

Title: Effects of treadmill training with partial body weight support on patients following total knee arthroplasty.

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Background and purpose: Patients with Total Knee Arthroplasty (TKA) has reported improvement in pain and function after surgery. However, a majority of those patients continue to have functional limitations when compared to normal subjects even several years after surgery. The main purpose of this study was to investigate the effectiveness of treadmill training with partial body-weight support at improving function following total knee arthroplasty. **Subjects:** A total of 4 subjects participated in the study. Group A, n = 3 (average age 62.7) received only conventional post-operative physical therapy. Group B, n = 1 (age 71) received treadmill training with partial body-weight support two times a week for four weeks as well as conventional post-operative physical therapy.

Methods: The experimental group received a regular physical therapy program in addition to body weight support (unloading) protocol as follows: week 1: treadmill training for 15 minutes at 1.0 mph with 30% unloading, week 2: treadmill training for 20 minutes at 1.5 mph with 25% unloading, week 3: treadmill training for 25 minutes at 2.5 mph with 20% unloading, and week 4: treadmill walk for 30 minutes at 3 mph with 15% unloading.

The control group received regular physical therapy treatment on their own at an outside facility. The strength of quadriceps and hamstrings, range of motion of knee joint, and balance were measured before and after treatment in both groups and served as the dependent variables for statistical analysis. **Data Analysis:** There were 2 independent variables in this study: Group with 2 levels (treatment and control) and time with 2 levels (pre and post). The dependent variables were knee flexion and extension, quadriceps and hamstrings strength, and Timed Get Up and Go™ score. The design was 2X2 mixed design. A two-way ANOVA technique was used to analyze the data for all dependent variables. **Results:** The results of this study showed no significant difference between the 2 groups for any of the independent variables. There was a significant difference between pre and post measurements for knee flexion ($P < .009$) with an improvement of 9.5 degrees. Knee extension was significantly better after treatment ($P < .05$) with an improvement of 4 degrees. **Discussion and Conclusion:** Based on the results of this study, both groups showed improvement in ROM for knee flexion and extension, however, there was no difference between the 2 groups. The patient who received the unloading treatment reported decrease in knee pain, more confidence in ambulation, and improvement in knee function. It is our recommendation to continue this study with large sample and equal sample size.