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| **Student Name: Jonathan Samuelson** | | | | | | | |
| **Effect of exercise on activities of daily living (ADL) and functional performance.** | | | | | | **Searches: Cochrane, Pedro, PubMed, CINAHL** |
| **Author/Year** | **Purpose** | **Design** | **Subjects** | **Intervention** | **Outcomes** | **Results** | |
| **Effects of strength training on function** | | | | | | | |
| Chou et al. 2012 | To determine whether exercise affects physical function, ADLs and quality of life (QOL).  Systematic Review w/meta-analysis; 8 trials. | Systematic Review w/meta-analysis; 8 trials. | N=1068, Aged 75.3-86.8. | Flexibility, low or intensive-resistance, aerobic, coordination, balance, Tai-Chi exercises, practice of ADLs; and task-oriented or gait training.  60- to 90-minute sessions, repeated daily or weekly for 3 to 12 months. | TUG, gait speed, BBS, ADL questionnaires, QOL. | Exercise helps to increase gait speed, improve balance and ADL performance in older adults. TUG and QOL unchanged. | |
| Liu and Latham. 2009 | To examine whether progressive resistance strength training (PRT) improve physical function in older adults. | Systematic review; 121 RCTs. | N=6700. Specific ages not available. | Progressive resistance training conducted 2-3x/week at moderate to high intensity by using exercise machines, free weights, or elastic bands | Strength, walking, climbing steps, sit<>stand | PRT effective for improving strength and physical functioning in older adults, including walking, climbing steps, or standing up from a chair more quickly. Also improvement in activities such as bathing and meal preparation. | |
| Valenzuela. 2012 | To determine whether progressive resistance exercise (PRT) improve strength and functional performance in older adults living in nursing homes.  . | Systematic Review; 13 studies. | Mean age range 80-89. | Progressive resistance exercise. | Muscle strength, gait speed, functional performance, sit to stand, stair climbing, balance and functional capacity. | Statistically significant increases in muscle strength and functional performance from progressive resistance exercise, even in advanced age. PRT is effective in maintaining independence, by improving ADL performance. Limitation is small sample size in studies. | |
| **Functional training versus traditional strength training on functional performance** | | | | | | | |
| Krebs et al. 2007 | To determine whether high-intensity functional training (FT) or strength training (ST) improves function among disabled community-dwelling elders. | Randomized, blinded, prospective clinical trial in a large,  tertiary care outpatient rehabilitation department. | Fifteen elders (62–85 years old). | 6 weeks of functional training (FT)-weekly outpatient visit and three to five times per week of home practice in execution of locomotor activities of daily living including: gait, stepping,  and sit to stand or strength training (ST) using elastic bands with therapist contact, and home practice similar to those of FT. | Lower extremity strength, gait speed and  chair rise. | Subjects in both interventions improved their gait speed, but the FT group improved more than the ST group during chair rise. FT group improved their maximum knee torque more than the ST group due to a more controlled and efficient movement strategy. | |
| Olivetti et al. 2007 | To determine the feasibility and effectiveness of a weight-bearing (WB) strengthening program compared with that of  a traditional non-weight-bearing (NWB) strengthening program for older inpatients undergoing rehabilitation.  . | RCT. | N=88 inpatients, mean age 82, from three rehabilitation units with no contraindications to exercise. | Both the (WB) and (NWB) strengthening programs were supervised by PT’s  and were of similar intensities (10 to 15 RM) for two weeks. | Primary outcomes: standing up performance measured as minimum chair height.  Secondary outcomes: mobility measures such as standing-up rate, walking and overall mobility. | After the two-week intervention, the WB strengthening group had decreased their minimum chair height by 5.3 cm (95% CI 0.7 to 9.8) more than the NWB strengthening group. There were no clinically worthwhile or statistically-significant differences between groups for STS, walking and overall mobility  The WB strengthening program was feasible and safe with some additional benefits versus a traditional NWB strengthening program in an inpatient setting. | |
| Sherrington et al. 2004 | To compare the effects of weight-bearing (WB) and  non–weight-bearing (NWB) home exercise programs and a control  program on physical ability (strength, balance, gait, functional  performance) in older people who have had a hip fracture. | RCT. | N=120, 40 per group ( 79+/-9), 90% completed the 4-month retest. | Home exercise prescribed by a physical therapist.  Weight-bearing (WBE): Performed in WB position. Exercises included: 1) Sit-to-stand 2) lateral step-ups using 3) forward step-up-and-over; stepping onto a block with both legs and then off, 4) forward foot taps; 5) stepping grid; multi-directional steps using marks on the floor.  Non-weight-bearing (NWBE): performed in a supine, non-weight-bearing position. Exercises included: 1) Hip abduction, 2) hip flexion, 3) hip and knee flexion/extension, 4) end of range knee extension (SAQ) using a wedge and 5) ankle dorsiflexion/plantarflexion. | Strength, balance, gait,  functional performance, functional reach.  Step test (# of times stepping up onto a block in 15 seconds), 6 MWT  Physical Performance and Mobility Examination (PPME)-bed mobility, transfer skills, multiple stands from a chair, standing  balance, step-up ability, and ambulation. | At the 4-month retest there were differences between  the groups in amount of improvement since the initial  assessment for balance and functional performance, but not for strength or gait. WB exercise group showed the greatest improvements in balance and functional performance.    WB home exercise can improve balance and functional ability to a greater extent than a NWB program or no intervention for patients who have completed usual care, post fall-related hip fracture. | |
| **Effect of functional training on function** | | | | | | | |
| Rosendahl et al. 2006 | To determine if a high-intensity functional exercise program improves balance, gait ability, and lower-limb strength in older persons dependent in activities of daily living. | RCT. Randomised to a high-intensity functional exercise program or control activity consisting of 29 sessions over 3 months, as well as to protein-enriched energy supplement or placebo. | N= 191 (aged 65-100) dependent in ADLs, living in residential care facilities, with a Mini-Mental State Examination  (MMSE) score of ≥ 10. | Program of functional exercises consisting of everyday tasks using leg strength, postural stability, and gait. Exercises performed in WB positions. Included squats, turning trunk and head while standing, and negotiating obstacles. | Berg Balance Scale,  self-paced and maximum gait speed were followed-up at three and six months | High-intensity functional exercise has positive long-term effects on balance and gait ability for older persons who are ADL dependent. | |
| **Effects of mixed exercise interventions on function** | | | | | | | |
| Eyigor et al. 2007. | To determine the effect of a group-based exercise program on physical  performance, muscle strength and quality of life (QOL) in older women. | Clinical trial. Subjects Performed an exercise program for 8 weeks, at the rehabilitation unit | N=20 women. Aged 70.3+/- 6.5 years. All subjects were ADL independent. | Resistance exercises consisting of traditional upper and lower body strength training using free weight and ankle weights.  Balance exercises using balance board and mini-trampoline.  Functional exercises including: calf raise, squat, and sit<>stand.  Also tandem walking, forward/backward stepping, weight transfers from one leg to the other, toe raises, the heel lift (toes off the floor), and standing on one leg. | 4-meter and 20-meter walk test, 6-min walk test, stair climbing and chair rise time, TUG | Decreases in 4 m and 20 m walking times. Increase in 6MWT. Decreases in STS, TUG, stair climbing. | |
| Venturelli et al. 2010  . | Goal was to determinate the effects of physical training in  older adults with mobility limitations. | RCT. Randomly assigned to a training or control group | N=30. Aged (84+/-6 years) Subjects were frail woman. | 12weeks of upper  body physical training (UBT) performed sitting on wheelchairs.  Strength training using elastics and barbells.  Sticks and sponge balls were used in the warm-up and for flexibility. | Back scratch, Barthel index | Trained subjects showed significant improvement in arm strength (+29%), and shoulder flexibility (+10cm.  The activities of daily living (ADLs) improved (+77%).  UBT in dependent older women with mobility limitations can increase strength and ADL performance. | |
| Baum et al. 2003. | To determine whether a strength and flexibility program improves function in adults in LTC facilities. | Prospective, randomized, controlled, semi-crossover trial)  Two groups: exercise (EX) or recreational therapy  (C). Intervention continued for 1 year in the EX group. In the C group, recreation continued for 6  months🡪 crossed over to the  same exercise intervention as EX group and followed  for 6 months.  . | N=20. Aged 75-99. | EX group met 1 hour three times per week. Sessions included seated range of motion (ROM) exercises and  strength training using equipment including: elastic resistance bands and weights. The  C group met three times per week and participated in  activities such as painting during the first 6 months, before crossing over to exercise. | TUG, Berg balance scale (BBS), Physical  Performance Test (PPT). Functional outcomes  measured at baseline and 3, 6, 9, and 12  months for both groups | TUG time decreased by 18 seconds, PPT scores increased by 1.3 and BBS scores increased by 4.8 on average. Except for the BBS, 90% confidence intervals excluded 0. | |

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