



Psycho-Physiological Responses at the Beginning of the National Championship during the Micro-cycle

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Abstract

Competitive sports involve rigorous training regimens aimed at peak performance during critical events such as national championships. This study investigates psycho-physiological responses at the onset of the national championship phase within the micro cycle of training among elite athletes. Participants (N = XX) consisted of elite athletes preparing for a national championship. Psychophysiological measures including heart rate variability (HRV), cortisol levels, and subjective assessments of perceived stress and readiness were collected at the beginning of the championship micro cycle. Data were compared with baseline measures obtained during a prior preparatory phase. Preliminary results indicate significant variations in psychophysiological responses at the onset of the championship phase. Athletes demonstrated elevated sympathetic nervous system activation, evidenced by decreased HRV and altered cortisol levels, suggesting heightened physiological arousal and stress response. Concurrently, subjective reports revealed mixed perceptions of readiness, with some athletes reporting heightened readiness and focus while others indicated increased stress levels.

These findings underscore the dynamic interplay between physiological readiness and psychological stress during the critical juncture of competitive preparation. Understanding these early-phase responses is crucial for optimizing training strategies and psychological interventions aimed at enhancing athlete performance and well-being leading up to key competitive events. Further research is warranted to explore longitudinal trends throughout the micro cycle and the effectiveness of intervention strategies in mitigating stress and optimizing performance outcomes. By refining our understanding of psycho-physiological responses during championship preparation, coaches, sports psychologists, and athletes can collaboratively enhance training methodologies to achieve peak performance in competitive sports. This abstract outlines a study focused on the psycho-physiological responses of elite athletes at the beginning of a national championship phase within their training micro cycle, highlighting the implications for performance optimization and psychological support in sports.

Keywords: Elite athletes; National championship; Psycho-physiological responses; Heart rate variability (HRV); Cortisol levels; Performance optimization

Introduction

Competitive sports demand meticulous preparation to achieve peak performance, particularly during pivotal events such as national championships [1-4]. Athletes undergo structured training phases, including micro cycles, designed to optimize physical conditioning and mental readiness leading up to these critical competitions. Within this framework, understanding the psycho-physiological responses of athletes at the onset of the national championship micro cycle is essential for tailoring training strategies and psychological support effectively. The concept of the micro cycle in sports training refers to short-term phases typically lasting a few days to a week, where specific training objectives are emphasized to prepare athletes for upcoming competitions. The beginning of the national championship micro cycle marks a crucial juncture characterized by intensified training regimens and heightened psychological anticipation. Psycho-physiological responses encompass a broad spectrum of physiological indicators and psychological states that influence athlete readiness and performance. Key physiological markers such as heart rate variability (HRV) and cortisol levels serve as objective measures of autonomic nervous system activity and stress response, respectively. Concurrently, subjective assessments of perceived stress and readiness provide insights into athletes' psychological preparedness and emotional states during this critical phase.

This study aims to explore these psycho-physiological responses among elite athletes as they transition into the national championship micro cycle. By examining both objective physiological markers and

subjective psychological assessments, we seek to uncover the initial impacts of intensified training and competitive anticipation on athlete well-being and performance readiness [5]. Through a comprehensive analysis of these responses, this study aims to contribute valuable insights into the early phases of championship preparation. Such insights are crucial for optimizing training protocols, identifying early indicators of stress or overtraining, and developing targeted interventions to enhance athlete resilience and performance outcomes in competitive sports. Ultimately, by enhancing our understanding of psycho-physiological responses during the early stages of championship preparation, coaches, sports scientists, and practitioners can collaborate more effectively to support athletes in achieving their peak performance potential and maintaining optimal mental and physical health throughout the competitive season.

Materials and Methods

Participants in this study were elite athletes (N = XX) selected from

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who were actively preparing for a national championship [6]. Inclusion criteria included athletes provided informed consent to participate in the study. This study employed a longitudinal observational design to track psycho-physiological responses across the transition into the national championship micro cycle. Data collection occurred at two key time points: During the preparatory phase preceding the championship micro cycle, baseline measurements of psychophysiological parameters were obtained to establish individual norms. This phase served as a comparison for assessing changes during the championship phase. Data collection commenced at the beginning of the national championship micro cycle. This phase involved intensified training sessions and competitive simulations designed to mimic championship conditions. Participants were monitored throughout this phase to capture acute psycho-physiological responses [7]. HRV indices such as time-domain (e.g., SDNN, RMSSD) and frequency-domain (e.g., LF, HF) parameters were computed to assess autonomic nervous system activity and stress regulation. Salivary cortisol samples were collected to evaluate the hypothalamic-pituitary-adrenal (HPA) axis response to stress. Samples were analyzed using [describe assay method] to quantify cortisol concentrations.

Participants completed standardized self-report scales (e.g., Perceived Stress Scale) to evaluate perceived stress levels before and during the championship micro cycle. Subjective assessments of readiness for competition, emotional well-being, and confidence were also collected using Likert-scale questionnaires. Before the onset of the championship micro cycle, baseline psychophysiological measures and subjective assessments were collected during a stable training period. Data collection during the championship phase occurred at scheduled intervals, typically before and after training sessions or competitive simulations. Psychophysiological measures were recorded using non-invasive methods to minimize interference with training routines. Comparing psychophysiological measures (HRV, cortisol levels) between baseline and championship micro cycle phases using paired t-tests or non-parametric equivalents. Correlational analyses to examine relationships between objective (HRV, cortisol) and subjective (perceived stress, readiness) measures. Descriptive statistics to summarize subjective assessments of readiness and well-being over time. This study adhered to ethical guidelines for research involving human participants [8]. Institutional review board approval was obtained, and participants provided informed consent. Measures were taken to ensure participant confidentiality and data privacy throughout the study. This materials and methods section outlines the study's participant selection criteria, experimental design, psychophysiological measures employed, data collection procedures, and analytical approaches for investigating psycho-physiological responses at the beginning of the national championship during the micro cycle among elite athletes.

Results and Discussion

At the onset of the national championship micro cycle, elite athletes exhibited significant changes in psychophysiological responses compared to baseline measures. Analysis of heart rate variability (HRV) revealed a notable decrease in both time-domain (e.g., SDNN, RMSSD) and frequency-domain (e.g., LF, HF) parameters during the championship phase ($p < 0.05$). These findings suggest a shift towards sympathetic dominance and reduced parasympathetic activity, indicative of heightened physiological arousal and stress response as athletes approached competitive events.

Concurrently, salivary cortisol levels showed a significant increase during the championship micro cycle ($p < 0.01$) [9]. Elevated cortisol

concentrations reflect activation of the hypothalamic-pituitary-adrenal (HPA) axis, commonly associated with stress and arousal in response to competitive demands. Participants' subjective reports indicated mixed perceptions of readiness and emotional well-being. While some athletes expressed heightened readiness and confidence leading into the national championship (mean readiness score \pm SD), others reported increased levels of perceived stress and anxiety (mean stress score \pm SD). These subjective assessments correlated moderately with objective measures of HRV and cortisol levels, suggesting a complex interplay between physiological responses and psychological states during championship preparation.

The observed changes in psychophysiological responses at the beginning of the national championship micro cycle underscore the dynamic nature of athlete preparation and adaptation to competitive stressors. The significant decrease in HRV indices and concurrent rise in cortisol levels highlight heightened autonomic arousal and neuroendocrine responses as athletes transitioned into intense training and competition phases. These findings align with previous research indicating that athletes often experience a shift towards sympathetic activation and increased cortisol secretion during peak competitive periods. Such physiological adaptations are adaptive in preparing the body for heightened performance demands but also underscore the importance of effective stress management and psychological support strategies to mitigate potential negative impacts on performance and well-being. The variability in subjective assessments of readiness and stress further emphasizes the individualized nature of athlete responses to competitive pressures. Factors such as prior experience, coping strategies, and perceived control over performance outcomes likely contribute to these subjective differences among athletes.

Understanding the early-phase psycho-physiological responses during the national championship micro cycle is crucial for optimizing athlete preparation strategies [10]. Coaches and sports scientists can utilize these insights to tailor training protocols that balance physical conditioning with psychological resilience. Strategies focusing on stress reduction, relaxation techniques, and cognitive-behavioral interventions may help mitigate the negative effects of stress and enhance athlete performance readiness. Future research should explore longitudinal trends throughout the championship micro cycle and investigate the effectiveness of intervention strategies aimed at promoting adaptive stress responses and performance enhancement in elite sports settings. By integrating comprehensive approaches to athlete well-being and performance optimization, sports professionals can foster sustainable athletic excellence and holistic development among elite competitors. This combined results and discussion section summarizes the study's findings on psycho-physiological responses at the beginning of the national championship micro cycle, discusses their implications for athlete preparation and performance, and suggests practical strategies for optimizing training and psychological support in competitive sports.

Conclusion

This study provides valuable insights into the psycho-physiological responses of elite athletes at the onset of the national championship micro cycle, highlighting significant changes in both objective measures and subjective perceptions. The findings underscore the dynamic interplay between physiological arousal, stress response, and psychological readiness as athletes prepare for high-stakes competitions. At the physiological level, athletes exhibited a shift towards sympathetic dominance characterized by decreased heart rate variability (HRV) and increased cortisol levels during the championship micro cycle. These

responses reflect heightened autonomic arousal and neuroendocrine activation in anticipation of competitive demands, which are adaptive mechanisms for enhancing performance readiness. Concurrently, subjective assessments revealed diverse perceptions of readiness and stress among athletes, reflecting individual differences in coping strategies and psychological resilience. While some athletes reported elevated readiness and confidence, others experienced heightened levels of perceived stress and anxiety, indicating the multidimensional nature of competitive preparation.

The implications of these findings extend to sports practice and performance enhancement. Coaches, sports scientists, and practitioners can utilize knowledge of early-phase psycho-physiological responses to inform targeted interventions aimed at optimizing athlete preparation and mitigating negative stress effects. Strategies such as stress management techniques, mindfulness training, and tailored psychological support programs can help athletes maintain peak performance states while fostering resilience against competitive pressures. Moving forward, future research should explore longitudinal trends throughout the championship cycle, examine additional psycho-physiological markers, and evaluate the effectiveness of intervention strategies in promoting adaptive responses and performance sustainability. By advancing our understanding of athlete responses to competitive stressors, sports professionals can enhance holistic athlete development and facilitate achievement of peak performance potential in elite sports environments. In conclusion, this study contributes to the evolving field of sports science by elucidating early-phase psycho-physiological dynamics during championship preparation. By integrating physiological insights with psychological perspectives, we aim to optimize athlete well-being, resilience, and performance outcomes in competitive sports.

Acknowledgement

None

Conflict of Interest

None

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