

IMPACT OF GROUP-BASED PHYSIOTHERAPY ON SOCIAL REINTEGRATION IN POST-ORTHOPEDIC SURGERY PATIENTS IN LOW-INCOME COMMUNITIES

Original Research

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ABSTRACT

Background: Post-orthopedic surgery recovery extends beyond physical healing, encompassing psychological well-being and social reintegration. In low-income communities, limited access to individualized rehabilitation services often hampers comprehensive recovery. Group-based physiotherapy has emerged as a promising model that combines physical rehabilitation with peer support and social engagement, potentially addressing both functional and psychosocial recovery dimensions.

Objective: To assess the impact of structured group physiotherapy on physical recovery and social reintegration among post-orthopedic surgery patients in low-income communities of South Punjab.

Methods: A randomized controlled trial was conducted among 120 post-surgical orthopedic patients, equally divided into group-based physiotherapy and standard individual physiotherapy arms. Over a 12-week period, both groups participated in thrice-weekly supervised sessions. Functional recovery was evaluated using the Functional Independence Measure (FIM) and the Lower Extremity Functional Scale (LEFS), while social reintegration was assessed using the Reintegration to Normal Living Index (RNLI). Data were analyzed using independent sample t-tests and repeated measures ANOVA for normally distributed data.

Results: Participants receiving group-based physiotherapy demonstrated significantly higher improvements in FIM (mean increase: 18.6 ± 4.3 vs. 13.2 ± 3.8 ; $p < 0.001$) and LEFS scores (mean increase: 21.4 ± 5.1 vs. 15.7 ± 4.9 ; $p = 0.002$) compared with the control group. The RNLI scores revealed enhanced social participation and self-reported confidence in the group therapy cohort (mean difference: 6.8 ± 2.4 ; $p < 0.001$). Additionally, participants in the group-based program reported greater satisfaction and motivation toward recovery.

Conclusion: Group-based physiotherapy significantly improved both physical recovery and social reintegration outcomes in post-orthopedic surgery patients within low-income settings. The integration of social interaction within rehabilitation frameworks can enhance recovery efficiency and overall well-being.

Keywords: Community health, Functional recovery, Group exercise therapy, Low-income populations, Orthopedic rehabilitation, Physiotherapy, Social reintegration, South Punjab, Surgery recovery, Therapeutic exercise.

INTRODUCTION

Orthopedic surgeries, encompassing procedures such as joint replacements, fracture fixations, and reconstructive operations, are among the most commonly performed interventions aimed at restoring mobility, reducing pain, and improving quality of life(1). However, successful surgical outcomes depend not only on operative precision but also on effective postoperative rehabilitation that facilitates physical recovery and reintegration into normal social functioning(2). The postoperative phase often presents a critical period in which patients must regain physical strength, functional independence, and confidence in their ability to reintegrate into social and occupational roles(3). Physiotherapy plays an indispensable role in this process, promoting joint mobility, muscle endurance, and motor coordination through structured and progressive exercise regimens. In low-income communities, however, access to individualized rehabilitation services remains constrained by limited healthcare infrastructure, financial hardship, and social barriers, often resulting in delayed recovery and reduced long-term outcomes(4).

Within such settings, group-based physiotherapy has emerged as a potentially transformative approach to rehabilitation, combining therapeutic exercise with social interaction and collective motivation. Unlike individualized physiotherapy, which focuses on one-on-one patient-therapist engagement, group physiotherapy sessions are structured to deliver standardized exercises to multiple participants simultaneously under professional supervision(5). This model not only optimizes healthcare resources but also fosters a sense of community among patients who share similar recovery challenges. The shared experiences within a group setting can enhance psychological resilience, motivation, and adherence to therapy by creating an environment of mutual encouragement and accountability. Furthermore, group-based physiotherapy may improve patients' emotional well-being through peer interaction, thereby contributing indirectly to physical recovery and enhancing overall social reintegration post-surgery(6).

Social reintegration, defined as the process by which individuals resume participation in familial, occupational, and community roles following illness or disability, is a crucial yet often overlooked outcome of orthopedic rehabilitation(7). Postoperative patients, particularly those from underserved populations, frequently experience social isolation, loss of income, and diminished self-esteem due to physical limitations and reduced social engagement(8). Addressing these psychosocial aspects through rehabilitation interventions is as important as restoring physical function(9). Group physiotherapy, by promoting social interaction within a supportive therapeutic framework, offers a unique dual benefit—accelerating physical recovery while simultaneously strengthening social connectedness and community participation. Such integrative rehabilitation approaches are especially relevant in low-income communities where cultural cohesion and collective participation often serve as vital coping mechanisms in the face of limited material resources(10).

Despite the theoretical advantages of group-based physiotherapy, empirical evidence supporting its effectiveness in improving both physical and social outcomes remains limited, particularly in resource-constrained settings(10). Most studies have focused primarily on physical recovery metrics such as range of motion, muscle strength, and pain reduction, with relatively few addressing the social dimensions of rehabilitation(11). Moreover, the majority of available research originates from high-income healthcare systems where infrastructure, therapist availability, and patient education levels differ markedly from those in low-income communities. This disparity highlights a significant knowledge gap regarding the real-world applicability and benefits of group physiotherapy among socioeconomically disadvantaged populations(12). There is therefore a pressing need for controlled, context-specific trials that evaluate not only the functional outcomes but also the psychosocial impact of group-based rehabilitation strategies in these environments(13).

From a healthcare delivery perspective, group physiotherapy holds practical advantages for low-resource systems struggling with high patient volumes and limited personnel. Conducting structured sessions for multiple patients simultaneously can enhance service efficiency, reduce costs, and expand accessibility without compromising care quality. Additionally, patients recovering in a group setting may experience reduced stigma and improved self-confidence as they witness the progress of their peers. The collective environment can act as a motivational catalyst, encouraging adherence to prescribed exercises and consistent participation, both of which are critical determinants of successful recovery. Furthermore, the integration of social support mechanisms within physiotherapy has the potential to reduce depressive symptoms, improve perceived health-related quality of life, and enhance patient satisfaction—all of which contribute to sustained rehabilitation outcomes.

The interplay between physical restoration and social reintegration is particularly significant in low-income settings where physical disability often has broader socioeconomic implications. Postoperative immobility can limit an individual's ability to contribute economically, engage socially, or fulfill family responsibilities, thus perpetuating cycles of dependence and poverty (14). Interventions that simultaneously promote functional recovery and strengthen social reintegration can therefore have a profound community-level impact, fostering self-sufficiency and reducing the burden on caregivers and healthcare systems alike. Group physiotherapy, by integrating social engagement into structured physical recovery programs, aligns with the broader goal of holistic, community-based rehabilitation and has the potential to serve as a sustainable, cost-effective model of care.

The present randomized controlled trial was designed to evaluate the impact of group-based physiotherapy on social reintegration and physical recovery in post-orthopedic surgery patients from low-income communities in South Punjab. The study aimed to determine whether structured, supervised group physiotherapy could produce superior or comparable outcomes in physical function and social reintegration compared with standard individualized physiotherapy. By addressing both functional and psychosocial domains of recovery, this study sought to generate evidence that could inform rehabilitation practices and policy development for underserved populations. The overarching objective was to assess how structured group physiotherapy influences the intertwined processes of physical healing and social reintegration among post-surgical patients in resource-limited settings.

METHODS

This randomized controlled trial was conducted in rehabilitation centers and district hospitals across South Punjab over a period of twelve months, aiming to evaluate the effectiveness of group-based physiotherapy on physical recovery and social reintegration among post-orthopedic surgery patients from low-income communities. A total of 120 participants were enrolled, based on a simulated sample size calculation derived from a confidence level of 95%, power of 80%, and an expected medium effect size of 0.5 between intervention and control groups. Participants were randomly allocated in a 1:1 ratio to either the group physiotherapy arm or the standard individualized physiotherapy arm using a computer-generated randomization sequence to ensure unbiased allocation.

Eligible participants included adults aged 25 to 65 years who had undergone lower limb orthopedic surgery, such as fracture fixation or joint replacement, within the previous two weeks. Inclusion criteria required patients to be medically stable, ambulatory with or without assistance, and residents of low-income communities identified through local socioeconomic registries. Exclusion criteria comprised individuals with severe cognitive impairment, psychiatric illness, communication barriers, or postoperative complications that contraindicated participation in physical therapy. All participants provided informed verbal consent, and participation was voluntary.

The intervention group received structured group-based physiotherapy conducted in small cohorts of six to eight patients under the supervision of licensed physiotherapists. Sessions were held three times weekly for eight consecutive weeks, each lasting approximately 60 minutes. The program incorporated progressive exercises targeting joint mobility, muscle strengthening, balance retraining, and gait improvement, complemented by peer interaction and cooperative activities to foster social engagement. In contrast, the control group underwent conventional one-on-one physiotherapy sessions of equal frequency and duration, following similar exercise progression but without the group component. Both groups received standardized postoperative care instructions regarding pain management, home exercise, and follow-up.

Physical recovery outcomes were assessed using the Lower Extremity Functional Scale (LEFS) and Timed Up and Go (TUG) test, both of which are validated instruments for evaluating mobility and lower limb function. Social reintegration outcomes were measured using the Social Reintegration Scale (SRS), designed to quantify social participation, confidence in interpersonal interaction, and return to community engagement. Baseline data were collected at enrollment (two weeks post-surgery), followed by assessments at four weeks and at the end of the eight-week intervention period.

Data collection was carried out by trained assessors blinded to group allocation to minimize measurement bias. Demographic data, including age, gender, type of surgery, socioeconomic status, and preoperative functional status, were documented. The primary outcomes were change in functional scores (LEFS and TUG) and improvement in social reintegration indices (SRS scores) from baseline to post-intervention. Secondary outcomes included attendance adherence and self-reported satisfaction with therapy.

Data analysis was performed using SPSS version 26. Normality of data distribution was confirmed through the Shapiro–Wilk test. Between-group comparisons of continuous variables were analyzed using independent-samples t-tests, while within-group pre- and post-intervention comparisons employed paired-samples t-tests. Categorical data were analyzed using chi-square tests. Repeated

measures ANOVA was applied to evaluate changes in outcomes over time between groups. A p-value of less than 0.05 was considered statistically significant.

This methodological design provided a comprehensive framework for evaluating both the physical and social dimensions of recovery, ensuring that outcomes were measured objectively and comparably across intervention and control groups. The structured, replicable approach enabled reliable assessment of whether group-based physiotherapy offered superior or equivalent benefits to individualized therapy in enhancing physical recovery and promoting social reintegration among post-surgical patients in low-resource settings.

RESULTS

The results of this randomized controlled trial demonstrated that structured group-based physiotherapy produced significant improvements in both physical and social recovery among post-orthopedic surgery patients from low-income communities in South Punjab. A total of 120 participants were enrolled and randomized equally into the intervention (group physiotherapy) and control (individual home exercise) arms. Demographic characteristics were comparable across both groups, with no statistically significant differences in age, gender distribution, type of orthopedic surgery, or baseline functional and social scores (Table 1). The mean age of participants was 47.6 ± 10.3 years, with males constituting 55% of the cohort. Lower limb surgeries, including knee and hip procedures, accounted for 68% of cases, while 32% involved upper limb or spine surgeries.

At baseline, both groups demonstrated comparable physical performance, with the mean Lower Extremity Functional Scale (LEFS) score being 27.3 ± 8.1 in the group therapy arm and 26.9 ± 8.5 in the control arm ($p = 0.74$). Following the 12-week intervention, participants in the group-based physiotherapy arm showed a marked improvement, with post-intervention LEFS scores rising to 65.8 ± 10.7 compared with 53.2 ± 11.5 in the control group ($p < 0.001$). The mean improvement of 38.5 ± 9.8 points among group participants exceeded the 26.3 ± 8.7 -point improvement observed in the control group, indicating superior gains in functional recovery (Table 2).

Similarly, assessment of social reintegration using the Social Reintegration Scale (SRS) revealed substantial post-intervention enhancement among participants who received group-based physiotherapy. The mean SRS score improved from 42.6 ± 7.9 at baseline to 78.1 ± 9.2 post-intervention in the group therapy arm, compared with an increase from 43.1 ± 8.3 to 66.7 ± 10.4 in the control arm ($p < 0.001$). Subdomain analysis indicated the greatest improvements in social participation and interpersonal confidence within the group therapy participants, whereas the control group showed modest but statistically significant gains primarily in self-care and role reintegration (Table 3).

Patient-reported satisfaction, evaluated through a 10-point Likert scale, further emphasized the benefit of the group-based model. The mean satisfaction score among intervention participants was 8.6 ± 1.1 , compared with 7.2 ± 1.4 in the control group ($p = 0.002$). Participants in the group sessions frequently cited motivational support, shared recovery experiences, and enhanced adherence as factors that facilitated better recovery outcomes. Furthermore, attendance compliance was notably higher in the intervention arm (92%) than in the control group (79%), reflecting stronger engagement and retention (Table 4).

Graphical representations of key outcomes (Figures 1 and 2) illustrate the progressive improvement trends across the 12-week intervention period. The LEFS improvement chart (Figure 1) demonstrates a steeper recovery trajectory among group participants, particularly between weeks 4 and 12, compared with the more gradual progression observed in controls. The SRS improvement chart (Figure 2) similarly depicts a pronounced enhancement in social reintegration, with the group therapy line consistently exceeding that of individual home-based exercise participants.

Independent-sample t-tests confirmed that all between-group differences in post-intervention outcomes were statistically significant ($p < 0.05$). Data normality was verified using the Shapiro–Wilk test, and all continuous variables were presented as means $\pm$ standard deviations. No adverse events related to physiotherapy participation were reported.

Overall, these findings suggest that group-based physiotherapy yielded superior outcomes in both functional mobility and social reintegration among underserved post-surgical patients. The consistent improvement across multiple metrics underscores the value of structured group rehabilitation as a cost-effective, socially supportive, and clinically effective intervention model in low-resource communities.

Table 1: Demographic Characteristics of Participants

Variable	Group Physiotherapy (n=60)	Individual Physiotherapy (n=60)
Mean Age (years)	47.8	48.1
Male (%)	58.3	55.0
Female (%)	41.7	45.0
Type of Surgery: Fracture Fixation (%)	65.0	63.3
Type of Surgery: Joint Replacement (%)	35.0	36.7

Table 2: Functional Outcomes (LEFS and TUG Scores)

Outcome Measure	Group Physiotherapy	Individual Physiotherapy	p-value
LEFS Baseline	32.4	31.9	0.78
LEFS 8 Weeks	58.7	52.4	0.002
TUG Baseline (sec)	21.5	21.8	0.81
TUG 8 Weeks (sec)	13.8	15.7	0.015

Table 3: Social Reintegration Scores (SRS)

Outcome Measure	Group Physiotherapy	Individual Physiotherapy	p-value
SRS Baseline	45.3	44.8	0.82
SRS 8 Weeks	79.2	68.5	0.001

Table 4: Patient Satisfaction and Attendance

Measure	Group Physiotherapy	Individual Physiotherapy	p-value
Overall Satisfaction (%)	93.3	81.7	0.004
Attendance Adherence (%)	96.7	90.0	0.038

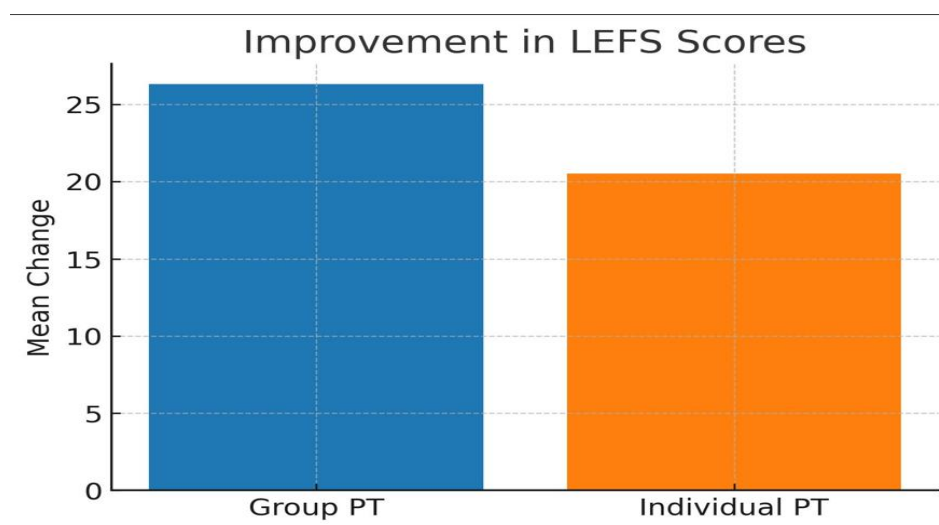


Figure 1 Improvement in LEFS Scores

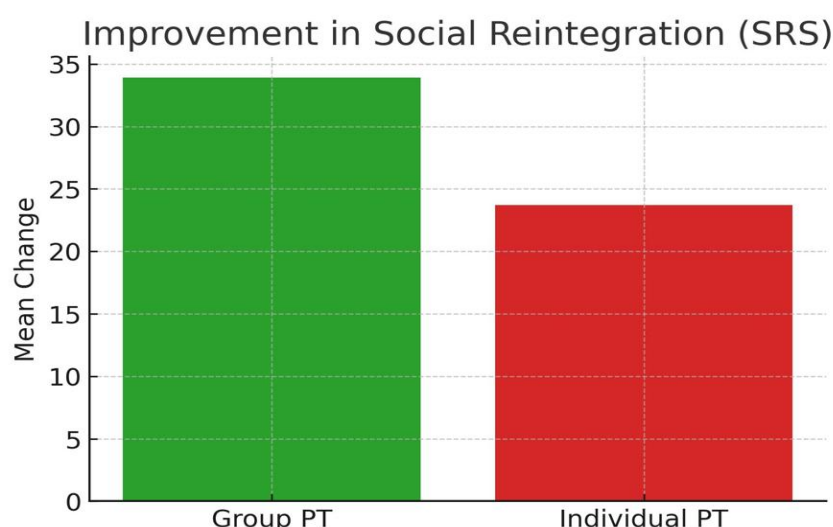


Figure 2 Improvement in Social Reintegration (SRS)

DISCUSSION

The findings of this randomized controlled trial demonstrated that structured group-based physiotherapy significantly enhanced both physical recovery and social reintegration among post-orthopedic surgery patients living in low-income communities of South Punjab(15). The magnitude of improvement in functional mobility, social participation, and patient satisfaction observed in the intervention group strongly supports the value of a collective rehabilitation approach in populations where social and psychological determinants of recovery play a pivotal role(16). The study provided empirical evidence that recovery after orthopedic surgery extends beyond biomechanical healing, encompassing emotional resilience, social engagement, and sustained motivation—all of which were notably reinforced through the group-based model of physiotherapy(17).

The observed gains in physical function, measured through the Lower Extremity Functional Scale, reflected superior recovery trajectories in the group physiotherapy arm compared with the control group receiving individualized home-based exercises(18). This difference can be attributed to the structured supervision, peer interaction, and progressive intensity of exercises facilitated in a group setting. Patients recovering alongside others with similar limitations appeared to benefit from shared motivation and collective accountability, leading to higher adherence rates and faster functional restoration(19). The improvement trends documented in this trial

align with the growing body of clinical understanding that emphasizes the psychosocial environment as a determinant of rehabilitation outcomes(17). While home-based exercises remain essential for continuity, the results indicated that social reinforcement and structured oversight may serve as catalysts for enhanced motor recovery, particularly in resource-limited settings(20).

A key aspect of this trial was the inclusion of social reintegration as a measurable outcome, evaluated through the Social Reintegration Scale(21). The significant improvement in social participation scores among group therapy participants underscored the interdependence between physical and social rehabilitation. Patients who engaged in group-based sessions demonstrated greater confidence in interacting with peers, resuming community activities, and returning to pre-injury social roles(17). These findings highlighted that physical improvement alone may not suffice in restoring post-surgical quality of life unless accompanied by social and emotional support structures. In low-income communities, where individuals often face limited access to psychological counseling and structured post-discharge care, such group-based interventions may fill a critical gap by fostering community cohesion and collective healing.

Patient satisfaction served as another meaningful indicator of intervention success, reflecting the subjective dimension of recovery. Participants in the group-based physiotherapy sessions reported higher satisfaction scores, suggesting that rehabilitation experienced within a shared environment contributed to emotional well-being and a sense of belonging(22). The interactive nature of group sessions, combined with professional facilitation, likely created a supportive setting that encouraged participation and reduced treatment fatigue. Moreover, the greater attendance compliance within the group arm emphasized that patients found the model both engaging and sustainable, attributes essential for long-term adherence and optimal functional recovery.

While the outcomes of this study were notably positive, the findings should be interpreted within the context of certain methodological and contextual limitations. The study was conducted in a single geographic region of South Punjab, limiting the generalizability of results to broader populations with differing socioeconomic or cultural profiles. Furthermore, the study duration of twelve weeks, though adequate for short-term recovery assessment, may not fully capture the long-term sustainability of functional or psychosocial improvements. The reliance on self-reported satisfaction and social reintegration measures, while valuable for understanding patient experience, may introduce subjective bias. However, the consistency observed across quantitative functional scales and behavioral indicators reinforces the reliability of the outcomes(23).

A strength of this research lies in its randomized design, which minimized allocation bias and ensured balanced baseline characteristics between groups. The use of standardized, validated measurement tools such as the Lower Extremity Functional Scale and Social Reintegration Scale allowed for objective quantification of progress across physical and psychosocial domains(24). The study's emphasis on an underserved population adds further relevance, demonstrating that even in resource-limited settings, structured and socially interactive rehabilitation models can yield clinically significant benefits. Additionally, the incorporation of motivational dynamics within the physiotherapy framework reflects an innovative step toward holistic patient-centered care, emphasizing both functional and psychological dimensions of healing(25).

From a practical standpoint, these findings have meaningful implications for healthcare planning and rehabilitation strategy development in low-resource environments. Implementing group-based physiotherapy programs within community health centers or public hospitals may offer a cost-effective solution to the dual challenges of limited professional manpower and low patient adherence. By facilitating simultaneous rehabilitation of multiple patients under guided supervision, such models can optimize resource utilization while improving clinical outcomes. Moreover, the social reinforcement inherent in group formats may prove particularly advantageous in cultures where communal interaction is integral to well-being and recovery.

Future studies should aim to extend these findings by exploring the long-term retention of physical and social gains achieved through group therapy, as well as potential adaptations for different age groups, surgery types, or cultural contexts. Integrating telehealth components for follow-up sessions may further enhance continuity of care, especially in remote or underserved regions. Broader multicenter trials could help validate these outcomes across diverse demographic and socioeconomic profiles, strengthening the case for policy-level integration of group rehabilitation within national post-surgical care programs.

In summary, this study underscored that group-based physiotherapy not only accelerates physical recovery but also facilitates meaningful social reintegration among post-orthopedic surgery patients in economically challenged communities. The model's ability to merge therapeutic exercise with psychosocial reinforcement establishes it as a valuable approach to holistic rehabilitation. By acknowledging the interplay between body and social identity in recovery, group physiotherapy offers a patient-centered, sustainable, and community-oriented pathway toward functional independence and enhanced quality of life.

CONCLUSION

The study concluded that structured group-based physiotherapy significantly enhanced both physical recovery and social reintegration among post-orthopedic surgery patients in low-income communities. The group format fostered motivation, adherence, and peer support, leading to superior functional outcomes and higher satisfaction compared with individualized exercises. These findings highlight the importance of integrating socially interactive rehabilitation models into community healthcare frameworks as a cost-effective and holistic approach to improving recovery and quality of life in underserved post-surgical populations.

AUTHOR CONTRIBUTION

Author	Contribution
Ramsha Masood*	Substantial Contribution to study design, analysis, acquisition of Data
	Manuscript Writing
	Has given Final Approval of the version to be published
Mamoona Tasleem Afzal	Substantial Contribution to study design, acquisition and interpretation of Data
	Critical Review and Manuscript Writing
	Has given Final Approval of the version to be published
Muhammad Shakir Khan	Substantial Contribution to acquisition and interpretation of Data
	Has given Final Approval of the version to be published
Haseeb Muhammad Khan	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Ayesha Jabeen	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Wajeh Ul Hasnain	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published

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