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Original Article

Effect of Task-Oriented Motor Training on Lower Limb Functional Recovery in Post-Stroke Patients: A Randomized Controlled Trial

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ABSTRACT

Background: Lower limb dysfunction after stroke contributes substantially to impaired mobility, balance deficits, fall risk, and long-term dependence, particularly in settings where access to structured rehabilitation is limited. Task-oriented motor training is based on motor learning and neuroplasticity principles and may improve functional recovery through repetitive, goal-directed practice. Objective: To determine the effectiveness of task-oriented motor training on lower limb functional recovery in patients with sub-acute stroke. Methods: A single-blind randomized controlled trial was conducted at the Neurorehabilitation Department of a PIMS Teaching Hospital, Islamabad. A total of 102 participants with sub-acute stroke were randomized equally to task-oriented motor training or conventional physical therapy for six weeks, with sessions delivered for 45-60 minutes, five days per week. The primary outcome was lower extremity motor recovery measured by the Fugl-Meyer Assessment-Lower Extremity. Secondary outcomes included gait speed assessed by the 10-Meter Walk Test, balance assessed by the Berg Balance Scale, functional mobility assessed by the Timed Up and Go test, and activities of daily living assessed by the Barthel Index. Results: Ninety-five participants completed post-intervention assessment. Compared with conventional therapy, task-oriented motor training produced greater improvement in FMA-LE (+7.1 vs +4.0; p<0.001), 10MWT (+0.18 vs +0.09 m/s; p<0.001), Berg Balance Scale (+6.2 vs +3.7; p<0.001), Timed Up and Go (-4.5 vs -2.6 s; p=0.002), and Barthel Index (+14.2 vs +8.8; p=0.001). Between-group effect sizes ranged from 0.48 to 0.56. Conclusion: Task-oriented motor training significantly improved lower limb motor recovery, gait performance, balance, functional mobility, and daily living independence in sub-acute stroke patients and represents a practical rehabilitation strategy for resource-constrained settings. Keywords: stroke rehabilitation; task-oriented motor training; gait recovery; balance; functional mobility; activities of daily living; randomized controlled trial.

INTRODUCTION

Stroke remains one of the leading causes of long-term disability and functional dependence worldwide. Recent epidemiological evidence indicates that both the incidence of stroke and the associated disability

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burden continue to rise, particularly in low- and middle-income countries (LMICs), where access to timely rehabilitation remains limited and a substantial proportion of stroke-related disability-adjusted life years occurs (1,2). Among the most disabling consequences of stroke is lower limb motor impairment, which compromises gait, balance, mobility, independence, and community participation. During the acute stage, approximately 70–80% of stroke survivors experience lower limb motor deficits, and in many patients these limitations persist into the sub-acute and chronic phases, restricting functional recovery and increasing fall risk (3,4). Because gait performance and postural control are central determinants of independence after stroke, interventions targeting lower limb recovery remain a priority in neurorehabilitation (5).

Conventional rehabilitation commonly includes range-of-motion exercises, muscle strengthening, postural training, and basic gait practice. Although these approaches contribute to recovery, they may provide limited functional carryover when practice is not sufficiently specific to real-life motor tasks (6). Contemporary neurorehabilitation increasingly emphasizes motor learning and experience-dependent neuroplasticity, highlighting the importance of repetitive, goal-directed, and functionally meaningful practice for restoring movement after neurological injury (7). Task-oriented motor training (TOT) is based on these principles and involves repeated practice of functional activities such as sit-to-stand transitions, weight shifting, stepping, obstacle negotiation, gait training, and stair climbing. By focusing on purposeful movement patterns within relevant functional contexts, TOT is intended to improve motor control, postural stability, gait adaptability, and overall mobility (7,8).

Evidence from systematic reviews and randomized trials suggests that task-oriented approaches can improve gait speed, balance, and mobility in individuals after stroke, with meta-analytic findings showing modest but clinically relevant gains in locomotor performance and balance outcomes (5,9). However, most published evidence originates from higher-resource settings, whereas locally conducted randomized trials from LMIC rehabilitation contexts remain limited. This is an important gap because rehabilitation in LMICs often occurs under constraints related to staffing, infrastructure, equipment, and long-term access to therapy, which may influence the feasibility and effectiveness of structured task-specific interventions (2). Establishing evidence for low-cost, functionally relevant, and scalable rehabilitation strategies is therefore necessary to strengthen stroke care in such settings. In view of this gap, the present randomized controlled trial aimed to determine the effectiveness of task-oriented motor training on lower limb functional recovery in post-stroke patients by comparing its effects with those of conventional physical therapy on motor recovery, gait speed, balance, functional mobility, and activities of daily living.

MATERIALS AND METHODS

A single-blind, parallel-group randomized controlled trial was conducted at the Neurorehabilitation Department of a PIMS Teaching Hospital, Islamabad, Pakistan, to evaluate the effect of task-oriented motor training on lower limb functional recovery in patients with stroke. The intervention period lasted six weeks, and outcome assessment was performed at baseline and at the end of treatment. The trial compared a structured task-oriented motor training program with conventional physical therapy. Outcome assessment was performed by a physiotherapist who was blinded to group allocation.

Participants were recruited consecutively from the inpatient and outpatient neurology and rehabilitation services of the study site. Eligible participants were men and women aged 40 to 75 years with a first-ever ischemic or hemorrhagic stroke confirmed clinically and radiologically, who were in the sub-acute phase between one and six months after stroke onset, had mild to moderate lower limb motor impairment, were able to stand with minimal assistance, were medically stable, and were able to understand and follow verbal instructions. Patients were excluded if they had severe cognitive impairment indicated by a Mini-Mental State Examination score below 24, marked spasticity defined as a Modified Ashworth Scale score greater than 3, significant neurological, orthopedic, or cardiovascular comorbidities affecting gait, unstable medical condition, or severe perceptual or visual deficits interfering with safe participation in mobility training. Written informed consent was obtained from all participants before enrollment.

Sample size was estimated to be a priori using G*Power version 3.1.9.4. Based on an independent-samples comparison with an anticipated moderate effect size of 0.5, alpha of 0.05, and statistical power of 80%, the required sample was calculated as 102 participants, with 51 allocated to each group. After baseline assessment, eligible participants were randomized in a 1:1 ratio to either the task-oriented motor training group or the conventional physical therapy group using a computer-generated random allocation sequence. Allocation concealment was ensured through sealed, opaque, consecutively numbered envelopes prepared by an independent researcher not involved in recruitment, treatment, or assessment.

Both groups received supervised therapy sessions lasting 45 to 60 minutes, five days per week for six weeks. The intervention group received a structured task-oriented motor training program designed to improve lower limb motor control and functional mobility through repetitive, goal-directed, and progressively challenging practice. The program was grounded in motor learning and neuroplasticity principles and emphasized active participation, task specificity, repetition, graded progression, and functional relevance. Training activities included sit-to-stand practice, standing weight shifting, forward/lateral/backward stepping, obstacle negotiation, overground gait training, stair climbing, and dynamic balance exercises. Progression was individualized by reducing upper limb support, increasing repetitions and walking distance, modifying task complexity, introducing environmental challenges, and adding dual-task components when tolerated. The training was advanced across the six-week period from supported mobility tasks toward more demanding functional and community-oriented activities.

The control group received conventional physical therapy reflecting standard clinical practice at the study setting. This program included passive and active range-of-motion exercises, stretching of affected muscle groups, lower limb strengthening exercises, positioning and postural training, and basic gait training with assistive support where required. Session duration and treatment frequency were matched to the intervention group in order to reduce performance bias related to treatment exposure. All sessions in both groups were delivered by qualified physiotherapists, and attendance was monitored throughout the intervention period to support treatment fidelity and protocol adherence.

The primary outcome was lower extremity motor recovery, assessed using the Fugl-Meyer Assessment-Lower Extremity, a validated stroke-specific measure of motor impairment and voluntary movement control (9). Secondary outcomes included gait speed measured with the 10-Meter Walk Test, balance assessed using the Berg Balance Scale, functional mobility assessed with the Timed Up and Go test, and independence in activities of daily living assessed using the Barthel Index. These instruments are widely used in stroke rehabilitation and have established reliability, validity, and clinical utility for evaluating recovery of mobility and function after stroke (10-13). All outcome measures were recorded at baseline before randomization and repeated after completion of the six-week intervention by the blinded assessor using a standardized evaluation procedure.

Several steps were taken to reduce bias and improve data integrity. Random allocation with concealed sequence generation was used to limit selection bias, blinded outcome assessment was used to reduce detection bias, and equivalent treatment frequency and duration were maintained across groups to minimize performance-related imbalance. Standardized assessment procedures and predefined intervention protocols were followed throughout the study. Baseline demographic and clinical characteristics were recorded before treatment initiation to evaluate comparability between groups. Every randomized participant was retained in the primary analysis according to the intention-to-treat principle. Missing post-intervention values were handled using the last observation carried forward method.

Data were analyzed using SPSS version 27. Descriptive statistics were used to summarize baseline demographic and clinical characteristics as well as outcome measures. Continuous variables were presented as mean and standard deviation, and categorical variables as frequencies and percentages. Between-group comparisons were performed using independent-samples t-tests, while within-group pre-post changes were examined using paired-samples t-tests. Repeated-measures analysis of variance was used to assess the interaction between time and treatment group across the intervention period. Effect sizes were estimated using Cohen's d to support clinical interpretation of between-group differences. A p-value of less than 0.05 was considered statistically significant.

Ethical approval for the study was obtained from the relevant Institutional Review Board before participant recruitment. The study was conducted in accordance with accepted ethical principles for human research. Participant confidentiality was maintained throughout the study by restricting access to identifiable data and using study records only for research purposes. Participants were informed of their right to withdraw from the study at any point without any effect on their standard clinical care.

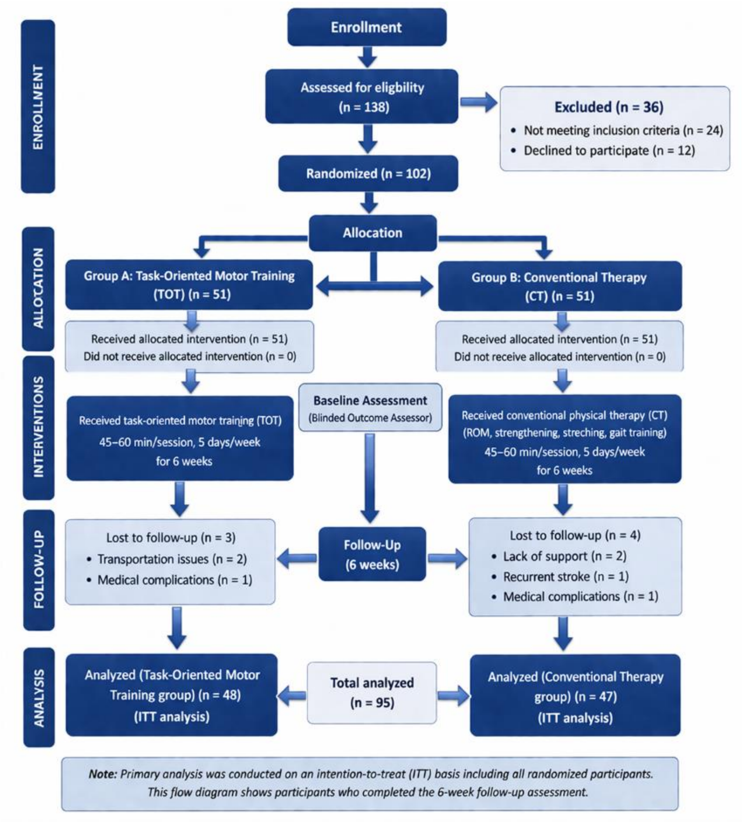

Figure 1 Consort Flowchart

RESULTS

A total of 138 patients were screened for eligibility, of whom 36 were excluded before randomization, including 24 who did not meet the eligibility criteria and 12 who declined participation or withdrew before allocation. The remaining 102 participants were randomized equally to the task-oriented training group and the conventional physical therapy group, with 51 participants in each arm. During follow-up, seven participants did not complete the intervention, including three from the task-oriented training group and four from the control group. Post-intervention assessment was therefore completed by 95 participants, including 48 in the task-oriented training group and 47 in the conventional therapy group. Baseline demographic and clinical characteristics were comparable between groups, with no statistically significant between-group differences across age, sex distribution, stroke type, time since stroke, affected side, cognitive status, spasticity, or baseline Barthel Index scores.

Lower limb motor recovery improved significantly in both groups after six weeks; however, the magnitude of improvement was greater in the task-oriented training group. Mean FMA-LE score increased from 18.9 ± 4.2 to 26.0 ± 4.6 in the intervention group, representing a mean gain of 7.1 points, whereas the control group improved from 19.1 ± 4.0 to 23.1 ± 4.3, a mean gain of 4.0 points. The between-group mean difference in change was 3.1 points (95% CI 1.9 to 4.3), with a statistically significant advantage for task-oriented training ($p < 0.001$) and a moderate effect size (Cohen's d = 0.56).

Gait speed improved in both groups, but the increase was more pronounced in the task-oriented training group. Mean 10MWT performance improved from 0.42 ± 0.11 m/s to 0.60 ± 0.13 m/s in the intervention arm, corresponding to a gain of 0.18 m/s, while the control group improved from 0.43 ± 0.12 m/s to 0.52 ± 0.12 m/s, a gain of 0.09 m/s. The between-group difference in mean change was 0.09 m/s (95% CI 0.06 to 0.12), which was statistically significant ($p < 0.001$) with a moderate effect size (d = 0.53). This pattern is clinically relevant because the relative improvement in gait speed was approximately 42.9% in the task-oriented training group compared with 20.9% in the control group.

Balance and functional mobility also favored task-oriented training. The mean Berg Balance Scale score increased by 6.2 points in the intervention group compared with 3.7 points in the control group, yielding a between-group difference in change of 2.5 points (95% CI 1.4 to 3.6; $p < 0.001$; d = 0.50). Timed Up and Go performance improved by a mean reduction of 4.5 seconds in the task-oriented training group versus 2.6 seconds in the control group, with a between-group difference in change of 1.9 seconds (95% CI 0.7 to 3.1; $p = 0.002$; d = 0.48). These findings indicate superior gains in dynamic balance, transitional mobility, and walking-related function among participants receiving the task-oriented protocol.

Independence in activities of daily living also improved to a greater extent in the intervention group. Mean Barthel Index score rose from 48.6 ± 9.3 to 62.8 ± 10.2 in the task-oriented training group, corresponding to a gain of 14.2 points, while the control group improved from 47.9 ± 8.8 to 56.7 ± 9.4, a gain of 8.8 points. The between-group difference in change was 5.4 points (95% CI 2.3 to 8.5), which remained statistically significant ($p = 0.001$) with a moderate effect size (d = 0.49). Overall, across all five functional outcomes, task-oriented training consistently produced larger absolute and relative improvements than conventional physical therapy.

Table 1. Baseline Demographic and Clinical Characteristics of Participants

Variable	Task-Oriented Training (n = 48)	Conventional Therapy (n = 47)	p-value
Age (years), mean ± SD	59.4 ± 8.7	60.1 ± 9.1	0.68
Male/Female, n	29 / 19	28 / 19	0.92
Ischemic Stroke, n (%)	34 (70.8)	34 (72.3)	0.84
Time Since Stroke (months), mean ± SD	3.2 ± 1.1	3.4 ± 1.2	0.47
Right-Sided Involvement, n (%)	27 (56.0)	25 (53.2)	0.77
MMSE Score, mean ± SD	26.8 ± 1.9	26.5 ± 2.1	0.41
Modified Ashworth Scale, mean ± SD	1.4 ± 0.6	1.5 ± 0.5	0.53
Barthel Index, mean ± SD	48.6 ± 9.3	47.9 ± 8.8	0.71

The baseline profile demonstrated strong comparability between groups. Mean age differed by only 0.7 years, ischemic stroke proportions differed by 1.5 percentage points, and time since stroke differed by 0.2 months. Baseline Barthel Index scores were also closely matched at 48.6 and 47.9, supporting the assumption that post-intervention differences are more likely attributable to treatment exposure than to major baseline imbalance.

Table 2. Six-Week Functional Outcomes and Between-Group Comparisons

Outcome	Group	Baseline Mean ± SD	Post 6 Weeks Mean ± SD	Mean Change	Between-Group Difference in Change	95% CI	p-value	Effect Size (Cohen's d)
FMA-LE (points)	Task-Oriented Training	18.9 ± 4.2	26.0 ± 4.6	+7.1	3.1	1.9 to 4.3	<0.001	0.56
	Conventional Therapy	19.1 ± 4.0	23.1 ± 4.3	+4.0				
10MWT (m/s)	Task-Oriented Training	0.42 ± 0.11	0.60 ± 0.13	+0.18	0.09	0.06 to 0.12	<0.001	0.53
	Conventional Therapy	0.43 ± 0.12	0.52 ± 0.12	+0.09				
Berg Balance Scale (points)	Task-Oriented Training	31.5 ± 6.8	37.7 ± 7.1	+6.2	2.5	1.4 to 3.6	<0.001	0.50
	Conventional Therapy	32.1 ± 6.4	35.8 ± 6.7	+3.7				
Timed Up and Go (sec)	Task-Oriented Training	24.8 ± 5.3	20.3 ± 4.9	−4.5	1.9	0.7 to 3.1	0.002	0.48

Outcome	Group	Baseline Mean ± SD	Post 6 Weeks Mean ± SD	Mean Change	Between-Group Difference in Change	95% CI	p-value	Effect Size (Cohen's d)
	Conventional Therapy	24.2 ± 5.6	21.6 ± 5.2	−2.6				
Barthel Index (points)	Task-Oriented Training	48.6 ± 9.3	62.8 ± 10.2	+14.2	5.4	2.3 to 8.5	0.001	0.49
	Conventional Therapy	47.9 ± 8.8	56.7 ± 9.4	+8.8				

This outcome table shows a consistent intervention advantage across all domains. The largest absolute gain was observed in the Barthel Index, where the intervention exceeded control by 5.4 points. For lower limb motor recovery, the intervention improved FMA-LE by 7.1 points compared with 4.0 points in controls, while gait speed improved by 0.18 m/s versus 0.09 m/s. Balance improved by 6.2 versus 3.7 points, and TUG time decreased by 4.5 versus 2.6 seconds. All between-group comparisons were statistically significant, and effect sizes ranged narrowly from 0.48 to 0.56, indicating a stable pattern of modest-to-moderate treatment benefit rather than a single isolated positive endpoint.

Table 3. Relative Improvement from Baseline Across Functional Outcomes

Outcome	Task-Oriented Training Relative Improvement (%)	Conventional Therapy Relative Improvement (%)	Absolute Advantage of Task-Oriented Training (%)
FMA-LE	37.6	20.9	16.7
10MWT	42.9	20.9	22.0
Berg Balance Scale	19.7	11.5	8.2
Timed Up and Go*	18.1	10.7	7.4
Barthel Index	29.2	18.4	10.8

*For Timed Up and Go, relative improvement reflects percentage reduction in time from baseline.

Relative change analysis further clarifies the clinical gradient of benefit. The greatest proportional treatment advantage was seen in gait speed, where the intervention produced a 42.9% improvement compared with 20.9% in controls, yielding an absolute advantage of 22.0 percentage points. Lower limb motor recovery also showed a marked relative gain of 37.6% versus 20.9%. Even outcomes with smaller proportional differences, such as TUG and BBS, still showed consistent intervention superiority, reinforcing that the effect of task-oriented training extended across impairment-level, activity-level, and participation-relevant measures.

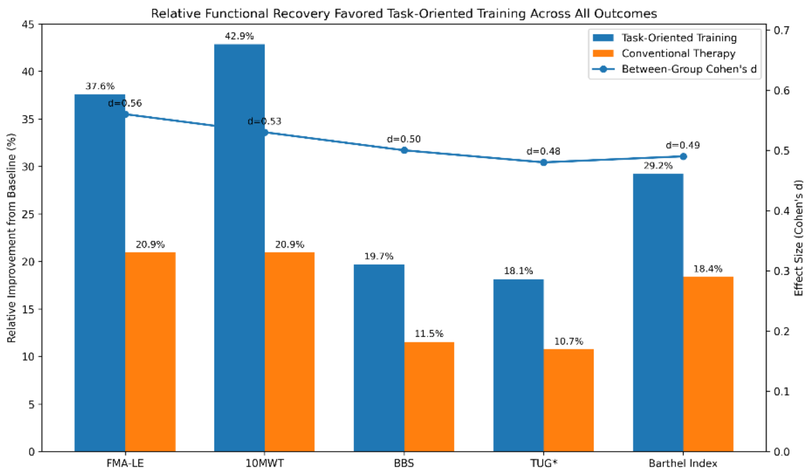

Figure 2 Relative Functional Recovery Favored Task-Oriented Training Across All Outcomes

This figure demonstrates that task-oriented training outperformed conventional therapy across every measured domain when outcomes were normalized to baseline performance. Relative improvement was greatest for gait speed (42.9% vs 20.9%) and FMA-LE motor recovery (37.6% vs 20.9%), while Barthel Index improvement remained substantial at 29.2% compared with 18.4% in controls. Balance and mobility outcomes also showed consistent superiority, with Berg Balance Scale improvement of 19.7% versus 11.5% and Timed Up and Go reduction of 18.1% versus 10.7%. The overlaid effect sizes remained closely clustered between d = 0.48 and d = 0.56, indicating that the intervention effect was moderate and stable across outcomes rather than being driven by a single endpoint.

DISCUSSION

This randomized controlled trial demonstrated that task-oriented motor training produced greater improvements than conventional physical therapy in lower limb motor recovery, gait speed, balance, functional mobility, and activities of daily living in patients with sub-acute stroke. The pattern of benefit was consistent across all measured outcomes, with between-group effect sizes ranging from 0.48 to 0.56, indicating modest-to-moderate but clinically meaningful treatment effects. The intervention group gained 7.1 points on the FMA-LE compared with 4.0 points in the control group, improved gait speed by 0.18 m/s compared with 0.09 m/s and achieved larger gains in both balance and Barthel Index scores. Rather than suggesting an isolated advantage in a single domain, these findings indicate that structured task-specific practice may support recovery across impairment-level and activity-level outcomes simultaneously, which is especially relevant in post-stroke rehabilitation where mobility limitations are multidimensional (5-9).

The greater improvement in lower extremity motor recovery observed in the intervention group is biologically plausible within current neurorehabilitation frameworks. Task-oriented training is based on repeated performance of meaningful, goal-directed actions that recruit motor planning, postural control, sensory feedback integration, and adaptive movement correction. Such practice is consistent with principles of experience-dependent neural plasticity, in which repetition, task salience, and active participation strengthen motor networks involved in functional recovery after brain injury (7). In the present study, the intervention emphasized sit-to-stand transitions, stepping, obstacle negotiation, gait practice, and dynamic balance activities rather than isolated movement components alone. This likely contributed to the larger FMA-LE gains by improving coordinated voluntary control in task-relevant contexts rather than only increasing strength or joint mobility.

The findings related to gait speed are particularly important from a clinical standpoint. Walking speed is widely regarded as a practical marker of functional mobility, ambulation capacity, and broader participation after stroke. The intervention group improved by 0.18 m/s, which was double the gain achieved in the control group and represented a relative improvement of 42.9% from baseline. This magnitude of change suggests more than statistical superiority alone; it indicates a potentially meaningful enhancement in walking function and community mobility potential. Because reduced gait speed is closely linked to dependency, fall risk, and restricted social participation after stroke, even moderate gains may translate into improved day-to-day function and confidence in real-world ambulation (4,10). The observed improvement is also directionally consistent with prior evidence showing that task-oriented and repetitive task-based interventions can improve locomotor performance more effectively than less functionally targeted therapy approaches (5,8).

The improvements in balance and Timed Up and Go performance further support the clinical value of the intervention. Balance recovery after stroke depends on the restoration of dynamic weight transfer, anticipatory postural adjustment, and coordinated stepping responses, all of which were directly trained in the task-oriented program. The intervention group improved by 6.2 points on the Berg Balance Scale compared with 3.7 points in controls, while TUG time decreased by 4.5 seconds compared with 2.6 seconds. These outcomes suggest superior gains in transitional movement control, dynamic stability, and safe mobility. Because post-stroke falls are a major cause of secondary morbidity, interventions that improve both gait and balance have practical importance beyond laboratory performance measures. The concurrent improvement across FMA-LE, BBS, and TUG suggests that the intervention may have enhanced movement quality as well as movement efficiency, rather than merely increasing task completion speed alone (4,5,11,12).

The greater increase in Barthel Index scores also deserves emphasis because it connects the intervention's motor effects to functional independence. The intervention group improved by 14.2 points compared with 8.8 points in the control group, indicating that gains in lower limb control and mobility were accompanied by better performance in activities of daily living. This pattern strengthens the clinical interpretation of the study because it demonstrates carryover from supervised training tasks to broader self-care and daily function. In rehabilitation research, improvements in impairment measures do not always translate into meaningful functional benefit; however, in the present study, better motor recovery and mobility were paralleled by improved independence, supporting the practical relevance of the intervention for patients and rehabilitation teams (13).

These findings align with prior literature emphasizing the value of task-specific and repetitive functional training after stroke. Systematic reviews and meta-analyses have reported beneficial effects of task-oriented and repetitive task training on gait outcomes, balance, and functional ability, although effect sizes have often been modest and influenced by protocol heterogeneity (5,8). The present trial extends that body of evidence by providing data from a structured six-week program delivered in a rehabilitation context representative of a resource-constrained setting. This is important because much of the published neurorehabilitation literature originates from higher-resource systems where staffing patterns, equipment access, and service intensity may differ substantially from LMIC environments. The present results therefore contribute contextually relevant evidence suggesting that meaningful functional gains can be achieved with a structured, progression-based program requiring limited equipment and grounded in clinically feasible activities (1,2,5).

At the same time, the findings should be interpreted with appropriate caution. Although the between-group effects were statistically significant and clinically encouraging, they remained in the modest-to-moderate range rather than indicating a large treatment effect. This suggests that task-oriented training should be viewed as an effective component of stroke rehabilitation rather than a complete substitute for comprehensive multidisciplinary care. The single-center design also limits the certainty with which these results can be generalized to other populations, care pathways, and service settings. In addition, the intervention lasted six weeks, so the durability of observed gains beyond the immediate post-treatment period remains unknown. Long-term follow-up is needed to determine whether advantages in gait, balance, and daily function are sustained, plateau, or require continued task-specific reinforcement over time. Several methodological factors also warrant consideration. Outcome assessment was blinded, random allocation and concealment procedures were used, and treatment exposure was matched across groups, all of which strengthen internal validity. However, therapist and participant blinding was not feasible because of the nature of the interventions, introducing the possibility of performance-related bias. Missing post-intervention data were addressed by last observation carried forward under the intention-to-treat framework, which reduces attrition-related distortion but may also underestimate or oversimplify true change in some participants. In addition, multiple functional outcomes were assessed, and although all favored the same direction of effect, future trials would benefit from prespecification of adjustment strategies for multiplicity and from reporting sensitivity analyses using alternative missing-data methods. These refinements would further strengthen confidence in the precision and robustness of treatment estimates.

From a practical standpoint, the intervention has attractive implementation characteristics. The task-oriented protocol relied on supervised, progressive, function-based activities such as sit-to-stand practice, stepping, gait training, obstacle negotiation, stair tasks, and balance challenges, all of which are relevant to routine rehabilitation practice and do not require advanced technology. This makes the program especially suitable for healthcare environments where rehabilitation resources are limited but stroke-related disability burden is high. Future multicenter trials should evaluate whether similar benefits are observed across broader stroke subgroups, different phases of recovery, and community-based or home-supported rehabilitation models. Studies incorporating longer follow-up, adherence tracking, and cost-effectiveness analysis would also help clarify how task-oriented training can best be integrated into scalable stroke rehabilitation pathways in lower-resource settings.

CONCLUSION

Task-oriented motor training was associated with significantly greater improvement than conventional physical therapy in lower limb motor recovery, gait speed, balance, functional mobility, and independence in activities of daily living among patients with sub-acute stroke. Although the observed treatment effects were modest to moderate, they were consistent across all major outcomes and support the clinical value of structured, repetitive, goal-directed functional training within stroke rehabilitation. These findings suggest that task-oriented motor training is a practical and effective strategy for improving post-stroke mobility and functional recovery, particularly in rehabilitation settings where low-cost, scalable, and clinically meaningful interventions are needed.

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