

Table 1 – Part 1

The remaining 12 original investigations were related to RT with either mild or moderate to large degrees of metastability. RT=resistance training, MRT=metastability resistance training, BT=balance training.

STUDIES	TRAINING MODE	EXERCISE TYPES	EXERCISE MODALITY	METASTABILITY RANGE	TRAINING DURATION	TESTING OUTCOMES	SUBJECTS	MEAN AGE	HEALTH STATUS
Johnen & Schott (2018)	machine based RT vs. free weights RT	upper body, lower body: 5 RT machine exercises vs. 5 RT free weight exercises with dumbbells corresponding to the same muscle groups	progressive RT: machine exercises with 2 sets of 18-20 reps at 75-80% 8RM vs. progressive RT: free weights with 2 sets of 10-12 reps with 1 - 7 lbs dumbbells	mild	12 w – 2x 45-60 min /w	subject blinded testing; primary: 11-step stair climb, 10m walk, timed-up-and-go, 30-s chair rise, grip strength, BMI	N = 29 (RT machine n=14, 8 female; RT free weight n= 15, 12 female)	83.8 ± 8.0 y	healthy institutionalized nursing home residents
Schott et al. (2019)	machine based RT vs. free weights RT	upper body, trunk, lower body: 5 RT machine exercises vs. 5 RT free weight exercises	progressive RT machine and RT free weight exercises: 3 sets of 10-12 reps at 70-80% 10RM	mild	26 w – 2x 75-90 min /w	primary: dynamic, isometric strength and endurance	N = 32 (RT machine n=16, 11 female; RT free weight n= 16, 11 female)	66.9 ± 5.5 y	healthy trained
Balachandran et al. (2016)	seated machine RT vs. standing cable RT	two multi-joint upper body and lower body exercises with VR2 Cybex machine (seated machine RT) or Cybex Bravo Pro cable device (standing cable RT)	progressive RT exercises with 3 sets of 12 reps at 50% of 8-10RM	mild	12 w – 2x N.A. /w	primary: Physical Performance Battery, measures of physical function; secondary: lower and upper body strength, power, activities of daily living	N = 22 (RT machine n=10, 6 female; RT cable n=12, 6 female)	69.6 ± 4.0 y	healthy normal
Schlenstedt et al. (2015)	RT vs. BT	RT: 7 freely coordinated lower body exercises with own weight, cuff weights, and elastic bands vs. BT: 7 stances exercises	progressive RT: 3 sets of 15-20 reps to fatigue at 20RM vs. progressive BT	mild	7 w – 2x /w, 50 min	rater blinded testing; primary: balance scale; secondary: center of mass displacement during surface perturbations, timed-up-and-go, gait analysis, leg strength, clinical tests	N = 32 (RT n = 17, 5 female; BT n = 15, 6 female)	75.7 ± 6.4 y	idiopathic Parkinson's disease
Silva-Batista (2016)	Control vs. RT vs. MRT	RT: 5 lower body and trunk exercises; MRT: 5 lower body and trunk exercises with added instability devices	progressive RT and MRT with 2-4 sets of 6-12 reps (high-volume low-intensity to low-volume high-intensity loads)	moderate to large	12 w – 2x 50 min /w	primary: timed-up-and-go; secondary: on-medication motor signs, cognitive impairment, quality of life, and lower limb strength	N = 39 (control n = 13, 4 female; RT n = 13, 3 female; MRT n = 13, 3 female)	64.2 ± 9.2 y	moderate to severe conditions of Parkinson's disease
Silva-Batista (2017)	Control vs. RT vs. MRT	RT: 5 lower body and trunk exercises; MRT: 5 lower body and trunk exercises with added instability devices	progressive RT and MRT with 2-4 sets of 6-12 reps (high-volume low-intensity to low-volume high-intensity loads)	moderate to large	12 w – 2x 50 min /w	primary: H-reflex in soleus muscle to analyze presynaptic inhibition and disinaptic reciprocal inhibition	N = 39 (control n = 11, 2 female; RT n = 13, 3 female; MRT n = 13, 3 female)	64.2 ± 9.2 y	moderate to severe conditions of Parkinson's disease
Silva-Batista (2018)	Control vs. RT vs. MRT	RT: 5 lower body and trunk exercises; MRT: 5 lower body and trunk exercises with added instability devices	progressive RT and MRT with 2-4 sets of 6-12 reps (high-volume low-intensity to low-volume high-intensity loads)	moderate to large	12 w – 2x 50 min /w	primary: Balance Evaluation System Test, Biodex Balance System, falls efficacy scale; secondary: peak torque in isometric contraction tests of the knee extensor and plantar flexor muscles	N = 39 (control n = 13, 4 female; RT n = 13, 3 female; MRT n = 13, 3 female)	64.2 ± 9.2 y	moderate to severe conditions of Parkinson's disease

Table 1 – Part 2

The remaining 12 original investigations were related to RT with either mild or moderate to large degrees of metastability. RT=resistance training, MRT=metastability resistance training, BT=balance training.

STUDIES	TRAINING MODE	EXERCISE TYPES	EXERCISE MODALITY	METASTABILITY RANGE	TRAINING DURATION	TESTING OUTCOMES	SUBJECTS	MEAN AGE	HEALTH STATUS
Granacher et al. (2013)	Control vs. MRT	MRT: core instability exercises on fitness mats with unstable training devices but not resistance training machines	progressive MRT exercises with 3–4 sets of 15–20 s contraction time (static condition) or 15–20 reps (dynamic condition)	moderate to large	9 w – 2x 60 min /w	primary: dynamic balance, functional mobility, spinal mobility, trunk muscle strength	N = 32 (control n = 16, 8 female; MRT n = 16, 9 female)	70.6 ± 4.3 y	healthy normal
Eckardt (2016)	RT vs. MRT1 vs. MRT2	RT: leg press, Smith machine; MRT1: leg press, Smith machine with added instability devices; MRT2: free weights on unstable platforms	progressive RT and MRT exercises with 2–4 sets and 12 repetitions at 50-60% 1RM	moderate to large	10 w – 2x /w, 60 min	primary: isometric leg extension strength, functional reach test, chair rise test; secondary: falls efficacy scale, cognitive measures	N = 75 (RT n = 27, 17 female; MRT1 n = 26, 13 female; MRT2 n = 22, 13 female)	70.4 ± 4.3 y	healthy normal
Piraua et al. (2019)	Control vs. RT vs. MRT	RT: lower limb, trunk, and upper limb exercises; MRT: lower limb, trunk, and upper limb exercises with added instability devices	progressive RT and MRT exercises with 2-5 sets and 7-12 reps at 8-12 RM	moderate to large	24 w – 3x N.A. /w	primary: dynamic balance (Berg Balance Scale) and functional mobility (timed-up-and-go test); secondary: sitting and rising test and falls efficacy scale	N = 64 (control n = 14, 14 female; RT n = 25, 22 female; MRT n = 25, 22 female)	67.8 ± 5.3 y	healthy normal
Eckardt & Rosenblatt (2019)	RT1 vs. RT2 vs. MRT	RT1: leg press, Smith machine; RT2: adductor and abductor machine and elastic band exercises; MRT: free weights on unstable platforms	progressive RT and MRT exercises with 3-4 set and 15 reps at 60% 1RM stable	moderate to large	10 w – 2x 60 min /w	primary: uncontrolled manifold analysis; secondary: timed-up-and-go, multidirectional reach, leg strength, 5 times sit-to-stand	N = 68 (RT1 n = 24, 16 female; RT2 n = 23, 13 female; MRT n = 21, 12 female)	70.2 ± 3.9 y	healthy normal
Eckardt et al. (2020)	RT1 vs. RT2 vs. MRT	RT1: leg press, Smith machine; RT2: adductor and abductor machine and elastic band exercises; MRT: free weights on unstable platforms	progressive RT and MRT exercises with 3-4 set and 15 reps at 60% 1RM stable	moderate to large	10 w – 2x 60 min /w	primary: executive functions; secondary: falls efficacy scale	N = 68 (RT1 n = 24, 16 female; RT2 n = 23, 13 female; MRT n = 21, 12 female)	70.2 ± 3.9 y	healthy normal