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Study on the Influence of Psychological Factors on Badminton Matches of Capital Universities

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Abstract: This study systematically analyzes the influence mechanism of psychological factors on the competition performance of badminton athletes in capital universities through the recent actual participation of university teams in college badminton matches and combined with high-quality literature. The study finds that anxiety, self-efficacy, and factors from audiences and referees are the main influencing variables, and significant gender differences exist. Based on the empirical research results, a psychological intervention program combining mindfulness training, virtual reality technology, and biofeedback training is proposed to provide a scientific basis for psychological training of college badminton athletes.

Keywords: Badminton match; Psychological factors; College athletes; Psychological training

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1. Introduction

With the improvement of the competitive level of badminton events in capital universities, especially among high-level athletes in key matches, the influence of psychological factors on athletes' on-site performance has become increasingly prominent. For example, Xiao Shiyi, a mixed doubles player of our university's badminton team, experienced psychological fluctuations due to errors in the 2024 team competition. After self-regulation and encouragement from teammates, he quickly adjusted his state and finally won the match. Such cases indicate that psychological stability has become one of the key factors determining the outcome of a match. This study aims to reveal the specific influence mechanism of psychological factors on college badminton athletes and provide theoretical support for optimizing training programs.

2. Source and motivation of the research question

College badminton athletes face dual pressures from academics and training, and the stability of their psychological state directly affects their technical performance. Existing studies mostly focus on professional athletes, with fewer studies on college student groups and a lack of attention to the particularity of capital

universities. For example, in the badminton men's doubles final of the 2024 Paris Olympics, controversial referee decisions and audience interference caused psychological fluctuations among athletes, ultimately affecting the match result [1,2]. Therefore, in-depth research on the influence mechanism of psychological factors on college athletes is of great practical significance.

3. Research significance

Demand for improving competitive level: In high-level competitions, the technical gap narrows, and psychological factors become the dividing line between victory and defeat. For example, mindfulness training can significantly reduce athletes' anxiety levels and enhance attention and self-confidence [3,4].

Perfection of college physical education: Psychological training helps cultivate students' stress resistance and promote all-round development [5,6]. Virtual reality (VR) training can enhance athletes' self-efficacy and adaptability by simulating competition scenarios.

Deficiencies in existing research: There are few studies on ordinary college athletes, and long-term follow-up studies on intervention effects are insufficient.

4. Empirical research analysis

4.1. Influence of psychological factors on match performance

Anxiety and stress: Female athletes are more likely to attribute failure to internal stable factors (such as insufficient ability), leading to significantly higher anxiety levels than males. Pre-match over-tension and fear of failure are common psychological problems among college athletes.

Self-efficacy: Athletes with high self-efficacy are more inclined to actively face challenges, and their technical performance is more stable. VR training can enhance athletes' self-efficacy by simulating competition scenarios.

Influence of audiences and referees: The cheering or booing of audiences and controversial referee decisions may all interfere with athletes' psychological states. For example, controversial referee decisions in the men's doubles final of the Paris Olympics directly caused score changes and triggered emotional fluctuations among athletes.

4.2. Research methods and conclusions

Research methods: Mainly using questionnaire surveys (quantifying psychological states with tools such as the Self-Rating Anxiety Scale [SAS] and Perceived Stress Scale), experimental designs (using virtual reality technology to simulate competition scenarios and comparing psychological indicators before and after intervention), and case analysis (tracking athletes' psychological changes and analyzing influencing factors combined with interview methods).

Main conclusions: Psychological training (such as mindfulness meditation and self-talk) can effectively reduce anxiety levels and enhance self-confidence; significant gender differences exist, and female athletes need more targeted intervention in coping with stress and failure attribution; virtual reality technology and biofeedback training can enhance psychological resilience and improve match performance.

4.3. Evaluation of research reliability and validity

The samples are somewhat representative, but some research samples come from professional institutions, so

the applicability to ordinary college athletes needs cautious promotion.

The research design is rigorous enough, and experimental studies mostly use randomized controlled designs, but long-term effect follow-up is less.

The research is based on mature frameworks such as self-determination theory and cognitive-behavioral theory, and the conclusions are convincing.

5. Empirical data support

As shown in **Table 1**, there are significant differences in coping strategies between male and female college athletes. There is no significant difference in the dimension coping strategies to concentrate on solving problems, and there are significant differences in coping strategies to concentrate on dealing with emotions, avoidance, and transcendence.

Table 1. Psychological comparison of college badminton athletes of different genders

Psychological factor	Male athletes (n = 134)	Female athletes (n = 134)	P value
Task goal orientation	34.48 ± 2.15	30.28 ± 2.34	< 0.05
Self-approach goal orientation	28.36 ± 1.89	24.56 ± 2.01	< 0.05
Self-avoidance goal orientation	16.28 ± 1.56	19.87 ± 1.78	< 0.05
Anxiety level	38.52 ± 3.21	42.78 ± 3.56	< 0.01
Positive coping style	4.21 ± 0.65	3.12 ± 0.58	< 0.01

As presented in **Table 2**, the effects of MBSR, task-based intervention, and emotion-based intervention were significantly better than the control group without intervention in reducing the level of anxiety, enhancing self-efficacy, and improving the level of mindfulness. Among them, MBSR was the most effective intervention approach to improve self-efficacy and mindfulness.

Table 2. Influence of different psychological training methods on athletes' psychology

Training method	Sample size	Intervention cycle	Change in anxiety level	Change in self-efficacy	Change in mindfulness level
Mindfulness training (MAIC)	25	7 weeks	-12.3 ± 2.1*	+8.5 ± 1.8*	+10.2 ± 2.3*
Task intervention	21	8 weeks	-9.7 ± 1.9*	+6.3 ± 1.5*	+7.8 ± 1.8*
Emotional intervention	21	8 weeks	-8.2 ± 1.7*	+5.1 ± 1.3*	+6.5 ± 1.6*
Control group	24	-	-2.1 ± 0.8	+1.2 ± 0.5	+1.5 ± 0.7

6. Analysis and practical application

6.1. Match analysis

In **Table 3**, the core growth commonalities of athletes are as follows:

Mental commonalities: Most athletes tend to relax in advantageous situations and fall into passivity in adverse situations, reflecting that "psychological resilience" and "rhythm control" are common shortcomings. Adjusting the state through self-suggestion, partner encouragement, or coach reminders during key points is an important symbol of growth.

Technical growth direction: Service-reception, flat drive, and backcourt smash placement control are high-frequency improvement points, which need to be strengthened through multi-ball training and competitive matches. The tactical awareness has shifted from "fixed shot patterns" to "adjusting according to opponents' weaknesses," reflecting the progression from "execution" to "thinking."

Team collaboration needs upgrading: From "passive cooperation" to "active tactical communication," as mentioned by Athletes 2, 6, and 7, who all need to strengthen information synchronization between partners to avoid "fighting alone."

Table 3. Athletes' psychological changes across different competition matches

Athlete	Match	Psychological changes in match stage	Key psychological turning points
Athlete 1	First match	Tension when leading by 10 points → Realized it was a favorable situation and should attack after teammates' encouragement	Adjusted enthusiasm through self-reminder when affected by opponents' rhythm
	Second match	Disrupted by opponents' shouting → Sober but unable to catch up in the second half	Blamed oneself for errors → Recognized the need for active tactical communication during post-match review
Athlete 2	First match	Doubted oneself after active errors	Realized the need to use advantages to adjust the state after the coach's reminder
	Second match	Preemptively feared due to opponents' strength	Found opponents' backhand weakness but failed to communicate in time
Athlete 3	Whole match	Slow to enter the state at the beginning → Passively adjusted after being pressed by opponents	Reverse the situation after discovering opponents' backhand weakness
Athlete 4	Final	Relaxed when leading → Inattentive due to physical decline	Adjusted through partner encouragement when behind → Re-focused on key points
Athlete 5	First match	Flustered after being caught up → Strengthened offense after the coach's reminder	Mental transition from stable performance to continuous pressure
	Deciding set	Negative when physically exhausted → Took the initiative after seeing teammates' encouragement	Made up for muscle stiffness through shot placement changes and persisted to victory
Athlete 6	Whole match	Inert thinking on site → Led by opponents' rhythm	Mentally unbalanced at 21:23 in key points
Athlete 7	Final	Unstable mentality → Action deformation in key points	Affected power due to upper limb injury

6.2. Practical application

By horizontally comparing each athlete's psychological change stages and turning points, their dynamic development in matches can be intuitively presented, providing a basis for targeted training program adjustments, mainly focusing on:

Psychological training program: Integrate mindfulness meditation and imagery training into daily training, 2 times a week, 30 minutes each time. Pre-match intervention: Use virtual reality to simulate competition scenarios and help athletes adapt to high-pressure environments.

Personalized counseling: Establish mental health files, regularly assess psychological states, and formulate targeted plans. Pay attention to gender differences and provide more emotional support and attribution guidance for female athletes.

College policy support: Optimize physical education courses, incorporate mental health knowledge

into teaching content, and establish psychological mutual assistance communities. Introduce professional psychologists to provide pre-match psychological screening and immediate intervention.

7. Conclusion

This study shows that psychological factors have a significant impact on the match performance of badminton athletes in capital universities, with anxiety, self-efficacy, and audience/referee factors being the main influencing variables. Existing studies have verified the effectiveness of psychological training, but more attention should be paid to the characteristics of ordinary college athletes and long-term intervention effects. Future research can combine virtual reality technology and big data analysis to deeply explore the dynamic change mechanism of psychological factors and provide more precise support for the development of college badminton.

Disclosure statement

The author declares no conflict of interest.

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