

Biomechanical factors predisposing to knee injuries in junior female basketball players

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Abstract-

This cross-sectional observational study aims to determine isokinetic normality data at different speeds, and isometric data of ankle and knee joints, in healthy basketball players aged 15–16 years old. The participants were recruited through non-probabilistic convenience sampling. Sociodemographic, anthropometric, and biomechanical variables were collected. The study involved 42 participants. Right-leg dominance was higher in women (85.7%) than in men (78.6%). Men had a higher weight, height, and body mass index compared to women. Statistically significant differences were observed between sex and height ($p < 0.001$). Significant differences were found between sexes in knee flexor and extensor strength at different isokinetic speeds (30°/s, 120°/s, and 180°/s), except for the maximum peak strength knee flexion at 180°/s in the right leg. In the ankle, the variables inversion, eversion, and work strength values at different isokinetic speeds and full RoM, by sex, were not significantly different, except for the right ($p = 0.004$) and the left ($p = 0.035$) ankle full RoM. The study found lower knee extensor strength in women, indicating the need to improve knee flexor/extensor strength in women to match that of men, as seen in other joints. The results can guide the development of preventive and therapeutic interventions for lower limb injuries in basketball players.

Index Terms- knee; ACL; isokinetics; biomechanics; basketball

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