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LETTER TO EDITOR

Biomechanical Divergence: Why Male Coaching Models Fail Female Fast Bowlers

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Letter

The growth of women cricket in Pakistan is gaining momentum; nonetheless, coaching, training, and rehabilitation patterns are still based to a large extent on male based biomechanical models. The clinical implications of such a mismatch have become clinically relevant and have become more common in musculoskeletal practice.

Traditional models of fast bowling are based on the focus on the velocity of the approach, lengthy run-ups and high flexion of the trunk forward. Sex-specific biomechanical studies, however, suggest an alternative leading way of power production in elite female fast bowlers. In elite pace bowlers, Feros et al. found the ball-release velocity to be more correlated with the thoraco-pelvic lateral flexion at the front-foot contact and pelvic orientation at the back-foot contact than with the linear approach velocity.[1] These findings suggest that elite female pace bowlers preferentially generate ball velocity through rotational and angular momentum mechanisms rather than linear approach speed. Increased emphasis on run-up speed or overemphasized forward trunk positioning may jeopardize the lumbo-pelvic stability which is central to the effectual transmission of force.

There are anatomical and neuromuscular differences that on average differ between female and male athletes including morphology of the pelvis, Q-angle fixation and trunk mobility profiles.[2] These differences affect rotational leverage and spinal stabilization measures. Instead of being manifested as technical faults, enhanced pelvic rotation and lateral flexion in women bowlers could be the adaptive strategies to deal with a decrease in linear momentum.[2,3] It has been proposed that motion-analysis studies indicate that female bowlers more often use front-on bowling, and they create power with late-lateral-phase pelvic-trunk rotation.[3] This might increase the rotational potential but lack of neuromuscular control could increase lumbar loading especially when bowling in large volumes.

Mechanisms in the lower limbs can also increase the risk of injury. Bowling patterns that favor rotation and fatigue and lack of control over hip position could be more predisposing to anterior cruciate ligament injury particularly when training surfaces are not even and qualified strength and conditioning support is unavailable.[4] Specifically in cricket, Lyons et al. reported that kinematic demands in female pace bowlers differ markedly from male counterparts, with implications for lower-limb loading and injury susceptibility.[2]

These reflections show that coaching and rehabilitation systems of female fast bowlers may need to differ substantially from those designed for male athletes. Anti-rotation control measures and progressive thoraco-pelvic dissociation training should be followed by rotational power development. Specific neuromuscular training of the hip-pelvis complex, especially gluteus medius and deep pelvic stabilizers should be given first priority. Moreover, the patterns of workload-monitoring models constructed in male athletes might not be the accurate predictors of load patterns and injury risk among females.[5]

With the sustained investment in female Pakistani cricket, it is now time to change biomechanics, coaching, and

rehabilitation practices and align them to new evidence of females. Female fast bowlers may experience different loading patterns and injury risks and the risk of injury, and these distinctions must be clearly implemented into the system of training and medical care.

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***Disclaimer**: I as author want to declare that I used AI-assistant tools in this article for improving language. I am fully responsible for the accuracy, originality, integrity, and scientific validity of this article.*

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