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Lower limb dynamics in two approaches of stair descent initiation: Walk and stand

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The purpose of this study was to compare the peak moments and peak power at hip, knee and ankle joints between the walk approaches and stand approach. The walk approach included components of level walking and stair walking whereas the stand approach included only stair walking component. Fourteen young, healthy adults (6 males; 8 females) participated in the study. A three step customized stairway with an additional walkway (~2.4m) was used for the motion trials. For both the approaches, the limb striking the second step was lead limb and the limb striking the topmost step (step 1) was trail limb. Walk approach showed a significantly higher hip abductor moment ($p=0.006$), knee extensor moment ($p=0.049$) and knee eccentric power ($p=0.003$) for the trail limb during controlled lowering phase compared to stand approach. No significant difference was found in any variable for the lead limb between the two approaches. The results imply that the effects of velocity during stair descent initiation from a walk approach diminish on the second step and maximum balance control occurs when transitioning from level walk to stair walk. This study highlights the necessary adjustments made by the healthy young adults to achieve a safe stair descent, which might help reduce the risk of fall in older adults.

Biography

Ketki Rana has completed her Bachelors in Physical Therapy at the age of 23 years from Maharashtra University of Health Sciences, India. She was keen to have a deep understanding of joint biomechanics and to study how external and internal forces affect the skeletal system of the human body. She completed her Master's program in Kinesiology with Biomechanics specialization at the age of 25 years from Texas Woman's University. She gave local paper and posters presentations in her research project. She strongly believes in evidenced based practice and currently working as a Senior Physical Therapist in an orthopedic outpatient clinical setting.

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