Contemporary Education Frontiers, 2026, Volume 4, Issue 7
https://bbwpublisher.com/journal/CEF
Online ISSN: 3029-1860
Print ISSN: 3029-1879

A Practical Study on Pre-competition Psychological Regulation and Intervention Strategies for Winter-sport Athletes

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Abstract: Training and competitions of winter-sport events are susceptible to various external factors, including low-temperature environments, random track variations, and dynamic adjustment of sports equipment. The characteristics of pre-competition psychological fluctuations among athletes differ significantly from those of conventional indoor competitive sports. Accordingly, this study identifies the poor adaptability of existing psychological intervention methods in practical on-site application. Combined with embodied cognition theory and portable biofeedback technology, operable intervention approaches tailored to real competition scenarios and divided by time phases are summarized. It aims to flexibly adjust core intervention priorities according to psychological changes at different pre-competition stages and optimize the implementation path for integrating psychological services into the whole process of training and preparation.

Keywords: Winter-sport events; Pre-competition psychology; Psychological regulation; On-site intervention

Online publication: July 26, 2026

1. Introduction

At present, most domestic studies related to sports psychology mainly focus on psychological scale evaluation in laboratory settings, and the corresponding intervention programs are mostly designed for indoor training scenarios. Direct application of these methods to outdoor winter-sport competitions often results in poor adaptability, high implementation difficulty and unsatisfactory effects. Athletes in winter sports are required to wear heavy professional protective gear, which significantly restricts physical movement, making many traditional relaxation training and psychological adjustment methods difficult to fully implement. With the continuous expansion of the reserve talent pool for winter sports in China, the practical demand for in-team psychological services has been steadily rising. The industry needs to move beyond the general template of competitive psychological intervention, integrate the unique environmental characteristics of

winter-sport venues, and explore psychological regulation techniques that can be rapidly applied in the short windows before competitions—such as in pre-competition venues, waiting areas, and immediately prior to the start.

2. Differentiated characteristics of pre-competition psychological stress in winter-sport athletes

2.1. Disciplinary differences and diversified sources of stress

Firstly, for speed-related events, athletes often experience a narrowing of attention before the competition, focusing excessively on the final timing results and thereby neglecting potential sudden obstacles on the track. The single attempt to participate in such events is limited, and even minor mistakes during training and competition can significantly affect the final ranking results. The "single-result-determining" competitive pressure will significantly increase the cognitive anxiety level and physical tension of athletes before the competition. Research on the pre-competition psychological state of top alpine skiers has revealed that the subjective emotional state of athletes is closely related to their performance on the field. When the anxiety level is low or moderate, the accuracy of their movements is higher, and their competitive state is more stable. However, excessive anxiety can directly weaken their ability to control the details of technical movements.

Secondly, for skills-based events, athletes repeatedly rehearse the entire set of technical movements in their minds before the competition. Repeated visual simulations can lead to the generation of negative movement imaginations, further exacerbating the physical tension. For athletes in the freestyle skiing aerials event, after entering the pre-competition starting area, they often repeatedly recall the technical mistakes from the previous competition. This negative replay of the scene can solidify incorrect movement memories, causing deformation problems during the actual take-off and aerial movements. Such pre-competition psychological problems are also common among ski jumping athletes. Pre-competition psychological barriers mainly manifest as increased competitive anxiety, increased cognitive anxiety, and decreased confidence in competition. Multiple studies have demonstrated that systematic psychological training can effectively improve various pre-competition negative psychological indicators of athletes.

2.2. The physiological-psychological superimposed effect in a low-temperature environment

The pre-race psychological stress of athletes in ice and snow sports has a unique formation mechanism. The outdoor low-temperature environment directly raises the physiological arousal level of the human body. When athletes wait for the competition in a low-temperature outdoor venue, their heart rate naturally increases, and the tension of their muscles continues to rise. These physiological instinctive reactions will overlap with the pre-race psychological anxiety, further amplifying the subjective tension and pressure felt by the athletes.

The waiting areas for competitions on the field are generally small in space. The scene where multiple competitors wait together will form a significant competitive contrast effect, which can quickly intensify the emotional fluctuations of the athletes within half an hour before the competition. After the athletes wear a full set of heavy protective gear, their limb movements are greatly restricted, and they cannot relieve their tension through large-scale limb stretching movements. This also significantly reduces the implementation space for

traditional psychological relaxation training.

The conventional professional psychological assessment tools are not suitable for emergency assessment scenarios in the field. The filling process of the scale questionnaire takes a long time, and the athletes' energy before the competition is highly concentrated on event preparation, making it difficult for them to complete the multi-dimensional and systematic data collection of the scale. The psychological assessment on the field can be appropriately simplified. Staff can quickly determine the psychological stress level of the athletes by observing their facial micro-expressions, breathing rhythm, and tense state of the limbs, combined with a simple subjective feeling scoring method. This simple on-site assessment mode is only used during the short pre-competition window period and is used to quickly screen out athletes who need to receive key psychological intervention [1].

3. Practical strategies for pre-competition psychological regulation intervention for ice and snow sports athletes

3.1. Simplify sensory anchoring and adapt to the competition venue environment

The waiting area for competitions in the ice and snow venue is generally noisy. Continuous equipment operation noise, the broadcast prompts from the venue, and the activities of nearby competitors all continuously distract the athletes' pre-competition concentration. The traditional meditation training in 2009 requires a quiet environment and sufficient practice time, but it is difficult to implement in the waiting area of the ice and snow venue. Therefore, this study suggests that simple sensory anchoring exercises that can be completed in 1 to 2 minutes can be carried out to guide the athletes to focus their perception on the stable sensation of their body at a fixed position, such as the squeezing sensation of the ice shoes on the ankle or the icy cold experience of inhaling cold air through the nose. The practice does not require forcing the clearing of distractions; it only needs to re-concentrate the scattered attention to a single sensory experience.

Such sensory anchoring exercises do not have special requirements for the venue and equipment, and athletes can complete them independently while standing or sitting, waiting for the competition. Research related to the International Ski Federation's Alpine Skiing World Cup shows that most top ice and snow athletes will build an exclusive pre-competition psychological skills system, mainly consisting of two types of methods: physical regulation and cognitive regulation. Before each competition, they will select the appropriate method based on their own self-evaluation of emotions and repeatedly practice. Therefore, such exercises do not need to be set at a fixed frequency. They are completely based on the athlete's subjective feeling of comfort and place no additional psychological burden on the athlete, avoiding excessive practice that may trigger new nervousness.

In specific psychological service work, staff can conduct rapid state observation as soon as the athletes enter the waiting area, focusing on judging whether the athlete's breathing rate is stable, whether the shoulder muscles are stiff and tense, and whether they frequently pay attention to the timing screen. This can determine whether the athlete needs sensory anchoring intervention. If intervention is needed, the staff's guidance language should be within 10 sentences, such as "Feel the pressure and temperature at the position where the ankle and ice shoes are in contact." Brief and straightforward guidance can avoid the athlete developing a resistant mentality towards the waste of preparation time [2].

3.2. Dynamic image adjustment, reconstruction of action imagination

Most traditional imagery training requires athletes to replicate the entire set of specialized technical movements fully. Under high anxiety before the competition, repeatedly replaying past error segments can instead solidify negative movement memories and increase the psychological burden before the competition. Imagery training can help athletes deepen their familiarity with standard movement procedures through repeated rehearsals in their minds of standard technical movements and on-field tactics and strategies. However, the implementation scenarios of such training need to be flexibly adjusted. Repeatedly practicing the entire set of movements is not suitable for the short window period before the competition [3].

The specific adjustment method is to reduce the content of imagery practice, abandon the repeated rehearsal of the entire set of movements, and focus the practice on the stable and controllable local technical aspects of the movements. Before the 500-meter competition at the Salt Lake City Winter Olympics, Yang Yang compiled and wrote down 9 key technical reminders, covering details such as arm swinging, ice pushing, and breathing. The core idea was to focus on "winning the next round of the competition". This way of anchoring attention on controllable movement details is a typical application of precise imagery training before the competition, without predicting the competition outcome, only focusing on polishing the controllable movement sequence.

In the scenarios of the imagery practice, elements of the actual competition environment can be appropriately integrated, such as simulating the physical sensations brought by wind, snow, and low temperatures, to help athletes adapt to the competition environment in advance and reduce their on-site stress responses. The duration of each imagery practice session should be shortened and strictly controlled to 3 minutes. After the practice, no excessive review or in-depth interpretation should be conducted to avoid repeatedly thinking about pre-race worries. For young athletes participating in large-scale events for the first time, they can combine pre-race simulation training to adapt to the competition environment and atmosphere in advance, and reduce the environmental adaptation pressure during the competition [3].

3.3. Portable biofeedback, for real-time adjustment of arousal level

Before competing in ice and snow sports events, athletes need to wear a large number of professional protective gear, which significantly limits their tactile perception of the body surface. Relying solely on subjective feelings to judge their psychological state can lead to certain deviations. Utilizing objective physiological indicators can help athletes more accurately assess their own conditions. Small wearable heart rate collection devices can assist athletes during the pre-training stage in familiarizing themselves with their optimal heart rate range and clearly distinguishing between normal competitive arousal and abnormal heart rate increases caused by excessive anxiety.

During the waiting period before the competition, athletes can simply view real-time heart rate data to distinguish the causes of physiological tension objectively and avoid attributing all elevated heart rates to pre-competition anxiety. Such devices serve only as reference tools for self-state perception. The intervention personnel do not rely on the device data to evaluate the athletes' individual abilities; instead, they assist the athletes in autonomously adjusting their breathing rhythm and calming their overly heightened state of physical and mental arousal.

The core point of practical operation is to complete the "state anchoring" task in advance during the daily training stage. The staff can separately record the heart rate data of the athletes in three scenarios: calm

state, low-intensity warm-up, and high-intensity training. They can then establish a personalized heart rate reference system, enabling the athletes to quickly determine the degree and direction of their state deviation when they see abnormal heart rate values before the competition. During on-site intervention, the staff can use straightforward and gentle expressions, such as "Your heart rate is about 20 beats higher than your usual calm state. Try to lengthen your exhalation and see if you can lower it," to avoid negative psychological suggestions like "You are too nervous [4]."

3.4. Athletes' verbal communication, stable cognitive judgment

Pre-event psychological communication does not require lengthy and in-depth psychological counseling. The overall conversation should be kept brief and efficient. After the Beijing Winter Olympics, Zhang Zhongqiu proposed in the event summary that the formulation of the pre-event training plan can enable athletes to have a clear sense of "what to expect", and the refinement of the pre-event plan can also allow coaches and athletes to communicate their preparation ideas and unify the preparation rhythm fully. However, in the critical window period before the competition, the communication content needs to avoid discussions related to the competition results and reduce statements with a goal-oriented nature such as "must win the championship". It is necessary to guide athletes to shift their attention to the current controllable technical action details[5].

When athletes have catastrophic thinking or make mistakes in overestimating the consequences, staff can use brief questions to help athletes clearly distinguish between controllable factors on the field and uncontrollable variables. For example, in the psychological training system of the ice training center in Heilongjiang Province, the "task orientation" regulation method, which focuses on improving movements and weakening the pursuit of rankings, is an effective way to alleviate pre-event competition anxiety. Pre-event communication should be arranged during the waiting time for the competition, and communication should be reduced near the departure stage to reserve space for athletes to adjust their psychological state independently.

In Qin Huaixue's "10 Key Points for Psychological Adjustment in Competitions", the three items of "focusing on controllable factors", "positive self-talk", and "living in the present" are the core focuses of the short-term verbal intervention before the competition. During the actual operation, the staff can adopt a structured questioning framework. When athletes show uncertainty in their mindset, tension, or confusion, they can be asked in sequence: "What can you control at the moment?" "What is the key to this movement?" "What are you going to do next?" The duration of each conversation should be controlled within 1-2 minutes to avoid it turning into a deep psychological counseling session.

3.5. Establish pre-event micro rituals to solidify stable behavioral habits

The theory of long-term training for winter sports athletes divides the psychological adjustment work of these athletes into four stages: preparation period, transition period, competition period, and recovery period. The focus of psychological intervention varies in each stage. The application of pre-event micro rituals mainly serves to provide psychological transition support from the preparation period to the competition period. These micro rituals cannot directly enhance the athletes' specific competitive abilities, but they can establish clear psychological transition boundaries through fixed behavioral actions, distinguishing the psychological states of waiting for preparation and entering the competition arena.

The practical logic of the pre-race micro ritual is to help athletes establish an exclusive, brief pre-race behavioral process. The action design is simple and easy to understand, and it is suitable for the physical condition of wearing protective gear. It can be a fixed sequence of slight body movements or a fixed frequency of breathing regulation actions. The entire process only takes several seconds to complete. The design logic of the pre-race micro ritual is basically the same as that of simulation training for building the ability to adapt to the venue and appearance training for familiarizing with the action procedures. Both aim to transform the uncontrollable psychological state before the race into controllable and replicable fixed behavioral procedures.

In the consensus on mountain skiing training preparation of the International Ski Federation, it is clearly stated that warm-up and relaxation activities need to incorporate the psychological preparation dimension. They should specifically manage the athlete's attention, concentration, arousal level, self-efficacy, and anxiety. Standardized fixed procedures can effectively improve the compliance and state stability of athletes during training and preparation. Before the 500-meter race at the Salt Lake City Winter Olympics, Yang Yang voluntarily broke the psychological reliance that he had relied on for a long time - the "lucky vest". He transformed the psychological support from external factors into controllable behavioral actions. This adjustment method essentially involves reconstructing a completely new pre-race behavioral procedure to completely get rid of the negative psychological anchoring influence caused by past failure experiences.

The specific content of the pre-race rituals is determined by the athletes themselves. The psychological service personnel only provide reference suggestions and do not force a uniform ritual process for the entire team. They fully respect the individual differences in the habits of the athletes. During the actual service process, the staff can offer limited options for the athletes, such as "Do you want to use a set of fixed movements or a few fixed words to establish your pre-race state?" However, the specific details are entirely left to the athletes to decide on. If the athletes design their own exclusive ritual actions, the staff can assist in simplifying the process and adjusting the rhythm, but will not lead in the content design.

4. Summary

The competition environment of winter sports events is unique, featuring low temperatures, variability, and high uncertainty. These characteristics make it impossible to directly apply the intervention models used in conventional competitive sports to the pre-competition psychological regulation work. Lightweight, scenario-appropriate, and short-duration on-site intervention methods are more suitable for fragmented pre-competition time windows such as during preparation and before the start. Research on top-level alpine skiers has confirmed that athletes only select a few suitable self-regulation methods based on their own emotional states before the competition. This also indicates that "precision intervention with fewer and more targeted methods" is far more in line with the actual preparation needs of winter sports athletes than "complex and extensive" procedures.

Disclosure statement

The author declares no conflict of interest.

References

[1] Li X, 2025, Research on Rehabilitation Techniques and Training Methods in Ice and Snow Sports. Journal of Jiamusi Vocational College, 41(07): 64–66.

[2] Han WY, 2026, The Mechanism of High Altitude and Low Temperature on Human Physiological Functions and Its Implications for Physical Fitness Training of Ice and Snow Athletes. In: Proceedings of the 3rd China Ice and Snow Physical Fitness Forum, pp. 534–541. Beijing Sport University, Institute of Competitive Sports; Chinese Sports Science Association.

[3] Zheng X, 2023, Research on the Relationship Between Behavioral Psychological State of Ski Jumpers and Athletic Performance, thesis, Hubei University.

[4] Jiang ZR, 2024, Performance Characteristics of Snow Skills Athletes and the Application of Psychological Training Management, thesis, Shanghai University of Sport.

[5] Gai WX, Mei JY, 2024, Research on the Impact of Sports Training on Athletes' Social Adaptability. Shandong Sports Science, 46(02): 41–46.

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