International Journal of Sport Studies for Health

Journal Homepage

Psychophysiological Responses to Competitive Anxiety, Stress Biomarkers (sCort and sAA), and Performance in Elite Female Basketball Players

Amir Hossien. Mehrsafar[1*], Behrouz. Golmohammadi[1], Parisa. Gazerani[2]

[1] Division of Sport Psychology, Department of Physical Education and Sports Sciences, Faculty of Humanities, Semnan University, Semnan, Iran
[2] Department of Life Sciences and Health, Faculty of Health Sciences, Oslo Met, Oslo, Norway

*** Corresponding author email address**: a.mehrsafar@semnan.ac.ir

Editor	Reviewers
Hadi Nobari Professor, Transilvania University of Brașov, Brasov, Romania. petrojonck@hotmail.com	**Reviewer 1:** Hamed Golmohammadi Department of Physical Education and Sport, Sivas Cumhuriyet University, Sivas, Turkey **Reviewer 2:** Hassan Gharayagh Zandi Department of Behavior and Cognitive Sciences in Sports, Faculty of Sport Sciences and Health, University of Tehran, Tehran, Iran.

1. Round 1

1.1 Reviewer 1

Reviewer:

In the Introduction, the discussion of the catastrophe model is theoretically relevant; however, the manuscript does not operationalize or empirically test the non-linear interaction effects central to catastrophe theory. The sentence "*When cognitive anxiety is high, even small increases in arousal can lead to sudden and significant declines in performance*" implies interaction-based modeling, yet the statistical analyses are exclusively linear and additive. The authors should either justify why catastrophe theory was used primarily as a conceptual framework or include interaction analyses between anxiety and physiological arousal variables to align the analytic strategy with the theoretical model.

The Performance Assessment section states that "*performance metrics were not normalized per playing time, as all athletes played a comparable amount of time during the competition*." However, no descriptive statistics are provided to support this assumption. Even modest differences in playing time may influence turnover frequency, assist ratios, and shooting opportunities. The authors should report actual playing-time distributions or consider adjusting performance variables relative to minutes played to improve interpretability.

The Procedure section mentions that baseline saliva samples were collected one week prior to competition under "*non-competitive, low-stress conditions*," yet the environmental and contextual characteristics of this baseline condition are insufficiently described. For example, it is unclear whether baseline collection occurred after training, on a rest day, or in a laboratory setting. Greater detail regarding contextual equivalence between baseline and competition conditions is necessary to support the interpretation that observed biomarker increases were competition-related rather than context-driven.

Author revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

The Participants section reports that menstrual cycle phase and hormonal status "*were not controlled or recorded*," despite the manuscript later emphasizing sex-related physiological stress differences. This omission constitutes a major methodological limitation because fluctuations in estrogen and progesterone substantially influence cortisol responsivity and autonomic stress activation. The authors should provide a stronger justification for not controlling menstrual cycle phase and discuss in greater depth how this uncontrolled variable may have influenced biomarker variability and attenuated or inflated observed associations.

The paragraph beginning "*A sensitivity power analysis was performed using G*Power*" requires clarification regarding the rationale for selecting an effect size threshold of $f^2 = 0.54$. This represents a very large effect and raises concerns that the study may have been underpowered for detecting moderate but practically meaningful relationships. The manuscript would benefit from a transparent explanation of why this effect size was deemed appropriate and whether the regression models satisfy contemporary recommendations for predictor-to-sample ratios in multivariable analyses.

The Methods section indicates that "*participants were instructed to maintain consistent sleep and dietary routines prior to testing*," yet no objective verification procedures are described. Because sleep quality, hydration status, and nutritional intake can substantially affect salivary cortisol and alpha-amylase, the manuscript should specify whether compliance logs, actigraphy, dietary recalls, or standardized pre-testing instructions were used. If such controls were absent, the limitation should be acknowledged more explicitly.

The manuscript reports that saliva samples were collected "*30 minutes before competition*," whereas the CSAI-2R was administered approximately one hour before competition. Given the rapid temporal dynamics of sAA relative to cortisol, the authors should justify why these measures were not synchronized more closely. It is possible that psychological states shifted substantially between questionnaire completion and saliva collection, thereby reducing temporal alignment between subjective and physiological stress indices. A discussion of this timing issue is warranted.

The description of the physiological assessments is generally strong; however, the manuscript lacks important details regarding assay procedures. For example, the ELISA and kinetic assay procedures do not specify whether duplicate or triplicate analyses were conducted, whether technicians were blinded to athlete performance outcomes, or whether all samples from a participant were analyzed within the same assay batch to minimize inter-assay variability. Including these methodological details would improve reproducibility and methodological rigor.

Author revised the manuscript and uploaded the updated document.

2. Revised

Editor's decision after revisions: Accepted.
Editor in Chief's decision: Accepted.