

Bilateral Pole Walking Effects Evidence Table - Older Adults

Author/Year Title Journal/Country	Study Design & Purpose	Participants	Intervention	Measures	Results	Conclusions	Relevance/ Comments
Koizumi et al (2011) <i>Load dynamics of joints in Nordic walking</i> (Japan)	Cross-Sectional Kinematic analysis of NW & W on level and stairs to examine jt load reduction	n=5 67.3±1.6 yrs NW practitioners healthy	Multiple walking trials w/ and w/o poles on level surface and up and down steps w/ force platforms	Data from force platforms & motion analysis - calculation of LE jt reaction forces & jt moments	Compared w/ W, NW has ↓load reduction on L4&L5 shear force, hip compression & shear forces, and knee shear forces on level surfaces, Some ↓in LE jt reductions up stairs w/ NW, no load reduction w/ NW down	NW may have an unloading effect on hip jt w/ compressions and shear forces and knee shear forces (but not knee unloading) on level surfaces & up steps.	Study shows interesting differences btw compression and shear forces w/ regarding to LE jt loading.
Takeshima et al (2013) <i>Effects of Nordic Walking compared to Conventional Walking and Band-Based Resistance Exercise on Fitness in Older Adults</i> (Japan)	Non-randomized Controlled Trial Compare NW, W and resistance ex benefits in elderly polulation	n=65 into 4 groups NW=17, W=16, RES=15, C=17 68-70±5 yrs 28M, 37F	NW & W -50-70 min 3x/wk -12wks RES - 50-70 min /2x/wk for 12 wks warm up 10-15 min, main ex 30-50, cool down 10-15min C - no ex	12MWT, arm curl test, Sit-stand, TUG, Back-scratch, Chair Sit<>Stand, Borg RPE, Static & dynamic balance-Balance platform system, HR monitor 100-120 bpm, accelerometer during ex	•NW (11.6%) & RES (22.3%) group - Upper body strength improved (p=0.05) compared to W & C groups • NW & W - more improvements in NW (10.9%) & W (10.6%) groups compared w/ RES & C groups. • Flexibility improved in all ex groups • no improvements in balance measures	NW provided best well-rounded benefits by improving upper body strength, CV endurance & flexibilitiy - for overall fxal fitness in older adults.	UE strength assessed solely by arm curl - additional research needed on more specific possible NW strengthening effects for shoulder/UE
Breyer et al (2010) <i>Nordic Walking improves daily physical activities in COPD: a randomised controlled trial</i> (Austria)	RCT* Explore feasibility of NW intervention for pts w/ COPD	n=60 30 in ea group: NW & C COPD FEV1:48±19% 62 ±9 yrs	NW : 1 hr, 3x/wk for 3 months C : no ex intervention Both groups-weekly COPD ed session	•6MWT •validated tri-axial accelerometer: daily physical activity •3, 6, & 9 mos assmt	NW group: SS↑(p<0.01) in walking time, movement intensity, standing time, and ↓time sitting & ↑6MWD compared w/ baseline & controls. Improvements also sustained @ 6mo & 9 mo	For pts w/ COPD, NW may be simple and useful intervention to improve & promote daily physical activity.	SS improvements for NW group noted in improved mood status & HrQOL & less ex-induced dyspnea

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Reuter et al (2011) <i>Effects of a Flexibility and Relaxation Programme, Walking, and Nordic Walking on Parkinson's Disease</i> (Germany)	RCT* Compare effects of NW & W programs and non-aerobic ex (FR) program to determine best ex choice for individuals w/ PD	n=90 30 in ea group: NW, W, & FR PD Stg II & III 62-63±3 yrs	<ul style="list-style-type: none"> •70 min, 3x/wk for 6 mos NW & W groups- outdoors, warm-up & cool-down period FR group- @ gym, focusing on stretching, balance, & mvmt range w/o aerobic activity. 	12 m & 24 m Webster walking tests, Gait asmt, Ex test and max walking speed on treadmill ergometer UPDRS, HRQoL, PDQ39 - PD, Pain VAS, BBS, Borg RPE Secondary outcome measures -activity logbook, adverse effects, 6 mo followup contact	<ul style="list-style-type: none"> • SS↑(p=.02) in NW & W group in the motor function subscale. • NW group showed improved postural stability (p<.004) and gait pattern (p<.001), and improving stride length (p<.05) than other 2 groups • HRQL- PDQ39 scores improved in all groups, p<0.001 • Pain-VAS- pain of back, hands and legs decreased more in W & NW groups than FR group (p<.002) 	<ul style="list-style-type: none"> * All ex programs had + effects, but NW achieved largest effects in reduction of PE-specific disability & pain, improved gait & physical activity and HRQoL. * Pts w/ PD may need more time to learn & practice NW and take longer period to graduate intensity. 	A few adverse effects reported during study, including ex-induced hypotension (NW=2, W-1), falls (NW-4, W-4, FR-1), shoulder overuse injury (NW-2)
Keast et al (2013) <i>Randomized Trial of Nordic Walking in Patients with Moderate to Severe Heart Failure</i> (Canada)	RCT Single-center, parallel-group Would 12-wk NW program improve pt outcomes over stndrd ex program (SP)?	n=54 into 2 groups: NW=27, SP=27 44M, 10 F Mod/sev HF 62±11 yrs	Both groups: 200-400 min/wk for 12 wks. 1 hour class - 15 warm-up, res ex, walking or NW; standard program cardiac outpt rehab	6MWT, grip strength, HADS, peak VO2, Godin Leisure Time Ex Questionnaire	NW group had SS↑ in 6MWT (p=0.001), ↑ grip strength (p=0.026), ↓ depressive sx (p=0.014) compared w/ standard care group, ↑ self-reported phys act	NW effective intervention in this study for improving functional capacity, UE strength and mood for pt sample. Long-term studies needed.	Pt baseline eligibility for study was ability to walk 10 min continuously.
Figueiredo (2013) <i>Nordic walking for geriatric rehabilitation: a randomized pilot trial</i> (Canada)	Randomized pilot trial Estimate NW intervention efficacy for elderly persons in rehab setting	n=30 into 2 groups: NW=14, W=16 13M, 17 F rehab setting 77 (65-92) yrs	<ul style="list-style-type: none"> • 20 min, 2x/wk for 6 weeks . NW group provided • Warm-up, W/NW & cool-down. 1:1 PT • NW-trng session 	BBS LE Fx Scale (LEFS) Pain: VAS-0/100, 6MWT, 5m WT	Both groups improved in walking speed, NW 106% more efficient in improving gait speed. NW Effect size: 6MWT= 0.53(mod) Effect size:gait spd =0.68(high)	NW feasible intervention in in-pt & out-pt settings for elderly rehab. 2MWT may be more sensitive test for some pts. Longer sessions also recommended.	Rehab setting application for elderly pts, majority used walker or cane as AD, but did not use during NW intervention.