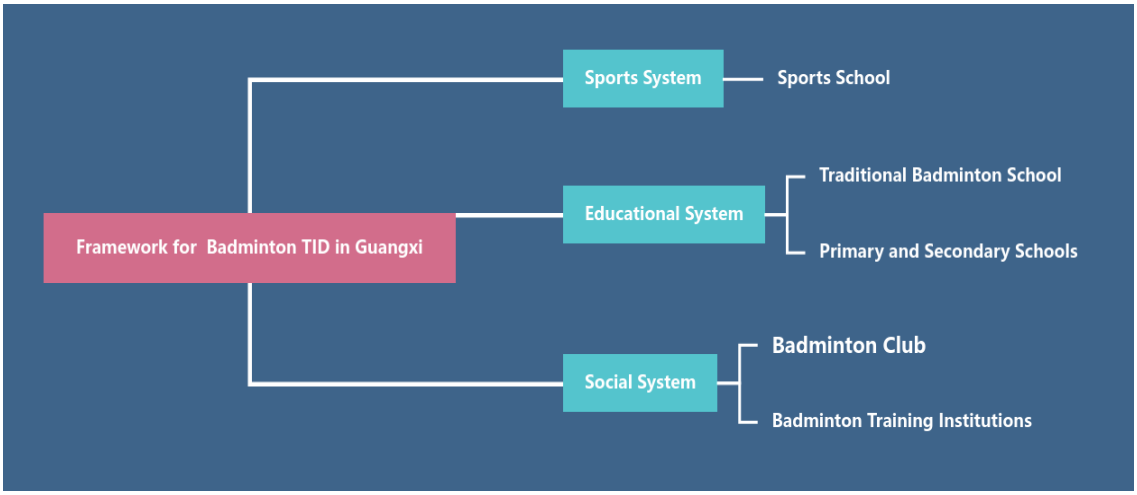

Figure 2 The framework for badminton TID in Guangxi

Problem Statement

When researching the scientific methods and practical operations of talent selection for Chinese youth badminton players, the selection standards for physical morphology are an important factor that cannot be overlooked. Badminton places specific demands on an athlete's physical form, which not only affects their competitive performance but also impacts their long-term career. Ideal height can provide athletes with greater striking distance and better ball control, while a balanced body proportion helps athletes maintain stability during fast movements and turns. Research shows that the typical height range for badminton players is between 170cm and 185cm, which provides advantages in both the front and backcourt during offensive and defensive transitions. Additionally, an athlete’s weight and muscle mass must maintain an appropriate ratio to ensure sufficient power output and endurance. In practice, coaches and talent selection experts use various assessment tools and models, such as Body Mass Index (BMI) and body fat percentage, to comprehensively evaluate whether an athlete's physical morphology meets the selection criteria. Only when an athlete's physical form meets certain standards can a youth badminton player stand out in the highly competitive sports environment.

In the study of scientific methods and practical applications for selecting Chinese youth badminton players, physical fitness standards are particularly important. As a competitive sport, badminton demands high levels of speed, strength, endurance, flexibility, and coordination from athletes. According to relevant studies, outstanding badminton players often exhibit excellent explosive power, rapid movement speed, and lasting endurance. Data from the Badminton World Federation (BWF) indicates that top badminton players can have an average heart rate above 180 beats per minute during matches, reflecting the need for athletes to possess excellent aerobic and anaerobic endurance. During the talent selection process, coaches and sports science experts use a variety of tests, such as a 30-meter sprint, standing long jump, and pull-ups, to assess the physical fitness of youth athletes. At the same time, by considering the athlete's age, gender, and developmental status, statistical models like Pearson's correlation coefficient can be used to more accurately predict their future development potential. Therefore, establishing scientific physical fitness assessment standards is crucial for developing world-class badminton players.

In researching the scientific and practical aspects of talent selection for Chinese youth badminton players, psychological stability is an equally critical factor. As a high-intensity, fast-paced sport, badminton places high demands on an athlete's psychological qualities. Research has shown that psychological stability is one of the key factors influencing an athlete's performance, closely related to their decision-making ability and ability to handle pressure during crucial moments. On the international competitive stage, athletes often need to remain calm during tense matches and make rapid, accurate responses. Athletes lacking psychological stability may make mistakes at critical moments, leading to match losses. Therefore, during the talent selection process, coaches and talent selection experts pay special attention to the psychological qualities of youth athletes, using psychological tests, simulated matches, and other methods to assess their psychological stability. Additionally, psychological training is incorporated into the daily training plan to foster athletes' self-confidence, focus, and stress management strategies.

In competitive sports, psychological quality is equally important as physical fitness and technical ability. For Chinese youth badminton players, psychological training is an essential part of the talent selection and development process. By employing scientific psychological training methods, such as goal setting, self-suggestion, emotional regulation, and concentration training, athletes can more effectively cope with the pressure and challenges in matches. For example, research has shown that regular psychological training can significantly reduce an athlete's anxiety levels during matches, improving their performance. Moreover, psychological training helps athletes develop a positive mindset, boosting their self-confidence and resilience in the face of setbacks. In practice, the Chinese national badminton team has used psychological counseling and team-building activities to effectively enhance athletes' psychological resilience, which has been validated in multiple international competitions. As American psychologist William James once said, "One of the greatest discoveries is that human beings can change their lives by changing their attitudes." Therefore, through psychological training, youth badminton players can not only perform at their best in competitions but also progress further on their personal growth journey.

Over the past 40 years, Chinese badminton has achieved remarkable success in international competitions. During this period, Chinese badminton players have repeatedly

won outstanding results in numerous international events, adding countless medals to the national honor list. This achievement is closely linked to the continuous improvement and development of China's badminton system. In the process of selecting and training young badminton talent, China has implemented a scientific and systematic methodology. This methodology is based on evaluating youth athletes' physiological functions, physical morphology, physical attributes, psychological resilience, and the evaluation of coaches, among other sociological factors, to identify talent. These factors are seen as key indicators for assessing an athlete's potential and growth space.

Badminton, as one of China's gold medal events in the Olympics, not only excels in terms of medal count but also serves as a model for the development of China's sports industry. This study aims to explore in-depth the talent identification mechanisms for badminton athletes, analyze the key factors behind its success, and provide valuable insights for talent selection and development in other Chinese sports programs.

Through an in-depth study of the badminton player selection process, we can better understand how to identify potential athletes at an early stage and provide them with suitable training and development environments. This will not only help improve athletes' competitive performance but also lay a solid foundation for the continued development of China's sports industry. In this way, China's sports community can continue to produce world-class athletes, earning the country more honors and respect.

Research Objectives

The aim of this study is to design and develop a talent recognition system for Chinese adolescent badminton male and female singles players. Through this study,young and new talented teenagers can be easily identified based on their performance of physical, physiological, psychological and sociological assessments. In order to achieve these goals, the following research objectives have been identified.

I. Define the level of anthropometric characteristics and physical fitness among young badminton athletes in Guangxi China

Ii.Define the level of mental toughness among young badminton athletes in Guangxi China

Iii.Define the differences between elite and non-elite young badminton athletes in anthropometry, physical performance and motor coordination in Guangxi China

Conclusion

The talent development system for youth badminton in Guangxi is primarily composed of three major sectors: the education system, the social system, and the sports system. Among these, the sports system, represented by sports schools, plays a key role in training high-level athletes, with athletes from these schools typically exhibiting strong technical abilities and extensive competition experience. The education system and social system provide broad foundational and developmental opportunities for badminton talent.

In terms of age structure, the composition of youth badminton talent in Guangxi is relatively reasonable, meeting the needs of the sport's development patterns. However, there are still several issues related to training years, competitive level, training motivation, and professional demands. The key issue that needs urgent attention is how to enhance athletes' enthusiasm, persistence, and effectiveness in professional training.

The process of developing badminton talent in Guangxi is constrained by multiple factors, including a limited variety of competition types, difficulty in ensuring a sufficient number of competitions, restricted funding sources, insufficient government funding, and low levels of social participation. These factors limit athletes' opportunities to participate in more diverse and higher-level competitions and affect the ability of training institutions to provide better service conditions and support measures.

The development of youth badminton talent in Guangxi is influenced by several factors, with five key ones standing out: objective conditions, coaching factors, athlete factors, competition and training factors, and family environment factors. To achieve sustainable development of badminton talent in Guangxi, relevant government departments should fully leverage their respective functions, providing more support and attention to increase athletes' competition opportunities, optimize the competition system, promote the development of coaching teams, improve coaching standards, and ensure effective training results. At the same time, broadening funding sources, improving training conditions, and ensuring smooth training operations are crucial to the overall development process.

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