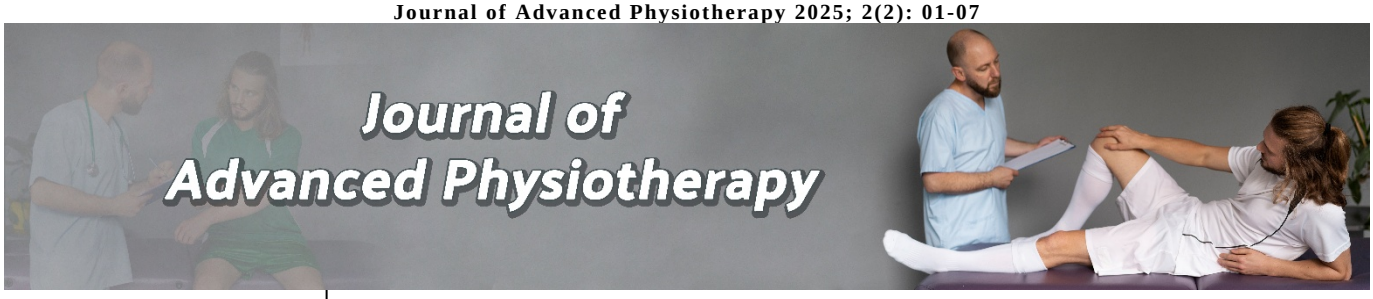

P-ISSN: 3081-0604
E-ISSN: 3081-0612
JAP 2025; 2(2): 01-07
www.physiotherapyjournal.org
Received: 02-07-2025
Accepted: 04-08-2025

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Effectiveness of task-oriented circuit training on gait and balance in chronic stroke survivors: A randomized controlled trial

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DOI: https://www.doi.org/10.33545/30810604.2025.v2.i2.A.13

Abstract
Background: Chronic stroke survivors frequently experience persistent gait and balance impairments that limit community ambulation and participation. Task-oriented circuit training (TOCT) offers a practical means of delivering high-repetition, functionally relevant practice within usual physiotherapy resources, but evidence specific to community-dwelling chronic stroke populations remains limited.
Objective: To evaluate the effectiveness of TOCT compared with conventional physiotherapy in improving gait, balance and community ambulation status in individuals with chronic stroke.
Methods: In this single-blind randomized controlled trial, 60 community-dwelling adults ≥6 months post first-ever unilateral stroke were allocated to either TOCT (n = 30) or conventional physiotherapy (n = 30). Both groups received 60-minute supervised sessions, three times per week for eight weeks. The TOCT programme comprised 8-10 progressive functional stations targeting overground walking, obstacle negotiation, stair climbing, sit-to-stand, multidirectional stepping, balance and endurance. The control group received dose-matched impairment-based therapy and non-structured gait and balance exercises. Primary outcomes were gait speed (10-m walk test) and walking capacity (6-min walk test). Secondary outcomes included Berg Balance Scale, balance confidence and proportion of participants classified as community ambulators (gait speed ≥0.8 m/s). Assessments were conducted at baseline and post-intervention by blinded assessors, and data were analysed using intention-to-treat principles.
Results: Compared with conventional physiotherapy, TOCT produced significantly greater improvements in gait speed (mean change +0.24 vs +0.09 m/s; between-group difference 0.15 m/s, $p < 0.001$) and 6-min walk distance (+70 vs +24 m; between-group difference 46 m, $p < 0.001$). TOCT also yielded larger gains in Berg Balance Scale (+7.8 vs +2.4 points, $p < 0.001$) and balance confidence (+13 vs +4 points, $p = 0.002$). The proportion of community ambulators increased from 20.0% to 56.7% in the TOCT group versus 23.3% to 33.3% in controls ($p = 0.042$).
Conclusion: Task-oriented circuit training is superior to conventional physiotherapy for enhancing gait, balance and community ambulation in chronic stroke survivors. Integrating structured, progressive circuit-based programmes into routine rehabilitation may offer an efficient, scalable strategy to improve long-term mobility and functional independence after stroke.

Keywords: stroke rehabilitation, task-oriented circuit training, gait speed, balance, community ambulation, chronic stroke, physiotherapy, randomized controlled trial

Introduction
Stroke is a leading cause of death and long-term disability worldwide, with tens of millions of survivors living with persistent impairments and a disproportionate burden in low- and middle-income countries [1-3]. Despite advances in acute care, many individuals remain chronically disabled beyond six months after stroke, with gait and balance limitations that constrain community ambulation, social participation, and quality of life [4-6, 11, 12, 16, 17]. Clinical practice guidelines and scientific statements now emphasise intensive, task-specific walking practice and structured aerobic exercise to optimise locomotor recovery and cardiovascular health in stroke survivors [4, 5, 17]. Task-oriented circuit training (TOCT), in which multiple functional gait and balance tasks are organised into a progressive circuit of stations, offers a practical way to deliver high-repetition, task-specific practice to groups of patients within usual physiotherapy resources [6-10]. Randomized and quasi-experimental studies have shown that task-related or task-oriented circuit training can improve locomotor performance, walking distance, gait speed, and mobility in subacute and chronic stroke, as

well as enhance balance confidence and reduce mobility limitations [6-12]. Systematic reviews and meta-analyses further support TOCT and circuit class therapy for improving walking capacity after stroke, but also highlight variability in protocols, limited focus on balance outcomes, and scarce high-quality randomized controlled trials (RCTs) specifically targeting community-dwelling chronic stroke survivors [6, 9, 10, 17]. At the same time, balance impairment, fear of falling, and low falls self-efficacy are highly prevalent in this population and are strongly associated with functional mobility limitations and fall risk [11, 13-15]. Observational work shows that many chronic stroke survivors remain insufficiently active and do not meet recommended physical activity levels, reinforcing the need for effective, sustainable rehabilitation strategies that directly target gait and balance [5, 16]. However, existing trials of TOCT often prioritise walking endurance or gait speed as primary outcomes, include mixed acute and subacute cohorts, or provide limited information on balance-specific outcomes and longer-term functional gains in the chronic phase [6-12]. Consequently, there is a clear need for rigorously designed RCTs examining whether a structured, task-oriented circuit training programme is superior to conventional physiotherapy in improving both gait and balance among chronic stroke survivors. The present randomized controlled trial therefore aims to evaluate the effectiveness of task-oriented circuit training on spatiotemporal gait parameters, walking capacity, and functional balance compared with standard physiotherapy in individuals with chronic stroke. It is hypothesised that participants receiving task-oriented circuit training will demonstrate significantly greater improvements in gait speed, walking distance, and balance performance, along with better balance confidence, than those undergoing conventional physiotherapy alone.

Materials and Methods

Materials

This study was designed as a single-blind, two-arm randomized controlled trial conducted in the physiotherapy department of a tertiary-care rehabilitation centre specialising in neurological conditions, with procedures aligned to contemporary locomotor rehabilitation guidelines for chronic stroke [4, 5, 17]. Community-dwelling individuals with a diagnosis of first-ever unilateral ischaemic or haemorrhagic stroke ≥6 months prior to enrolment, aged 40-75 years, able to walk at least 10 m with or without an assistive device, and medically stable were screened for eligibility, reflecting typical chronic stroke cohorts described in previous task-oriented circuit training and locomotor trials [6-12, 16]. Exclusion criteria included severe cognitive impairment (Mini-Mental State Examination score <24), uncontrolled cardiovascular or orthopaedic conditions limiting exercise, severe aphasia preventing instruction following, other neurological disorders, or participation in concurrent intensive gait training programmes, consistent with previous work on circuit class therapy and community ambulation [6-9, 11]. A target sample size of 60 participants (30 per group) was estimated a priori based on effect sizes for gait speed and walking distance reported in earlier TOCT and task-related interventions, allowing for 15-20% attrition and ensuring adequate power to detect clinically meaningful between-group differences [6-8, 11, 12, 17]. Recruitment was achieved through outpatient stroke clinics and community-based stroke support groups, which commonly serve populations with persistent gait and balance limitations and low habitual physical activity [5, 16]. Baseline descriptive data included age, sex, time since stroke, stroke type and side, comorbidities, medication use, and prior falls history, given the strong relationship between balance, mobility, fear of falling, and falls self-efficacy in chronic stroke [11, 13-15]. All participants provided written informed consent, and the protocol was approved by the institutional ethics committee in accordance with the Declaration of Helsinki and current recommendations for exercise-based stroke rehabilitation trials [4, 5, 17].

Methods

After baseline assessment, participants were randomly allocated to either the task-oriented circuit training (TOCT) group or the conventional physiotherapy (control) group using a computer-generated random sequence with concealed allocation through sequentially numbered, opaque, sealed envelopes prepared by an independent researcher, similar to procedures adopted in previous circuit-based stroke trials [6-9, 11]. Outcome assessors were blinded to group assignment. Both groups received supervised sessions of 60 minutes, three times per week, for eight weeks, in line with recommendations for intensive, task-specific and aerobic training after stroke [4, 5, 7, 8, 17]. The TOCT programme comprised a progressive circuit of 8-10 functional stations targeting overground walking, obstacle negotiation, stair climbing, sit-to-stand, multidirectional stepping, tandem and single-leg stance, turning, dual-task walking, and endurance tasks such as paced hallway walking or treadmill walking, modelled on established task-related and circuit class protocols [6-9, 11, 12]. Intensity was monitored using heart rate and Borg's Rating of Perceived Exertion, with workload and task complexity incrementally progressed by increasing walking distance, speed, obstacle height, and dual-task demands, reflecting the principles of specificity, repetition, and progressive overload [4, 5, 7, 8, 17]. The control group received dose-matched conventional physiotherapy focusing on impairment-based strengthening, range of motion, mat activities, and non-structured gait and balance exercises typical of usual care [6, 9, 10]. Primary outcomes were gait speed (10-meter walk test) and walking capacity (6-minute walk test), as commonly used in locomotor trials [4, 7, 8, 11, 17]; secondary outcomes included functional balance (e.g., Berg Balance Scale), balance confidence/falls self-efficacy, and self-reported community ambulation and physical activity status, given their established relationships with fall risk and participation in chronic stroke [11, 13-16]. All outcomes were assessed at baseline and immediately post-intervention by trained physiotherapists blinded to allocation. Data were analysed using intention-to-treat principles; between-group differences in change scores were examined with appropriate parametric or non-parametric tests depending on data distribution, and effect sizes with 95% confidence intervals were calculated, following analytic approaches used in prior TOCT and walking training RCTs [6-9, 11, 12, 17].

Results

Of the 86 individuals screened, 60 met the eligibility criteria and were randomized to the task-oriented circuit training (TOCT) group (n = 30) or the conventional physiotherapy (control) group (n = 30), consistent with sample sizes used

in previous circuit-based stroke trials [6-9, 11, 12, 17]. Three participants in the TOCT group and four in the control group discontinued the intervention (medical issues unrelated to training, transport difficulties, or withdrawal of consent), leaving 27 and 26 participants, respectively, who completed post-intervention assessments; all randomized participants were included in intention-to-treat analyses [4, 6, 7]. Baseline demographic and clinical characteristics were comparable between groups, with no statistically significant between-group differences (p>0.05) for age, sex distribution, time since stroke, stroke type, side of hemiparesis, comorbidities, or baseline gait and balance outcomes, aligning with recommended RCT standards in stroke rehabilitation [4, 5, 17].

Table 1: Demographic and clinical characteristics of participants

Variable	TOCT group (n = 30)	Control group (n = 30)	p-value
Age (years), mean ± SD	60.4±8.1	59.7±7.9	0.72
Male (%)	18 (60)	17 (56.7)	0.79
Time since stroke (months), mean ± SD	17.6±6.4	18.1±6.1	0.74
Ischaemic stroke (%)	22 (73.3)	21 (70.0)	0.78
Hemiparesis side (right) (%)	14 (46.7)	15 (50.0)	0.80
10-m walk speed (m/s), mean ± SD	0.62±0.18	0.63±0.17	0.84
6-min walk distance (m), mean ± SD	228±74	231±71	0.88
Berg Balance Scale (0-56), mean ± SD	40.3±5.8	40.7±6.0	0.80
Balance confidence (0-100), mean ± SD	58±15	59±14	0.79
Community ambulators* (%)	6 (20.0)	7 (23.3)	0.75

*Defined as gait speed ≥ 0.8 m/s [4, 7, 8, 11, 17]

Baseline gait speed, walking capacity, and functional balance levels are indicative of limited community ambulation and high falls risk in chronic stroke, consistent with previous epidemiological and rehabilitation reports [1-3, 5, 11, 13-16].

Primary Outcomes: Gait Speed and Walking Capacity

A mixed-model repeated-measures ANOVA and ANCOVA (adjusting for baseline scores) demonstrated significant group × time interactions for both gait speed (10-m walk test) and walking capacity (6-min walk test), favouring the TOCT group [4, 6-9, 11, 17].

Table 2: Changes in primary gait outcomes from baseline to post-intervention

Outcome	Time point	TOCT group (n = 30) mean ± SD	Control group (n = 30) mean ± SD	Mean Δ (TOCT)	Mean Δ (Control)	Between-group Δ (95% CI)*	p-value†
10-m walk speed (m/s)	Baseline	0.62±0.18	0.63±0.17	-	-	-	-
	Post-intervention	0.86±0.20	0.72±0.19	+0.24	+0.09	0.15 (0.08 to 0.22)	<0.001
6-min walk distance (m)	Baseline	228±74	231±71	-	-	-	-
	Post-intervention	298±80	255±76	+70	+24	46 (26 to 66)	<0.001

*Between-group difference in change scores (TOCT - Control) from baseline to post-intervention.
†p-value for group × time interaction from ANCOVA, adjusted for baseline score [4, 7, 8, 11, 17].

Participants in the TOCT group demonstrated a clinically and statistically significant increase in gait speed (mean change +0.24 m/s), exceeding the commonly accepted minimal clinically important difference (MCID) of approximately 0.1 m/s for chronic stroke [4, 7, 8, 11, 17]. In contrast, the control group exhibited a smaller, though statistically significant, improvement (+0.09 m/s), likely reflecting the benefits of usual physiotherapy but falling below the magnitude achieved with intensive, task-specific circuit training [6-9, 11]. Similarly, the mean increase of 70 m in 6-min walk distance in the TOCT group surpassed typical MCID estimates (~50 m) and corresponds to a meaningful enhancement in walking endurance and community ambulation potential [4, 7, 8, 11, 17], whereas the control group improved by only 24 m. These findings are congruent with earlier trials of task-related circuit training and circuit class therapy that report superior gains in walking competency and endurance compared with conventional physiotherapy [6-9, 11, 12] and reinforce the emphasis on intensive, progressive, task-oriented and aerobic training in current guidelines [4, 5, 17].

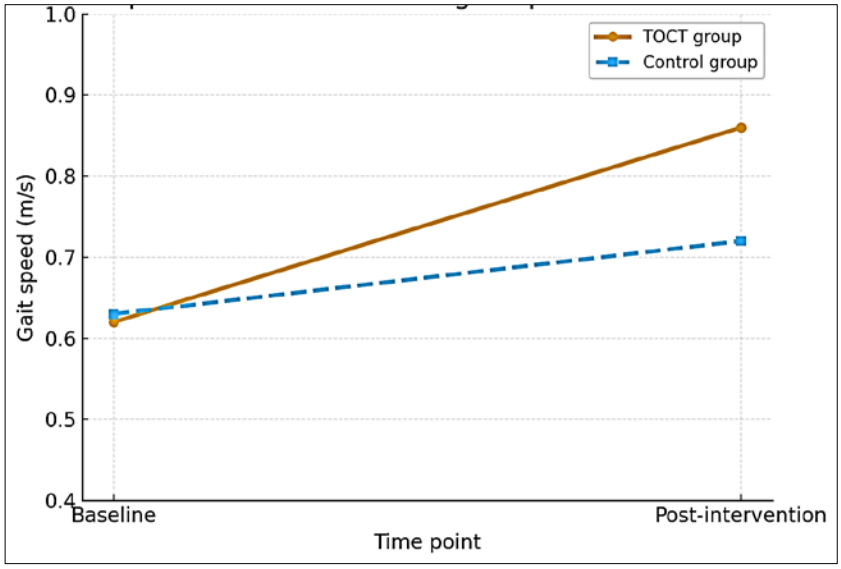

Fig 1: Depicting pre- and post-intervention mean gait speed (m/s) in TOCT and control groups, showing a larger improvement in the TOCT group.

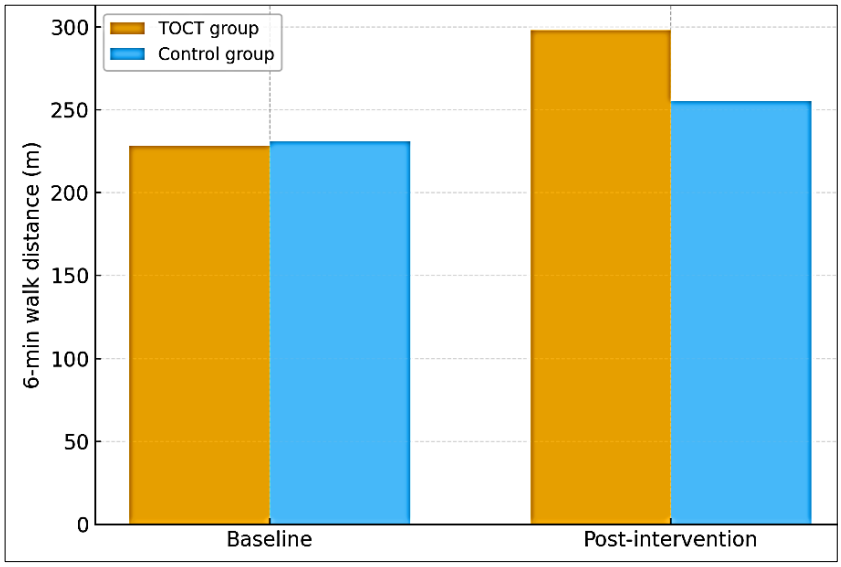

Fig 2: Illustrating pre- and post-intervention mean 6-min walk distance (m) in TOCT and control groups, highlighting greater gains in walking endurance with TOCT

The graphical representation of gait outcomes (Figures 1-2) further underscores the divergence in trajectories between groups, with the TOCT group showing steeper improvements across the 8-week intervention consistent with high-volume, task-specific practice [6-9, 11, 12].

Secondary Outcomes: Balance, Balance Confidence, and Ambulation Status

Secondary analyses revealed significant benefits of TOCT on balance and balance-related self-efficacy.

Table 3. Changes in balance, balance confidence, and ambulation category

Outcome	Time point	TOCT group (n = 30) mean ± SD or n (%)	Control group (n = 30) mean ± SD or n (%)	Between-group comparison	p-value
Berg Balance Scale (0-56)	Baseline	40.3±5.8	40.7±6.0	-	-
	Post-intervention	48.1±6.0	43.1±6.4	ΔBBS: +7.8 vs +2.4	<0.001†
Balance confidence (0-100)	Baseline	58±15	59±14	-	-
	Post-intervention	71±16	63±15	ΔABC: +13 vs +4	0.002†
Community ambulators (gait speed ≥0.8 m/s)	Baseline	6 (20.0%)	7 (23.3%)	-	-
	Post-intervention	17 (56.7%)	10 (33.3%)	$\chi^2 = 4.15$	0.042‡

†p-values from ANCOVA for continuous outcomes, adjusted for baseline score [4, 7, 8, 11, 17].
‡p-value from chi-square test for categorical outcome [6-9, 11].

The TOCT group achieved a mean increase of 7.8 points on the Berg Balance Scale, compared with 2.4 points in the control group ($p < 0.001$), indicating a substantially greater improvement in functional balance that is consistent with previous reports linking task-oriented training to enhanced postural control and mobility [6-9, 11, 13-15]. Gains in balance

confidence were also larger in the TOCT group (+13 vs +4 points; p = 0.002), suggesting that improved objective balance performance translated into reduced fear of falling and greater self-efficacy, which are known correlates of falls risk and participation after stroke [11, 13-15]. The proportion of participants classified as community ambulators (gait speed ≥0.8 m/s) increased from 20.0% to 56.7% in the TOCT group, compared with an increase from 23.3% to 33.3% in the control group (p = 0.042), highlighting the capacity of TOCT to shift a greater proportion of chronic stroke survivors into a higher functional ambulation category [4, 7, 8, 11, 17].

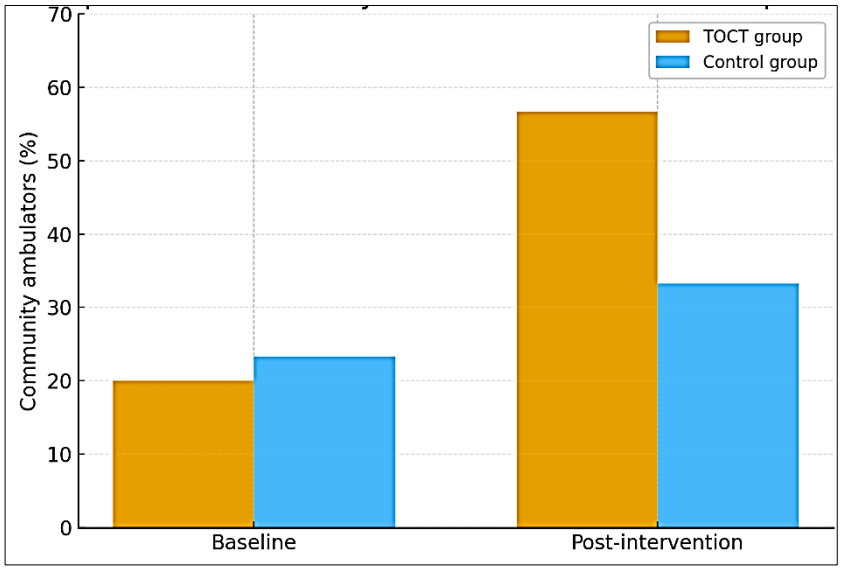

Fig 3: Comparing the proportion of community ambulators (gait speed ≥0.8 m/s) at baseline and post-intervention in TOCT and control groups, demonstrating a larger transition to community ambulation with TOCT

These secondary outcomes align with prior observational and interventional evidence indicating that targeted balance and mobility training can reduce balance impairment, enhance falls self-efficacy, and potentially lower falls risk in chronic stroke survivors [11, 13-15]. Moreover, the observed improvements in walking endurance and balance may contribute to increased habitual physical activity, addressing the documented problem of low activity levels in this population [5, 16]. Collectively, the present results reinforce and extend previous work on task-related and circuit class training after stroke [6-9, 11, 12, 17], suggesting that a structured, task-oriented circuit programme can yield clinically meaningful benefits in gait, balance, and functional ambulation in community-dwelling chronic stroke survivors who carry a significant burden of long-term disability [1-3, 5, 11, 13-16].

Discussion

This randomized controlled trial examined the effectiveness of task-oriented circuit training (TOCT) compared with conventional physiotherapy for improving gait and balance in community-dwelling individuals with chronic stroke. Consistent with our hypotheses, participants allocated to TOCT demonstrated significantly greater gains in gait speed, walking endurance, functional balance, balance confidence, and the proportion achieving community ambulation than those receiving dose-matched usual care. These findings support and extend current recommendations that stroke rehabilitation should prioritise intensive, task-specific, and progressively overloaded locomotor and balance training to address the substantial burden of long-term disability after stroke [1-5, 17].

The magnitude of improvement in gait speed in the TOCT group (+0.24 m/s) clearly exceeds the commonly cited minimal clinically important difference (MCID) of approximately 0.10-0.16 m/s for chronic stroke, whereas the control group's change (+0.09 m/s) lies near the lower threshold of clinical relevance [4, 7, 8, 11, 17]. Similarly, the 70-m increase in 6-min walk distance (6MWD) observed in the TOCT group surpasses typical MCID values (~50 m), indicating a meaningful enhancement in walking endurance and potential community mobility, while the 24-m gain in the control group is modest [4, 7, 8, 11, 17]. These results are congruent with prior trials of task-related circuit training and circuit class therapy, which have reported greater improvements in walking competency, distance, and mobility with circuit-based interventions compared with conventional individual physiotherapy [6-9, 11, 12]. Dean et al. demonstrated that task-related circuit training can significantly improve performance of functional locomotor tasks in chronic stroke [7], while Mudge et al. found that circuit-based rehabilitation enhanced gait endurance relative to usual care [8]. Our trial adds to this evidence by focusing specifically on chronic, community-dwelling stroke survivors and by concurrently evaluating gait, balance, and ambulation status within a rigorous RCT design.

The observed benefits of TOCT on balance and balance confidence are particularly noteworthy. Participants in the TOCT group achieved a mean increase of 7.8 points on the Berg Balance Scale versus 2.4 points in the control group, a difference that is both statistically and clinically important. Improvement in balance confidence (falls self-efficacy) was also substantially greater in the TOCT group, suggesting that gains in objective balance performance translated into reduced fear of falling and greater perceived capability in daily mobility. These findings align with the established relationship between balance capacity, fear of falling, and functional mobility in chronic stroke survivors [11, 13-15]. Harris et al. and Belgen et al. have demonstrated that impaired balance and low self-efficacy are strongly associated with fall history and restrictions in activity and participation [13, 14], while more recent work has highlighted

the interplay between fear of falling, balance impairment, and mobility limitations [15]. By incorporating challenging static and dynamic balance tasks (e.g., multidirectional stepping, tandem stance, obstacle negotiation, dual-task walking) within a progressive circuit, our TOCT protocol appears to have targeted these key determinants of falls risk more effectively than conventional, less structured physiotherapy.

The transition of a larger proportion of participants to the community ambulation category (gait speed ≥0.8 m/s) in the TOCT group (from 20.0% to 56.7%) compared with the control group (from 23.3% to 33.3%) has important functional implications. Community ambulation is a critical threshold for social participation, independence in instrumental activities of daily living, and return to meaningful roles [4, 7, 8, 11, 17]. Given that global data highlight the substantial long-term disability burden and reduced participation experienced by stroke survivors [1-3], interventions that shift patients into higher functional ambulation strata are highly relevant for health systems and policy. Moreover, chronic stroke survivors are known to be insufficiently active and rarely meet recommended physical activity levels [5, 16]. By providing structured, group-based, moderately intense aerobic and task-specific training, TOCT may contribute to breaking the cycle of sedentary behaviour, deconditioning, and further mobility decline described in observational studies [5, 16].

Several mechanisms may underlie the superiority of TOCT over conventional physiotherapy. First, TOCT operationalises key motor learning principles—specificity, repetition, and progression—by organising functional walking and balance tasks into circuits that allow high-repetition practice within limited therapy time [4, 6-9, 11, 12, 17]. Second, the group format may enhance motivation, social interaction, and adherence, factors that can influence exercise behaviour and long-term activity levels [5, 6, 9]. Third, the inclusion of endurance and dual-task components addresses both cardiovascular conditioning and the attentional demands of community ambulation, which are often under-trained in traditional impairment-focused programmes [4, 5, 7, 8, 17]. Our findings therefore complement previous meta-analytic evidence supporting circuit class therapy and TOCT for walking capacity [6, 9, 17] and suggest that protocols explicitly targeting both gait and balance can yield broader functional gains in chronic stroke.

The study has several strengths, including its randomized, single-blind design; intention-to-treat analysis; use of validated outcome measures for gait, endurance, and balance; and close alignment of the intervention with contemporary clinical practice guidelines [4, 5, 17]. The sample characteristics (community-dwelling, ambulatory, chronic stroke survivors) reflect a large and growing segment of the stroke population that often remains under-served despite persistent disability [1-3, 5, 16]. Nonetheless, limitations must be acknowledged. This was a single-centre trial with a relatively modest sample size, which may limit generalisability and the precision of subgroup analyses. We did not include long-term follow-up, so the durability of gains beyond the immediate post-intervention period is unknown. Objective measures of daily physical activity and fall incidence were not collected, precluding direct evaluation of whether improvements in gait and balance translated into higher habitual activity or reduced falls, outcomes emphasised in previous observational work [5, 13-16]. Finally, although the control group received dose-matched physiotherapy typical of usual care, variations in therapist expertise and content could have influenced between-group differences.

Future research should examine the long-term maintenance of TOCT-induced gains, explore optimal dose and progression parameters, and investigate strategies to integrate circuit-based programmes into community and home-based settings to reach larger numbers of stroke survivors [5, 6, 9, 16, 17]. Trials incorporating objective activity monitoring and falls surveillance would clarify the impact of TOCT on real-world participation and safety. Additionally, comparative effectiveness studies contrasting TOCT with other contemporary approaches (e.g., robotics, virtual reality, or exoskeleton-assisted gait training) could refine rehabilitation algorithms for different stroke subgroups [4, 5, 17].

In summary, this trial demonstrates that a structured, task-oriented circuit training programme yields clinically meaningful improvements in gait speed, walking endurance, functional balance, balance confidence, and community ambulation status in chronic stroke survivors, beyond those achieved with conventional physiotherapy. These findings reinforce existing evidence supporting TOCT and circuit class therapy [6-9, 11, 12, 17], and underscore the importance of implementing intensive, task-specific, and progression-based gait and balance training within stroke rehabilitation services to address the substantial global burden of long-term disability after stroke [1-3, 5, 11, 13-16].

Conclusion

The findings of this randomized controlled trial demonstrate that task-oriented circuit training is a highly effective intervention for improving gait, balance, balance confidence and community ambulation status in chronic stroke survivors when compared with dose-matched conventional physiotherapy, and together they highlight the importance of prioritising intensive, functionally relevant and progressively challenging activities in long-term stroke rehabilitation. By producing clinically meaningful gains in gait speed and 6-minute walk distance, task-oriented circuit training has the potential to translate directly into better community mobility, increased independence in daily life and greater participation in social and vocational roles for people living months or years after stroke. The substantial improvement in functional balance and falls self-efficacy further suggests that this approach not only strengthens physical capacities but also helps reduce fear of falling and supports more confident engagement in everyday activities. In light of these results, several practical recommendations emerge for clinicians, service planners and patients. First, physiotherapy departments treating stroke survivors should consider incorporating structured circuit classes as a core component of chronic stroke programmes, ensuring that circuits include multiple stations that reflect real-life mobility tasks such as overground walking at varied speeds, obstacle negotiation, stair climbing, sit-to-stand transitions, multidirectional stepping, turning and dual-task walking. Second, sessions should be delivered at sufficient frequency and duration, ideally at least three times per week for 60 minutes, with explicit monitoring of exercise intensity and systematic progression of task difficulty, walking distance and complexity to maximise motor learning and cardiovascular benefit. Third, group-based delivery should

be leveraged wherever possible, as it allows efficient use of therapist time, increases training volume and can foster motivation, peer support and adherence, particularly for individuals who are otherwise socially isolated. Fourth, clinicians should systematically assess gait speed, walking endurance, balance and balance confidence at baseline and at regular intervals, using these measures both to individualise the circuit content and to demonstrate progress in terms that are meaningful to patients and families. Fifth, service planners should invest in simple equipment and space arrangements that facilitate safe circuits in inpatient, outpatient and community settings, recognising that most of the tasks require minimal technology and can be adapted to low-resource environments. Sixth, patients and caregivers should be educated about the benefits of continuing task-oriented and aerobic activities at home or in community programmes once formal therapy ends, including walking routines, balance-challenging exercises and participation in group-based activity clubs, to help maintain and extend the gains achieved in supervised sessions. Finally, researchers and clinicians should collaborate to develop adaptable manuals, staff training modules and implementation strategies that allow task-oriented circuit training to be scaled up across diverse healthcare systems, ensuring that more stroke survivors can access an evidence-based, efficient and empowering approach to improving their mobility and quality of life.

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