

## **The effect badminton specific exercise on badminton serve performance in competition and practice climates**

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**Introduction:** In many sports situations, visual, cognitive and motor performance is undertaken in conditions where cognitive anxiety is higher (via competition) and physiological arousal is higher (via exercise intensity) and both act at the same time that performance is required. In basic terms, there is a need for scientists to replicate the demands of performance when examining the effect of any intervention on performance variables. In such situations, the use of competitive situations and simulated competition settings has been shown to impact on cardiovascular reactivity and motor skill performance differently to practice. However, research has not fully examined how competition influences skilled performance in circumstances where there is relevant physiological load as, within many sport and exercise domains, skilled performance is not undertaken in the absence of physiological load. For example, successful performance in racquet sports, such as badminton, requires players to accelerate, decelerate, change direction, move quickly and maintain balance whilst at the same time performers must also repeatedly demonstrate skilled performance via optimum stroke production. In order to enhance understanding in the field this study examined the effects of changes in physiological and psychological arousal on badminton short and long serve performance in competitive and practice climates.

**Method:** Twenty competitive badminton players (10 males, 10 females) volunteered to participate in the study following ethics approval. After familiarisation, Badminton short and long serve performance was measured at rest, mid-way through and at the end of a badminton specific exercise protocol in 2 conditions; competition vs practice. Ratings of cognitive and somatic anxiety were assessed at three time points, prior to badminton short serve performance using the Mental Readiness Form 3 (MRF3). Heart Rate (HR) and Rating of Perceived Exertion (RPE) were assessed during the exercise protocol.

**Results:** Results indicated better short serve performance was evident in practice compared to competition ( $P = 0.034$ ). There was a non-significant trend towards better performance in practice compared to competition for long serve performance ( $P = 0.066$ ). RPE values were significantly higher in the competition

condition compared to practice ( $P = 0.007$ ). Cognitive anxiety intensity was significantly lower post exercise in the practice condition compared to competition ( $P = 0.001$ ). Cognitive anxiety direction showed greater debilitation post exercise in the competition condition compared to practice ( $P = 0.01$ ). Somatic anxiety intensity increased from pre, to mid to post exercise ( $P = 0.001$ ) irrespective of condition.

**Discussion:** This study is novel in that it examines the effects of badminton specific exercise on badminton performance in non-laboratory competition and practice conditions. Collectively, the results indicate that, at the end of the badminton specific exercise bout (i.e., when physiological arousal was at its highest), participants reported the greatest increase in cognitive anxiety, which was shown to be more debilitating to performance, in the competition condition compared to practice. In terms of practical implications, the results of this study suggest that competition conditions produced different responses to practice conditions. Such suggestions align with the catastrophe model, acknowledging that physiological and psychological stimuli act dynamically and interactively to impact badminton performance in situ. **Conclusions:** Badminton serve performance was poorer in simulated competitive conditions, compared to practice when physiological load, elicited via badminton exercise was high. Thus, coaches and scientists would benefit from employing more representative learning designs in their research and practice, by focusing practice sessions on competition, in order to better optimise badminton performance.