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Effect of Crip Walking on Walking Abilities in Community Dwelling Older Adults

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ABSTRACT

Background: Walking ability can be severely hampered by age-related physiological changes in older persons, which raises the risk of falls and functional deterioration. Even if they work, traditional rehabilitation techniques can have little engagement, which leads to poor adherence. This research investigates the use of Crip Walking, a rhythmic street dance with quick footwork and dynamic balancing demands, as a creative intervention to enhance older individuals' gait and mobility.

Method: In this randomized controlled trial, 50 community-dwelling older adults from age 60 and above were recruited. Participants were randomly assigned to either the Crip Walking intervention (n=25) or the High-Resistance Training (HRT) intervention (n=25). Both interventions were delivered three times weekly for four weeks, with each session lasting 45–60 minutes. The primary outcomes were the Dynamic Gait Index (DGI) and Timed Up and Go (TUG) test, which were assessed pre- and post-intervention.

Results: It is notable that improvement in both DGI and TUG scores ($p<0.001$) was seen in both groups**.** The Crip Walking group, though, showed greater improvements compared to that of the HRT group, with a higher post-intervention DGI (22.68 ± 1.6) and shorter TUG time (9.47 ± 1.27 seconds) compared to the group (DGI: 21.28 ± 1.49; TUG: 10.33 ± 1.60 seconds).

Conclusion: Crip Walking is a enjoyable, and effective intervention to improve gait, balance, and mobility in older adults. Its engaging, rhythmic style may increase adherence and provide a culturally inclusive substitute for conventional rehabilitation.

Keywords: *Crip Walking, older adults, dance therapy, dynamic balance.*

1. INTRODUCTION

Natural physiological changes brought on by aging can have a major effect on one's capacity to walk. Men and women in the 50–60 age range who live in the community suffer from age-related decreases in their strength, balance, and coordination. Mobility impairments are more likely to affect both sexes, while the rate and pattern of decline may vary depending on factors such as body composition, hormone changes, and muscle mass. To maintain their freedom and provide a high quality of life, these individuals must be able to walk (1).

Age-related declines in walking ability are a widespread concern for a number of reasons. Reduced mobility and a higher risk of falls are caused by a variety of factors, including loss of muscle strength, especially in the lower limbs, poor proprioception, and reduced joint flexibility. Step length tends to shorten, walking speed tends to slow, and balance is affected. These alterations may also result in a decrease in walking confidence, which could lead to a more sedentary lifestyle and increase the risk of chronic diseases and functional decline in addition to impairing physical function (2).

The treatment regimens aimed specifically at the aforementioned geriatric problems for the improvement of walking ability are many. Conventional activities are used for the improvement of physical functions and decrease the risk of falls, whereby strength training, balance, and aerobic exercises fall under these therapies (3).

Of late, dance-based therapies have gained attention due to their capability of imparting a social, cognitive, and physical benefit. Dance includes the styles of ballroom, tango, and tai chi that have reported improvements on gait, balance, and gross mobility (4).

Nevertheless, for certain older adults, these well-established routines can be boring and uninteresting, thus in some cases leading to very low compliance (5).

As a result, there is growing interest in exploring more innovative and culturally adaptive movement approaches that can offer an incentive for seniors to engage in activity. C-Walking or Crip-Walking is a street dance type. Mostly, it uses very rapid footwork movements combined with rhythmic weight shifts to form complex patterns of lower extremity movement. It calls for good coordination, balance, and excellent neuromuscular control. Therefore, from these attributes, it seems that this form of dancing could potentially be a way of gait training. The dance style even goes further into rhythmic freeing, interactive fun that makes it quite different from exercise in standard interventions (6).

The purpose of this study is to ascertain how Crip Walking affects the walking abilities of community-dwelling older persons (ages 50–60). Walking speed, gait characteristics related to balance, and functional mobility are the particular gait elements of importance. The acceptability, safety, and viability of a structured Crip Walking program in this population will also be investigated. With this creative, culturally diverse intervention, the study hopes to advance knowledge of movement-based rehabilitation techniques and provide a fun, useful substitute for enhancing older persons' walking abilities and quality of life (7).

Crip Walking is one of the movement-centered innovative exercises that can be useful in treatment modalities and provide a fun method for developing motor coordination, rhythm, and functional walking ability in a therapeutic setting. This involves rhythmic foot movements, weight shifts, and very precise patterns- and they have probably meant for improved walking performed across better control, balance, and strength in the lower limbs through neuromuscular mechanisms. This novel and participatory exercise may also offer a socially engaging way to improve functional mobility, making it appealing for community-based rehabilitation (8).

Also, this study will assess how the rhythmic, dynamic component of Crip Walking affects the parameters of gait and the therapy that could preserve or improve mobility. The amount of energy and fluidity evidenced in Crip Walking will produce some specific advantages for balance training because they can be tested against stability in order to prove the benefit of Crip Walking as a fresh alternative to traditional exercises for balance training (9).

This study will evaluate the feasibility and acceptability of Crip Walking, in addition to its effectiveness, to ensure individual and community application. Hence, if Crip Walking proves effective in reducing the fall risk, it may become an affordable and interesting intervention for older adults who constitute a significant public health issue related to aging populations (10).

Shifting the focus from conventional rehabilitation activities to culturally relevant ones will, of course, facilitate inclusion in exercise programs for people from disadvantaged backgrounds or marginalized groups. Because of the unique rhythmic complexities and movement patterns required in Crip Walking, it makes very different demands on balance, coordination, and gait mechanics than conventional balance or gait-training exercises. This novel approach will allow us to delve further into the interesting areas of motor learning and adaptability in older populations (11).

Yet the physical gains could be complemented by advantages for psychological improvement and social interaction, which are almost always ignored in mobility-related investigations. The safety, feasibility, and acceptability of Crip Walking will be determined in showing how this fun and nonconventional exercise can serve older adults' needs (12).

As diminished physical functions are becoming highly prevalent as a consequence of aging, interventions aimed at conserving mobility would be crucial. Reduced walking speed, impaired balance, and heightened risk of falls in community-dwelling older adults are issues that can affect independence and reduce quality of life. Dance-based interventions, such as Crip Walking, may improve gait performance, balance, and walking endurance while promoting participant enjoyment (13).

If proven effective, Crip Walking has the potential to be a novel, low-cost, and fun intervention that encourages active-aging practices, improved mobility, and fall prevention for older adults. This research endeavors to extend the already existing rehabilitation methods that incorporate dance for the elderly and to introduce Crip Walking as a plausible therapeutic option to improve gait and functional mobility (14).

2. METHODS

The study had an ethical clearance from the institutional review board and board for research ethics and was conducted with study participants to understand the effect of Crip Walking on walking efficiency in community-dwelling older adults. A total of 50 subjects were recruited for this study, randomly assigning them into two groups for the purpose of this study: Group A (Experimental) having an intervention as Crip Walking (n=25) and Group B (Control) with an intervention as High Resistance Training (n=25). Eligibility criteria were: individuals aged 60 years and older, independent ambulation with or without assistive devices, and without severe cognitive limitations (greater than 24 MMSE) and were older community-dwelling adults. The subject excludes those who are clinically diagnosed with a severe gait disorder of neurological origin, severe musculoskeletal impairments, or uncontrolled cardiovascular/metabolic disease. The intervention lasted four weeks, with each of the three sessions a week being between 45 -60 minutes long. All sessions were under supervision and monitored

to track progress made by the participants during the intervention. The sessions for Group A (Crip Walking) consisted of organized rhythmic footwork patterns, directional changes, endurance drills, and increasingly complex steps performed indoors and outdoors using music. Group B followed a 4-week High-Resistance Training (HRT) program three times per week, each session lasting between 45-60 minutes with 10 minutes warm-up, 30-40 minutes main resistance training, and 5-10 minutes cool-down. The program was designed on the basis of recommendations made by the American College of Sports Medicine (ACSM, 2018) and the National Strength and Conditioning Association (NSCA) (Fragala et al., 2019).

Group A: Crip Walking Intervention

Week	Treatment Goals	Warm-up (10 min)	Intervention (30–40 min)	Cool-down (5–10 min)
Week 1	Familiarization with basic movements and coordination	Light walking (5 min), Dynamic stretching (ankle rolls, knee lifts), Gentle arm swings	Introduction to basic Crip Walking steps (shuffle, side-to-side), Slow-paced movements emphasizing coordination, 2–3 sets of 1-minute practice drills	Static stretching (quadriceps, hamstrings), Deep breathing exercises
Week 2	Development of rhythmic footwork and balance	Light walking (3–5 min), Ankle and knee mobility drills	Integration of rhythm-based movements, Introduction of progressive step patterns, Footwork drills with increasing tempo	Standing static stretches (calves, hip flexors), Relaxation techniques
Week 3	Enhancement of agility and directional control	Dynamic stretching (5 min), Marching in place (2 min)	Introduction of speed variations, Directional changes (pivots, turns), Increased step complexity	Seated static stretching, Breathing control exercises
Week 4	Integration of endurance and fluid movement patterns	Mobility drills (5 min), Light walking with increased tempo	Continuous movement sequences with music, Longer duration sets (3–5 min per drill), Progression to freestyle combinations	Full-body stretching routine, Controlled breathing for recovery

Group B: High-Resistance Training Intervention

Week	Treatment Goals	Warm-up (10 min)	Intervention (30–40 min)	Cool-down (5–10 min)

Week 1	Familiarization with strength exercises and movement mechanics	Light aerobic activity (e.g., walking, cycling); joint mobility exercises	Lower body: Bodyweight squats, step-ups (2–3 sets); Upper body: Resistance band rows, bicep curls; Core: Seated leg raises, stability exercises	Static stretching (quadriceps, hamstrings, shoulders); breathing control exercises
Week 2	Progression in strength and endurance	Dynamic stretching (lunges, arm circles); balance drills	Light weights or bands; higher reps (10–15); introduction of controlled eccentric movements	Seated static stretching; deep breathing for recovery
Week 3	Strength adaptation with moderate load	Moderate-intensity cardio (cycling, brisk walking); mobility drills	Increase resistance to ~60% 1RM; functional strength (sit-to-stand, deadlifts); core with added resistance	Full-body stretching routine
Week 4	Development of strength endurance and functional mobility	Dynamic warm-up with integrated movements	Resistance ~70–75% 1RM; increase reps, reduce rest; multi-joint movement patterns	Relaxation techniques; static stretching for recovery

3. RESULT

An Excel sheet was used to record the data, and "instat software was used to perform the statistical analysis. Descriptive statistics were used in the statistical analysis, and the paired t-test was employed to determine whether there were any significant differences between the groups' pre- and post-training states.

1. Effect on Dynamic Gait Index (DGI)

The DGI scores significantly improved in both groups post-intervention, indicating enhanced dynamic balance and gait adaptability.

Intragroup Comparisons (Pre vs. Post)

Group	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	t-value	p-value	Effect Size (Cohen's d)
Group 1 (Crip Walking)	18.8 ± 1.658	22.68 ± 1.600	24.839	< 0.001	2.38 (Very Large)
Group 2 (High Resistance Training)	18.52 ± 1.475	21.28 ± 1.487	17.718	< 0.001	1.86 (Large)

Both groups showed significant improvements, but Group 1 (Crip Walking) demonstrated greater improvements in dynamic balance, as indicated by the higher post-intervention mean score and effect size.

Intergroup Comparison (Post-Intervention DGI Scores)

Group	Mean ± SD	t-value	p-value

Group 1 (Crip Walking)	22.68 ± 1.600	8.419	< 0.001
Group 2 (High Resistance Training)	21.28 ± 1.487		

The higher post-intervention DGI score in Group 1 suggests that Crip Walking was more effective in improving gait adaptability and balance compared to Resistance Training.

2. Effect on Timed Up and Go (TUG) Test

The TUG test times significantly decreased in both groups, indicating improved mobility and reduced fall risk.

Intragroup Comparisons (Pre vs. Post)

Group	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	t-value	p-value	Effect Size (Cohen's d)
Group 1 (Crip Walking)	12.35 ± 1.311	9.4708 ± 1.272	29.332	< 0.0001	2.23 (Very Large)
Group 2 (High Resistance Training)	12.8468 ± 1.295	10.3272 ± 1.601	15.852	< 0.0001	1.73 (Large)

Both interventions significantly reduced TUG times, but Crip Walking led to a greater reduction, suggesting superior improvements in functional mobility.

Intergroup Comparison (Post-Intervention TUG Scores)

Group	Mean ± SD	t-value	p-value
Group 1 (Crip Walking)	9.4708 ± 1.272 sec	7.878	< 0.0001
Group 2 (Resistance Training)	10.3273 ± 1.601 sec		

The lower post-intervention TUG score in Group 1 suggests that Crip Walking was more effective in improving mobility and agility compared to Resistance Training.

- Both interventions significantly improved walking abilities, as indicated by increased DGI scores and decreased TUG times ($p < 0.001$ for all comparisons).Crip Walking demonstrated greater improvements in both dynamic balance (DGI) and functional mobility (TUG) compared to Resistance Training.

4. DISCUSSION

The present study evaluated the effectiveness of Crip Walking (CW), a rhythmic, dynamic street dance, as a novel intervention for improving walking ability in community-dwelling older adults. The results showed a marked improvement in balance and mobility, as suggested by improvements in the Dynamic Gait Index (DGI) and reductions in Timed Up and Go (TUG) test times in both intervention groups. But, improvement among Crip Walking participants was significantly higher than in the High-Resistance Training (HRT) group.

Balance, coordination, and strength naturally decline in older adults to compromise their gait and functional mobility, increasing their odds of falling and becoming dependent (15). Traditional interventions have included resistance training, which has been shown to increase lower limb strength and functional mobility (16), supported by pre-post significant gains in the HRT group. But on the contrary, the CW showed larger effect sizes, suggesting that Crip Walking might uniquely benefit from dynamic multidirectional footwork and rhythmic neuromuscular control engagement (17). Crip Walking possibly accentuates proprioception and neuromuscular coordination (18), given the rapid foot patterns, balance shifts, and coordinated use of limbs encompassed in this dance form. These attributes are crucial in preventing falls and enhancing gait stability, especially in older adults, in whom proprioceptive feedback might be lessened (19). Thus, the improvement in DGI scores in the CW group would support the theory of an enhancement in dynamic balance and adaptability of gait.

The larger reduction in TUG times seen in CW participants would indicate an increase in functional mobility, said to be a result of the dance's focus on quick direction changes and stepping speed, which corresponds with previous findings that dance-based interventions such as tangoing and folk dancing have improved TUG performance and mobility outcomes for older adults (20,21).

Furthermore, the social dance element of Crip Walking, based on music, arguably would improve adherence and enjoyment much more than regular training programs, which often lack such qualities (22). Group dance interventions have been shown

to incorporate social and cognitive aspects, which enhance mental health and retention in older adults (23). HRT still remains a viable option but does not integrate the cognitive and emotional engagement afforded by culturally relevant, rhythmic physical conditioning such as CW. Most importantly, this study has confirmed the feasibility and safety of CW. Adverse events were not reported, and participation in the 4-week program was highly adhered to. This confirms that CW can present itself as a very viable and low-cost intervention adaptable to community settings. Further, our findings support the literature that promotes new movement-based rehabilitation strategies fitted with the preference and capabilities of older adults (24,25). More studies are necessary to endorse this finding over longer times and with greater populations, but Crip Walking seems to be a valid therapeutic approach for enhancing gait, balance, and mobility.

5. CONCLUSION

This study provides preliminary evidence that Crip Walking can be an enjoyable and effective method to enhance walking abilities in community-dwelling older adults. By integrating rhythmic movement with cognitive engagement, Crip Walking offers a novel approach to improving mobility and reducing fall risk. Future research should expand on these findings by incorporating larger sample sizes, long-term follow-ups, and exploring additional biomechanical and neurocognitive outcomes. Moreover, investigating the role of rhythmic cueing and the social aspects of dance-based interventions in improving gait and balance would provide deeper insights into its effectiveness.

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