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Research on the Interactive Relationship between Pre-competition State Anxiety and Peer Support of College Athletes: A Case Study of Zhaoqing University

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Abstract

This study aims to explore the interactive relationship between pre-competition state anxiety and peer support among college athlete-students, using Zhaoqing University as a case for empirical analysis. A questionnaire survey was conducted among 286 athletes from 12 sports teams at Zhaoqing University, using the Competitive State Anxiety Inventory-2 (CSAI-2) and the Athlete Peer Support Scale. Semi-structured interviews were also conducted to deepen the quantitative results. The findings indicate that: (1) the overall pre-competition state anxiety among athletes at Zhaoqing University is above the medium level, with the highest score in the somatic anxiety dimension; (2) the overall level of peer support is relatively high, especially in terms of emotional and informational support; (3) correlation analysis shows that peer support and its dimensions have a significant negative correlation with cognitive and somatic state anxiety, and a significant positive correlation with state self-confidence; (4) regression analysis confirms that peer support is an effective variable in predicting pre-competition state anxiety, especially in alleviating cognitive anxiety; (5) there are inter-group differences in anxiety and support among athletes of different sports, genders, and sports levels. Conclusion: High-level peer support is a key protective factor in alleviating pre-competition state anxiety and enhancing state self-confidence among college athlete-students. It is recommended that university sports team managers and coaches systematically build and optimize team support systems, incorporating peer support interventions into daily psychological training programs to promote athletes' mental health and competitive performance.

Keywords

College Athlete; Pre-Competition State Anxiety; Peer Support; Psychological Intervention.

1. Introduction

Competitive sports are not only a contest of physical fitness and technical tactics, but also a game of psychological state of athletes. Pre-competitive State Anxiety, as a transient emotional state generated under specific circumstances before a competition, is characterized by tension, anxiety, unease, and arousal of the autonomic nervous system (Martens et al., 1990)[1]. Moderate anxiety can stimulate athletes' potential, but excessive anxiety levels can lead to distracted attention, muscle tension, and deformation of technical movements, thus having a significant negative impact on sports performance (Woodman & Hardy, 2003). As a special group, college athletes shoulder the dual pressure of academics and competition, and their psychological state is more susceptible to internal and external factors. Therefore, in-depth research on their pre-competitive anxiety has important practical significance.

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Among the many socio-psychological factors that affect pre-competition anxiety, social support is considered a core buffering variable. Peer support from teammates is particularly crucial due to its equality, empathy, and accessibility. Teammates are the group with whom athletes have the most frequent contact and similar experiences during training and competition, and they can provide understanding, encouragement, and practical information that other sources of support (such as coaches and family) cannot replace (Freeman & Rees, 2008)[2]. However, current domestic research mostly focuses on coaching leadership styles or family support[3], and there is relatively little discussion on the mechanism of action of athletes' peer support system[4], especially empirical research on college athlete groups is scarce.

Zhaoqing University, as an application-oriented undergraduate institution in Guangdong Province that focuses on sports development, has multiple high-level sports teams and a rich campus sports culture, providing an excellent sample source for research. This study takes college student athletes at Zhaoqing University as the research object, aiming to deeply explore the following issues through a combination of quantitative and qualitative research methods: (1) What is the overall level of pre-competition state anxiety and peer support among college student athletes? (2) What is the correlation between peer support and its different dimensions (emotional, informational, instrumental support) and various components of pre-competition state anxiety (cognitive anxiety, somatic anxiety, self-confidence)? (3) Can peer support effectively predict changes in pre-competition state anxiety? (4) Are there differences among athletes with different demographic variables (such as gender, sports event, sports level)? The results of this study will provide theoretical basis and practical guidance for psychological construction, team atmosphere optimization, and psychological intervention implementation in college sports teams.

2. Research Objects and Methods

2.1. Research Object

The study took athletes from the Zhaoqing University team as the research object. Using random cluster sampling, members of 12 sports teams including basketball, volleyball, football, track and field, swimming, martial arts, and aerobics were selected. A total of 300 questionnaires were distributed, and 286 valid questionnaires were collected, with a valid response rate of 95.3%. The sample composition is as follows: 158 males (55.2%) and 128 females (44.8%); average age 20.4±1.7 years; sports level: 1 international master athlete (0.3%), 25 national first-level athletes (8.7%), 89 national second-level athletes (31.1%), and 171 non-level athletes (59.8%); project type: 172 collective project athletes (60.1%), and 114 individual project athletes (39.9%).

2.2. Research Tools

2.2.1. Competitive State Anxiety Inventory-2 (CSAI-2)

The Chinese version of the scale, developed by Martens et al. and revised by Zhu Beili (1994), was used. The scale consists of 27 items, including three subscales: cognitive state anxiety (9 items), somatic state anxiety (9 items), and state self-confidence (9 items). It uses a Likert 4-point scoring system (1 = "not at all" to 4 = "very strong"). In this study, the Cronbach's α coefficient for the total scale was 0.89, and the α coefficients for each subscale ranged from 0.82 to 0.86, indicating good reliability.

2.2.2. Athlete Peer Support Scale

The scale was developed by Rees and Freeman (2007) and translated and revised by our research team[5]. The scale consists of 12 items, including three dimensions: emotional support (4 items), informational support (4 items), and instrumental support (4 items). It uses a Likert 5-point scoring system (1=“never” to 5=“always”). The higher the total score, the higher the

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perceived level of peer support. In this study, the Cronbach's alpha coefficient for the total scale was 0.91, and the alpha coefficients for each dimension ranged from 0.83 to 0.87.

2.2.3. Interview outline

To gain a deeper understanding of the reasons behind the quantitative data, this study designed a semi-structured interview outline and conducted interviews with 15 typical cases with high and low anxiety and support scores. Questions included: "What are you most worried about before the game?" "How does your teammate usually help you relieve pre-game tension?" "What do you think is the most effective way to support?" and so on.

2.3. Research Procedure

After obtaining the consent of the Sports College of Zhaoqing University and relevant coaches, a trained experimenter conducted a collective test after the training of each team one week before the start of the Guangdong Provincial University Games. The instructions were unified, emphasizing anonymity and confidentiality, and the filling time was about 15-20 minutes.

After data collection, SPSS 26.0 was used for descriptive statistics, independent sample t-test, one-way ANOVA, Pearson correlation analysis, and hierarchical regression analysis. The interview content was recorded, transcribed, and organized using thematic analysis.

3. Results and Analysis

3.1. Descriptive Statistical Results

Descriptive statistics (M±SD) were calculated for the pre-competition state anxiety and peer support of 286 athletes, and the results are presented in Table 1.

Table 1. Descriptive statistics of pre-competition state anxiety and peer support (N=286)

variable	minimum	maximum	Mean (M)	Standard deviation (SD)
Total score of Precompetition state anxiety	**27**	**98**	**65.37**	**12.45**
Cognitive state anxiety	**9**	**33**	**23.12**	**5.68**
somatic state anxiety	**9**	**35**	**24.89**	**5.21**
state confidence	**9**	**36**	**17.36**	**4.92**
Total score of peer support	**12**	**60**	**46.85**	**8.73**
Emotional support	**4**	**20**	**16.82**	**3.15**
Informational support	**4**	**20**	**15.91**	**3.44**
Instrumental support	**4**	**20**	**14.12**	**3.87**

The analysis showed that: (1) The average total score of pre-competition state anxiety was 65.37 (out of 108), which was above the medium level. Among them, the score of somatic state anxiety was the highest (24.89), indicating that athletes had the strongest perception of physiological reactions before the competition, such as accelerated heartbeat and rapid breathing.

Cognitive anxiety was second (23.12), and state self-confidence scored the lowest (17.36), reflecting that athletes generally lacked confidence before the competition. (2) The average total score of peer support was 46.85 (out of 60), which was at a high level. Among them, emotional support scored the highest (16.82), indicating that emotional care and encouragement among teammates were the most common; informational support was second;

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instrumental support scored relatively low, which may be related to the relatively low demand for specific instrumental assistance in the competition situation.

3.2. Analysis of Differences

(1) Gender differences: Independent sample t-test showed that there were significant differences between male and female athletes in somatic anxiety ($t=2.34$, $p<0.05$) and state self-confidence ($t=-3.01$, $p<0.01$). The somatic anxiety of female athletes ($M=25.87$) was significantly higher than that of males ($M=24.12$), while the state self-confidence ($M=16.21$) was significantly lower than that of males ($M=18.28$). No significant gender differences were found in the dimensions of peer support.

(2) Differences in sports: Independent sample t-test showed that athletes in team sports had significantly higher state self-confidence ($M=18.55$) and total peer support ($M=48.92$) than those in individual sports (self-confidence $M=15.61$, total support $M=43.67$) ($p<0.001$).

(3) Differences in athletic levels: One-way analysis of variance (ANOVA) revealed significant differences in cognitive anxiety ($F=4.56$, $p<0.01$) and self-confidence ($F=5.87$, $p<0.01$) among athletes with different athletic levels. Post hoc tests (LSD) indicated that athletes at the national first-level and above had the lowest level of cognitive anxiety and the highest level of state self-confidence, with significant differences compared to athletes without any level ($p<0.05$).

3.3. Correlation Analysis

The Pearson correlation analysis between the dimensions of pre-competition state anxiety and peer support is presented in Table 2.

Table 2. Correlation analysis between pre-competition state anxiety and peer support (r value)

	cognitive state anxiety	somatic state anxiety	state confidence
Total score of peer support	-0.523	-0.461	0.602
emotional support	-0.487	-0.432	0.571
Informational support	-0.501	-0.401	0.554
instrumental support	-0.382	-0.395	0.486

Note: All correlation coefficients are significant at the $p<0.01$ level.

The results showed that the total score of peer support and its three dimensions were significantly negatively correlated with cognitive state anxiety and somatic state anxiety, and significantly positively correlated with state self-confidence. Among them, the positive correlation between peer support and state self-confidence was the strongest ($r=0.602$), followed by the negative correlation with cognitive anxiety ($r=-0.523$). In the dimension of support, informational support had the highest negative correlation with cognitive anxiety, while emotional support had the highest positive correlation with self-confidence[6].

3.4. Regression Analysis

To examine the predictive effect of peer support on pre-competition state anxiety, a hierarchical regression analysis was conducted with cognitive anxiety, somatic anxiety, and self-confidence as dependent variables and the total score of peer support as the predictor variable[7].

After controlling for demographic variables (first level), such as gender, sport, and sports level, the total score of peer support was included in the second level. The results are shown in Table 3.

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Table 3. Hierarchical regression analysis of peer support on pre-competition state anxiety (β value)

dependent variable	Step 1 (Demographic Variables)
cognitive state anxiety	Gender: 0.08; Project: -0.12*; Grade: -0.18**
somatic state anxiety	Gender: 0.15*; Project: -0.07; Level: -0.11
Self-confidence in status	Gender: -0.**16;** Project: 0.21**;** Level: 0.20**

Note: *p < 0.05, **p < 0.01; The table shows the final standard regression coefficient β.

Regression analysis showed that after controlling for demographic variables, peer support had significant additional predictive power for all three components of pre-competition state anxiety. Among them, the predictive power of peer support for state confidence was the strongest (ΔR^2=0.28), followed by its predictive power for cognitive state anxiety (ΔR^2=0.24). This indicates that the higher the level of peer support, the lower the levels of cognitive and somatic anxiety in athletes, while state confidence is higher[8].

3.5. Qualitative Interview Results

Emotional support is a "stabilizer": many high-anxiety athletes mentioned that hearing teammates say "It's okay, go ahead and play, we believe in you" or a high-five hug before the game can greatly alleviate their inner panic (Interviewee B, female basketball player). Information support is a "navigator": high-level athletes (such as national first-class athletes) value more practical information provided by teammates. "Teammates will remind me which player from the other team is used to breaking through from the left, or that my jump today is a little too far back.

This information makes me feel more prepared for the game and less anxious." (Interviewee G, male basketball player) The negative impact of lack of support: one athlete with low support admitted, "The competitive atmosphere in the team is very strong. Everyone looks out for themselves before the game, and I feel particularly isolated. When I'm nervous, there's no one to talk to, so I can only bear it myself. The more I think about it, the more afraid I am of making mistakes." (Interviewee M, track and field athlete) This proves the importance of peer support from the opposite side. The "symbiotic effect" of collective projects: athletes in collective projects generally reflect that team cohesion itself is a powerful support[9]. "We are a whole, and we all prosper or suffer together. This sense of binding makes you feel that you are not fighting alone, and the pressure is shared." (Interviewee K, volleyball player).

4. Discussion

This study comprehensively investigated the relationship between pre-competition state anxiety and peer support among college athlete students at Zhaoqing University. The data results supported the research hypothesis.

Firstly, the study found that somatic anxiety is the most prominent form of anxiety among athletes at Zhaoqing University before competitions. This may be related to the systematic training and relatively less competition experience of college athletes compared to professional athletes.

They are more sensitive to arousal of the autonomic nervous system and lack effective coping strategies. The higher anxiety and lower self-confidence among female athletes are also consistent with previous research, which may be related to women's tendency to internalize stress and sociocultural expectations.

Secondly, this study strongly confirms that peer support is a key protective factor in alleviating pre-competition state anxiety and enhancing self-confidence. The high correlation and regression coefficients indicate that peer support can explain a significant portion of the

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variation in anxiety and self-confidence. This is consistent with the findings of Freeman and Rees (2009).

The underlying mechanism may be as follows: first, emotional support satisfies athletes' need for belonging by providing empathy and recognition, directly buffering the emotional impact of stress (buffer model). Second, informational support enhances athletes' sense of control over the environment and self-efficacy by providing valuable tactical advice and feedback, thereby directly reducing cognitive anxiety caused by uncertainty (cognitive appraisal model)[10]. The metaphor of "navigator" in the interview vividly reflects this point.

Thirdly, athletes in collective sports enjoy higher levels of peer support and self-confidence, highlighting the inherent advantages of social support networks in team sports. Team identity and shared goals bind individuals closely together, making the generation of supportive behavior more natural and frequent.

Finally, the higher the level of sports, the lower the anxiety and the higher the self-confidence, which is in line with the law of skill mastery. High-level athletes, with their successful experience and solid skills, have a more stable belief in their own abilities, and their cognitive evaluation is more inclined to challenge rather than threaten.

5. Conclusion and Suggestions

5.1. Conclusion

College athlete students at Zhaoqing University exhibit moderate to high levels of anxiety before competitions, primarily manifesting as somatic symptoms, and their state self-confidence needs improvement. The overall level of peer support perceived by athletes is relatively high, with emotional support being the most common. Peer support is significantly negatively correlated with cognitive anxiety and somatic anxiety, and significantly positively correlated with state self-confidence, and it has a significant predictive effect on them, with the strongest predictive power for cognitive anxiety and self-confidence. Female athletes, individual event athletes, and low-level athletes are the key focus groups for psychological intervention before competitions.

5.2. Recommendations

1) The system construction team supports a culture of teamwork. Coaches and managers should consciously incorporate team-building activities (such as outdoor training and group psychological counseling) into training to create an open, trusting, and mutually supportive team atmosphere, especially in individual projects, where a sense of belonging to a "virtual team" should be created.

2) Implement peer support training. Peer support skills can be integrated into athlete training programs. For example, athletes can be taught how to recognize signs of anxiety in teammates, how to provide specific and positive feedback (informational support), and how to effectively express encouragement (emotional support).

3) Implement targeted psychological intervention. For high-score anxiety groups (such as female athletes), psychological skills training focusing on emotional regulation and relaxation training (such as mindfulness and breathing regulation) should be carried out to cope with prominent physical anxiety. At the same time, their self-confidence should be enhanced through imagery training, successful recall, and other methods.

4) Establish a ternary support network of "athletes-peers-coaches". Peer support should be regarded as an organic component of the existing psychological support system, complementing the guidance of coaches and the professional intervention of psychological counselors to build a comprehensive and multi-level psychological support network.

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5.3. Research Limitations and Prospects

This study has some limitations. Firstly, the cross-sectional design cannot determine the causal relationship between variables, and future research can be conducted using longitudinal tracking or experimental intervention to further verify. Secondly, the sample is only from one university, and future research can expand the sampling range for multi-center research. In addition, future research can introduce other variables (such as coach leadership style, personality traits) to further explore the complex mechanisms that affect anxiety.

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