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Evidence Table, N=number of subjects

Databases: PubMed, EMBASE, AMED, PEdro

Title: Rehab post Total Knee Arthroplasty in Older Adults with a Focus on Balance

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| Author/Year | Purpose/Design/Subject | Intervention or Description | Measurements | Outcomes |
| Pozzi F, Synder-Mackler L, Zeni J, 2013 | Systematic Review  Databases used Medline, Embase, Cinahl, Cochrane Library, Pedro.  All studies included participants who were undergoing a unilateral TKA for OA. Average age of participants ranged from 65-73. | 19 studies included in the review.  Interventions varied. Four categories of post-operative interventions: strengthening exercises, aquatic therapy, balance training, clinical environment.  Examples: progressive lower extremity strengthening, functional training, balance exercises | Outcomes measures varied.  Examples: TUG, WOMAC, Quadriceps strength, 6-minute walk test, Single leg stance time, Knee ROM. | Outpatient physical therapy programs should include strengthening exercises & intensive functional exercises post TKA.  Best long-term outcomes under the supervision of a trained physical therapist. |
| Liao CD, Liou TH, Huang YY, Huang YC, 2013 | Randomized Controlled Trial (RCT)  N= 58 patients in experimental group, mean age 71 years old; N=55 patients in control group, mean age 72 years old.  Patients with knee osteoarthritis after total knee replacement assigned into an experimental group or control group. | Control group: received conventional functional training  Experimental group: same as control plus additional balance exercises  Intervention period lasted for 8 weeks. | Functional forward reach, Single leg stance time, Timed sit-to-stand test, Timed up-and-down stair test, Timed 10-m walk, Timed up-and-go test, and the WOMAC.  Measurements taken before and after training. | The experimental group displayed significant changes in each outcome measures (all P < 0.001).    Additional balance exercises improved patient outcomes especially functional recovery and mobility more than traditional functional training. |
| Piva SR, Gil AB, Almeida GJ, DiGioia AM; Levison TJ, Fitzgerald GK, 2010 | Double-blind, Pilot RCT  N=22 patients in control group. N=21 patients in experimental group. Mean age 68 years old.  Patients who underwent a TKA 2-6 months prior to study. | Control group: functional training program  Experimental group: functional training program plus balance exercise program.  Both programs followed by 4-month HEP. Intervention period equaled 6 weeks. | Primary: Self-selected gait speed, Chair rise test, Single leg stance time. Secondary: WOMAC, Lower extremity functional scale.  Measurements taken at baseline, after completion of supervised program, after completion of HEP. | Both groups improved lower extremity function.  Functional training program plus balance exercise program had greater gait speed, improved single leg stance time, less stiffness.  Differences between groups were not statistically significant. |
| Akbaba Y, Yeldan I, Guney N, Ozdincler AR, 2014 | Single-blind, RCT  N=60  Patients with knee osteoarthritis who had bilateral TKA. | Two exercise groups with different levels of supervision, Group 1 and Group 2.  Group 1=in-home exercise program with supervision from physical therapist 2 days/week  Group 2=same in-home exercise program with supervision from physical therapist 2x/mo  Group 3=control group | Single leg stance, TUG, Walking cadence, Stair climbing test, and WOMAC.  Measurements taken before surgery, 1 month post surgery, and 2 months post surgery. | Group 1 had significant improvements in single leg stance, TUG, Stair climbing test, and WOMAC scores at the second month (all P=0).  Group 2 reached similar scores to the control group in walking cadence.  Intensive supervision is required to observe early balance and functional improvements in patients with bilateral TKA. |
| Minns Lowe CJ, Barker KL, Dewey M, Sackley CM, 2007 | Systematic Review  Databases used AMED, CINAHL, Embase, King's Fund, Medline, Cochrane library, PEDro, Department of Health national research register.  All studies included participants who were undergoing a unilateral TKA. | 6 studies included in the review and 5 of those included in the meta-analysis.  Examples of interventions: functional weightbearing exercises, isometric strengthening exercises, gait training, and ROM exercises.  Balance-related exercises included walking exercises, chair rises, weight shifts, quarter squats, stepping over cones, wobbleboard, and step-ups.  Intervention period started no later than 2 weeks after discharge. | Outcomes measures varied.  Oxford knee score, the American Knee Society, WOMAC, knee ROM, and Bartlett patellar score. | Results from the meta-analysis demonstrated that functional exercises for 3-4 months postoperatively are beneficial for joint ROM and quality of life.  Physical therapy interventions after discharge produce short-term benefits. |
| Moffet H, Collet JP, Shapiro SH, Paradis G, Marquis F, Roy L, 2004 | RCT  N=39 patients in control group. Mean age 68 years old. N=38 patients in experimental group. Mean age 66 years old.  Participants 2 months post TKA due to knee osteoarthritis. | Experimental group= completed 12 supervised rehabilitation sessions combined with home exercises for 2 months. Each session included: strengthening exercises, functional task-oriented exercises, and endurance exercises.  Balance-related exercises included sit to stands, walking backwards, stepping laterally while crossing the legs.  Control group=received standard care | Primary: 6-minute walk test.  Secondary: WOMAC and 36-Item Short-Form Health Survey.  Measurements taken at baseline (2 months post TKA), 2 months post the intervention, and 8 months post the intervention to measure functional ability. | Individuals in the intensive functional rehabilitation group had less pain, stiffness, and difficulty in performing ADLs.  Intensive rehab post TKA produces better outcomes one year after surgery. |
| Pua YH, Clark RA, Ong PH, 2015 | Cross-sectional study  N=89 inpatients. Mean age 67 years old.  Patients with knee osteoarthritis who had a TKA. | A multivariable proportional odds prediction model was constructed.    Predictor variables: age, sex, body mass index, knee pain, knee range-of-motion, active knee lag, and standing balance.  Standing balance determined by the Wii Balance Board (WBB). Patients stood on the board without shoes and unsupported. | Outcome measure was the type of walking aid prescribed on 4 days post surgery: walking stick, narrow- and broad-base quadstick, and walking frame. | Fifty-eight percent needed a walking stick, 20% needed a narrow-base quadstick, 22% needed a broad-base quadstick, and 22% required a walking frame of the 89 inpatients.  The model comprising only WBB-derived standing balance had nearly half (44%) the explanatory power of the full. Wii Balance Board provides valid data on standing balance post TKA to help professionals prescribe walking aids. |
| Fung V, Ho A, Shaffer J, Chung E, Gomez M, 2012 | Preliminary RCT  N=50. Mean age 68 years old.  Patients after a TKA participating in outpatient PT. | Control group: traditional physical therapy session followed by lower extremity strengthening and balance exercises.  Experimental group: traditional physical therapy session followed by 15 minutes Wii Fit gaming activities.  Wii Fit games encouraged lateral weight shifting and multidirectional weight shifting. Examples: tight-rope walk, table tilt, torso twist.  Games provided visual feedback for postural balance. | Length of outpatient rehab, 2-minute walk test, knee ROM, timed standing, Activity-specific Balance Confidence Scale, Lower Extremity Functional Scale and Numeric Pain Rating Scale.  Measurements taken at baseline and every 2 weeks until discharged. | There were no significant differences between both groups in any of the outcome measures (all P value > 0.05).  Wii Fit games that focus on balance and postural control can be used as an adjunct to traditional physical therapy for patients post TKA. |
| Webster K, Feller J, Wittwer J, 2006 | Observational Study  N=36. Age range from 58-64 years old.  Participants who were community-dwelling status post TKA. | Participants completed measures to evaluate balance confidence, self-efficacy, and function.  All data completed in one session. | Falls Efficacy Scale, Activity-specific Balance Confidence Scale, General Self-Efficacy Scale, American Knee Score-function score, Oxford-12 knee score, and Walking speed. | Participants with better functional status and reported less difficulties with ADLs had greater balance confidence. Overall, women scored lower than men on all measures. |

# References

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