

Basic reporting

The aim of this study to investigate difference of kinematic parameters of mid-range and long-range basketball players before and after the onset of fatigue, providing a comprehensive analysis of how fatigue affect shooting performance at these distances. For this purpose, data recorded from 12 collegiate male basketball players.

Experimental design

While the study uses the BEST test and Yo-Yo IR1 protocol to simulate game-like fatigue, the shooting tests are stationary and isolated (i.e., four set jump shots from fixed points). However, real-game shots often involve dynamic movement, defensive pressure, and contextual decision-making. Can the controlled environment truly mirror the complex motor and cognitive demands of live competition?

The authors report decreased wrist angular velocity and increased lower limb angular velocity post-fatigue. This is interpreted as compensation due to impaired upper limb neuromuscular control. However, increased lower limb velocity could reflect a strategic biomechanical adjustment rather than a negative outcome. Could this be an adaptive mechanism that trained athletes use to maintain power transmission under fatigue?

Validity of the findings

The study used 12 elite, right-handed, male, collegiate basketball players from one program. While the internal consistency is strong, this raises questions about external validity. How would these findings hold across:

- Female athletes?
- Younger or older players?
- Recreational or non-elite populations?
- In-game, dynamic shot attempts?
- These questions probe into:
 - Ecological validity of testing procedures
 - Interpretation of biomechanical adaptations
 - Population generalizability

Additional comments

Recent literature does show increasing use of machine learning and artificial intelligence (AI) in the biomechanical analysis of basketball shooting, particularly under fatigue. This current manuscript does not sufficiently engage with these emerging methodologies or cite recent influential works. Here are two examples you could suggest the authors examine to improve their literature review:

1. Karlik & Hawamdah (2024)

Title: Artificial Intelligence Enhanced Kinematic Analysis of Basketball Free Throws

2. Rendon-Galvez et al. (2024)

Title: Anthropometric and Electromyographic Characteristics of the Free Throw Shooting Gesture in University Basketball Players.

The authors of the PeerJ manuscript should consider integrating and referencing these newer approaches to:

- Highlight methodological gaps between traditional biomechanics and AI-enhanced analytics.
- Acknowledge how machine learning can provide predictive insights beyond mean-based statistical comparisons (e.g., T-tests).
- Suggest potential for future expansion of their work using ML-based performance modeling.
- This would not only modernize their literature review but also position their work within the current research frontier.