IRISH STRENGTH & CONDITIONING NETWORK
Research Review

Title

Criterion Validity and Reliability of a New Medicine Ball Rotational Power Test

Source

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Purpose of Study

To assess the validity and reliability of two medicine ball rotational power assessments: the novel push for maximum velocity by radar (MB*vel) and the commonly used push for maximum distance by tape measure (MB*dis), against the criterion reference 3-dimensional motion capture (MoCap).

Key Findings

1. **MB_vel (Velocity Test)**:
   - Demonstrated excellent accuracy (ICC = 0.97) and nearly perfect agreement for bias (-0.09%) and precision (1.49%).
   - Showed excellent reliability overall (ICC = 0.94) for both dominant (ICC = 0.88) and nondominant sides (ICC = 0.93).
2. **MB_dis (Distance Test)**:
   - Showed poor accuracy (ICC = 0.38), large bias (12.43%), and lower precision (4.55%).
   - Demonstrated moderate reliability (ICC = 0.72).
3. **Comparison with MoCap**:
   - MB_vel had a small, consistent overestimation by radar versus MoCap.
   - MB_dis was less effective due to suboptimal throw trajectories and lower resultant velocities.

Practical Applications

- **MB_vel**: Valid and reliable for measuring rotational power performance, enabling practitioners to profile, benchmark, and assess athletes in the field.
- **MB_dis**: Less accurate and reliable, suggesting caution in its use for assessing rotational power.

Research Methods

The study involved 15 professional female cricketers performing 24 maximal throws of a 2-kg medicine ball across two sessions. Data were collected using MoCap, radar, and tape measure, and analyzed for accuracy, reliability, bias, and precision.

Strengths and Limitations

Strengths:

- Comprehensive assessment of both velocity and distance-based tests.

- Highlights the superior accuracy and reliability of the MB_vel test.

Limitations:

- Small sample size.
- Potential measurement differences due to calculation methods between MoCap and radar.

Takeaway Message

The MB*vel assessment is a valid and reliable method for measuring rotational power in elite sport settings, while the MB*dis assessment shows significant limitations. Practitioners should consider using MB_vel for accurate and reliable field-based assessments of rotational power.
