Original Article

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Effectiveness of Community Based Group Therapy for Chronic Low Back Pain in Older Women in Bangladesh: A Randomised Controlled Trial

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Abstract:

Objective: Group therapy involves multiple people being treated by one or more health professionals. It can cure physical and psychological conditions; such as attention-deficit/hyperactivity disorder (ADHD), emotional trauma, anxiety, despair, and post-traumatic stress disorder (PTSD). This study investigates whether community-based group therapy helps older women with chronic low back pain.

Material and Methods: The study was a randomized controlled trial, with 40 patients divided into control and intervention groups. The control group received conventional treatment in an institute-based rehabilitation (IBR) facility, while the intervention group received the same exercise program in a community-based rehabilitation (CBR) setting. Both groups received supervised 30-minute sessions five days a week for eight weeks. The numeric pain rating scale (NPRS) was used to measure the severity of pain and the Roland-Morris Disability Questionnaire (RMDQ) measured physical disability due to low back pain in older women.

Results: The average age of the participants was 56 (53 to 58.50). The BMI findings were 7.5% (n=3) of participants being underweight and 45% (n=18) of participants being overweight. In terms of pain and physical disability due to low back pain, the CBR group showed significant improvement (p-value<0.05) in cases of both inter- and intra-group comparison using the IBR treatment facility.

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Conclusion: Group therapy treatment reduces low back pain and prevents the severity of back pain in older women, thereby improving their quality of life. This study shows that group-based physical therapy helps relieve chronic low back pain. Strengthening, stretching, and flexion exercises in groups improve quality of life and minimise discomfort.

Keywords: community based rehabilitation, low back pain, older women, pain & disability

Introduction

Chronic low back pain (CLBP) is a pain that perseveres for more than 3 months than the desired recovery period. It is one of the most common and expensive musculoskeletal problems in the modern era[1]. It has been documented that approximately 65 to 85% of older people suffer from musculoskeletal pain, and about 70–80% of adults experience CLBP occasionally in their lives[2,3]. Due to increasing healthcare-related expenditures resulting from LBP, it is becoming more of a burden in developed nations as well as countries with low or middle incomes[4]. There has been a substantial 54% rise in LBP since 1990, with the most pronounced increase occurring in low-income and middle-income countries (LMICs). In addition, disability resulting from lower back pain (LBP) has become a significant issue in these countries (LMICs); particularly in Bangladesh[5].

In many cases, it was shown that older women are more affected by CLBP than older men. The main causes of more CLBP in females consist of female hypertension, joint pain, pre-existing LBP, and loneliness, which were predictors for devolving persistent LBP in individuals aged 70 years[6]. The context of the prevalence of back pain in general should be placed in the ubiquity of chronic back pain. Many studies regarding this pain have shown society's high frequency of back complaints. In 2005, the US spent more than one hundred billion dollars on LBP-related medical care, and as the prevalence of back pain increases, consequently so will these costs[7]. Prevalence in the 18–34 age group has raised gradually from 10.5% (95% confidence interval (CI): 5.7% to 15.4%), and to 27.8% (95% CI: 16.1% to 39.5%) in the 55–99 age group. Although women are more likely to demonstrate this tendency, there are no significant distinctions in prevalence between occupational groups[8]. Back pain appears in 15% to 45% of individuals annually, with an average point frequency of 30%. In the United States, back pain ranks fifth in the number of hospitalisations, is the second most common reason for seeing a physician, is the most common reason for activity limitation for individuals under 45, and is the third most common reason for surgical operations[2-4]. Each year, back injuries make compensation claims for about 2% of the US workforce. Among farmers in rural areas, low back pain (LBP) is the most widespread musculoskeletal circumstance[9].

In developed nations, 47% of farmers in Sweden had LBP one year prior to the study[10]. In the US, the prevalence is 37%, while in Finland it is 23%. However, the rate is significantly higher in developing nations. For instance, in China, the prevalence is 64%[11] and in South West Nigeria, it is 72%. Differences in the study populations, the relative abundance of individuals, being psychological in nature as well as physiological risk factors for LBP may be the causes of these prevalence variations[12].

Elderly women frequently suffer from chronic low back pain (CLBP), which has a major adverse effect on their quality of life and ability to function daily[13]. Even though the particular difficulties faced by older women with CLBP have

become more widely recognised, there is a noticeable lack of information in the literature about targeted interventions created specifically for this population[14]. LBP is an all too common, intricate, and challenging medical condition to treat. Although early conservative therapy may be helpful in cases of acute LBP, chronic LBP often demands costly invasive intervention[15]. LBP is linked to ongoing or persistent disabilities that prohibit people from working and have an important economic effect on society. Although CLBP has been effectively addressed by community-based group therapy in a selection of populations[16], little is known about how effective this type of therapy is for older women. Despite the fact that it has been acknowledged to be an important medical problem, little is known as to the extent to which it is among the elderly[17].

By evaluating the effectiveness of group therapy interventions customised to the particular requirements of older women with chronic low back pain, this study aims to close this knowledge gap. Previous studies have demonstrated that group-based interventions can improve pain outcomes and psychological well-being in various chronic pain populations. Nevertheless, there is still much to learn as to how to apply these findings to the unique situation of older women who have persistent low back pain. So the sole purpose of this study was to explore the effectiveness of community-based group therapy for the management of chronic low back pain in older women.

Material and Methods

Study design

This was a centre- and community-based, assessor-blind, prospective, two-parallel-armed Randomized Controlled Trial comparing the effectiveness of community-based group therapy and Institution-Based treatment for the management of chronic low back pain among older women in Bangladesh.

Participants

Forty older women having low back pain were recruited into the study; from March to November 2023. The evaluation measures were explained to each participant. Evaluations and interventions for the IBR group were performed at the Department of Physiotherapy and Rehabilitation, Jashore University of Science and Technology, and for the CBR group in Islampur Village, Churamonathi, Jashore district, in the Southwestern area of Bangladesh. A simple randomisation technique was used to draw out the samples from the population, and a computerized random allocation technique was used to allocate the participants into either of the two groups. An independent assessor enrolled participants and assigned them to either intervention.

The study population consisted of older women aged 50 or older who had new episodes of low back pain lasting for 12 weeks and who were willing to participate in the trial. The study excluded potential participants who had a history of significant heart or respiratory illness, severe blood disorders, including anemia or bleeding disorders such as hemophilia, blood clots, and blood cancers such as leukemia, lymphoma, and myeloma, had a mental illness, or participation in another health promotion program within the last few months. The older ladies were then approached by an independent assessor who briefed them on the study's objectives and invited them to take part in a physical therapy session so that their severity of pain and disability could be assessed. After completing a written permission form, the older women were randomised into either the IBR group or the CBR group.

Sample size

The sample size was determined based on statistical power analysis procedures using the PASS 2005 software (NCSS, Kaysville, UT, USA). Based on a sample size with

a power size estimation of the study beta being 80% and to detect an effect size of difference at 5% having a significance level of p-value<0.05, 40 participants were needed.

Intervention

Experimental group participants received community based group therapy in a field setting of Islampur Village, Churamonathi, Jashore, wherein 20 participants were divided into two groups. These received the same exercises for 10 repetitions, with a 5-second hold, 3 times daily for 5 weeks. Control group participants received the same protocol in the Department of Physiotherapy, Jashore University of Science and Technology, Jashore-7408; Bangladesh.

Repetitive flexion in the lying position

A skilled physical therapist treats the patient by having them perform repeated flexion exercises while in a lying position. First, the patient initially lays on her back; next: places her feet flat on the ground and bends her knees. Ten repetitions of three sets for this exercise are required each day. Secondly, she gently lifts her knees to her chest and places her hands over her knees; she can grab her thighs beneath her knees if pressure causes pain in her knees. Next, she slowly brings her knees up to her chest, maintain this stance for three seconds. Then she allows her knees to slowly revert back to their starting position. Her knees should be bent, and her feet should be flat on the ground[18].

Repetitive flexion in the sitting position

The patient begins the seated lumbar flexion exercise by sitting straight in a chair. It is recommended that the patient bends forward gradually until tension in their back is felt. This exercise has to be performed 10 times; with 3 sets per day[19].

Stretching exercise

Hamstring muscle group stretching is a straight-leg-raising technique which the patient does while in the lying position. It is performed and held for 5 seconds; 3 times per day[20].

Quadriceps muscle stretching

The patient does this exercise via this procedure: They place their left hand over their head while lying face down. Alternatively, they can carry out this stretch while lying on their side. She pulls her right foot toward her buttocks and bends her left knee, so as to stabilise herself after a few seconds. After holding onto her ankle and staying there for thirty seconds, she then repositions herself back to the starting position. Changing sides, she then bends her right knee, drawing her left foot towards her back. All stretching exercises are done for 10 repetitions, with a 5-second hold; 3 times daily for 5 weeks[21].

Outcome measures

Pain

In the mid-1990s, the concept of quantifying pain as the: "fifth vital sign," was promoted as a method to enhance the quality of pain management[22]. The numeric pain rating scale (NPRS) is a widely used measure for evaluating pain intensity at a certain instant. It employs a scale of 0 to 10, wherein zero represents the absence of pain and ten represents the most severe pain imaginable[23].

Disability

The Roland-Morris Low Back Pain and Disability Questionnaire is a 24-item self-reporting questionnaire in concerns as to how low-back pain affects functional activities. Each question is worth one point, so scores can range from 0 (no disability) to 24 (severe disability)[24].

Statistical analysis

The statistical analysis was carried out using IBM Statistical Package of Social Science (SPSS) Version 25. The normal distribution of the data was ascertained using the Kolmogorov–Smirnov test. The Mann–Whitney test was used to compare scores across groups, and the Wilcoxon Signed Rank test was utilised to analyse changes within groups. The α value was set to 0.05. In this trial, there was 'no intention to treat protocol' used.

Results

From March to November 2023, sixty-eight participants were screened, of whom 40 older women with LBP met the criteria, and were randomly allocated to CBR care (n=20) or IBR care (n=20) groups. One participant in the CBR care group did not continue treatment until the last session because her family was not supportive of the exercise program and had expressed negative thoughts about it. On the other hand, in the IBR care group, one participant gave consent and took some sessions of treatment; however, after that, she was suddenly absent from the whole treatment program. So, in total, forty participant outcomes were analyzed (Figure 1).

The socio-demographic and clinical information of the participants for both groups is summarised in Table 1. The average age of the total participants was 56 (53 to 58.50) years. The average duration of Pain in the CBR group was 11 (7 to 13) months; whereas, in the IBR group

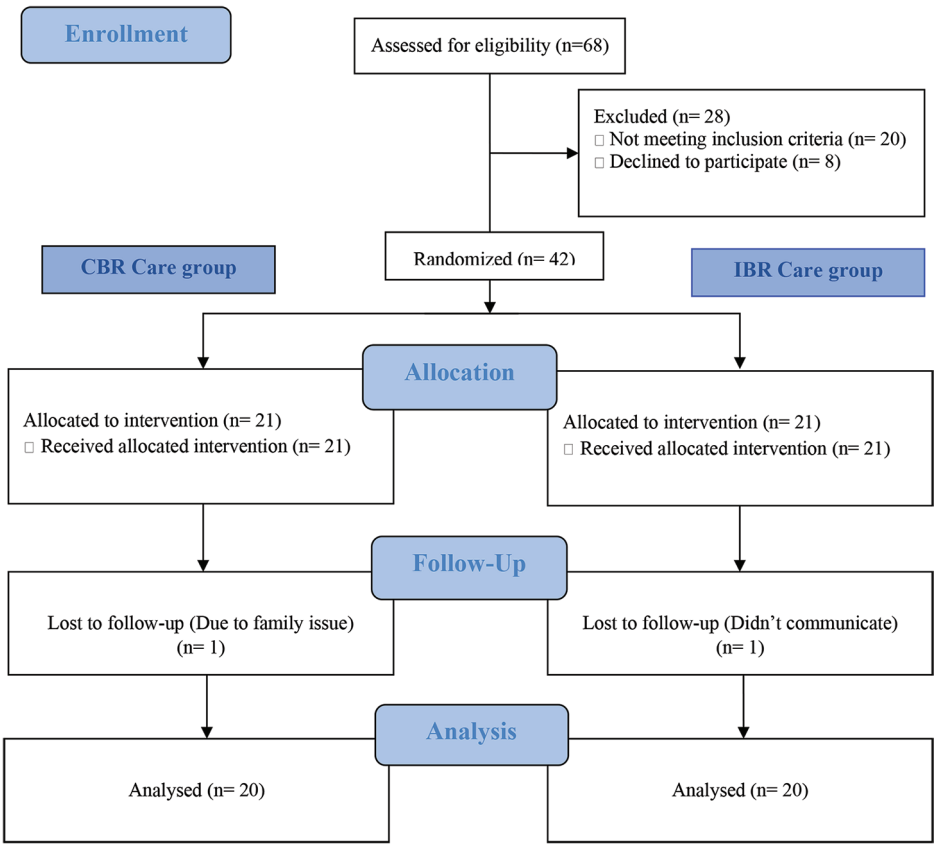

Figure 1 Consolidated Standards of Reporting Trials (CONSORT) flowchart of this study

this was 9.5 (8 to 11) months. In the CBR group the median BMI was 22.45 (19.75 to 29.85), whereas in the IBR groups it was 28.87 (20.45 to 32.45). Most of the participants in the CBR groups had no formal education (42.0%, n=9); on the other hand, 51.6% (n=11) of participants had a higher level of education in the IBR group. Most of the participants in both groups had complained about pain in both lower limbs: 42.0% (n=9) in the CBR group and 61.3% (n=13) in the IBR group, respectively, and in both groups, most of them had a burning type of pain.

In intergroup analysis between both groups, there was significant improvement (p-value<0.01) in pain intensity and functional ability (Table 2). The median difference between baseline and after treatment was higher in the CBR group rather than in the IBR group.

In intragroup analysis, there was a significant improvement in pain intensity and functional ability found among the CBR group participants (p-value<0.01); however, no significant changes were found in the IBR group (p-value>0.05) (Table 3).

Table 1 Socio-demographic and clinical characteristics of participants

Variables	CBR Group % (n)	IBR Group % (n)	p-value
Age of participants (years) Median (IQR)	58 (51 to 59.50)	57 (53 to 61)	0.453[a]
Duration of Pain (months) Median (IQR)	11 (7 to 13)	9.5 (8 to 11)	0.067[a]
Body mass index (BMI) Median (IQR)	22.45 (19.75 to 29.85)	28.87 (20.45 to 32.45)	0.378[a]
Education			
Illiterate	42.0 (9)	19.4 (4)	
Up to SSC and SSC	38.7 (7)	29.0 (5)	0.246[b]
HSC and above	19.4 (4)	51.6 (11)	
Location of pain			
Back and one L/L	19.4 (4)	29.0 (5)	
Back and both L/L	42.0 (9)	61.3 (13)	0.543[b]
Only back	38.7 (7)	9.7 (2)	
Characteristics of pain			
Burning	80.6 (16)	51.6 (11)	0.197[b]
Paresthesia	19.4 (4)	48.4 (9)	

[a]=Mann-Whitney U test, [b]=Pearson Chi-square test, IQR=inter quartile range, CBR=community based rehabilitation, IBR=institute-based rehabilitation, SSC=secondary school certificate

Table 2 Intergroup analysis of pain intensity and disability of the participants after completing rehabilitation (Mann-Whitney U test)

Numeric pain rating scale	CBR group (n=20) Median (IQR)		IBR group (n=20) Median (IQR)		p-value
	Baseline	After treatment	Baseline	After treatment	
Pain right now	5 (5 to 7)	2 (2 to 2)	6 (6 to 7)	5 (5 to 6)	0.001*
Usual pain in last week	5 (5 to 6)	2 (2 to 2)	5 (5 to 6)	4 (4 to 5)	0.001*
Best level of pain in last week	4 (4 to 5)	1 (1 to 2)	5 (5 to 6)	5 (5 to 5)	0.001*
Worst pain in last week	7 (7 to 8)	4 (3 to 4)	8 (8 to 9)	7 (7 to 8)	0.001*
Roland-Morris low back pain and disability questionnaire	5 (4 to 6)	2 (1 to 2)	6 (6 to 6.25)	6 (5 to 6)	0.001*

*significant at 95% confidence level CBR=community based rehabilitation, IBR=institute-based rehabilitation, IQR=inter quartile range

Table 3 Intra group analysis of pain intensity and disability of the participants (Wilcoxon Signed Rank Test)

Numeric Pain Rating Scale	CBR Group (n=20)		IBR Group (n=20)	
	z-value	p-value	z-value	p-value
Pain right now	2.850	0.004*	2.460	0.039*
Usual pain in last week	2.840	0.005*	1.520	0.317
Best level of pain in last week	2.842	0.004*	1.537	0.397
Worst pain in last week	2.972	0.003*	1.080	0.560
Roland-Morris low back pain and disability questionnaire	2.823	0.005*	1.890	0.059

*significant at 95% confidence level CBR=community based rehabilitation, IBR=institute-based rehabilitation

Discussion

The purpose of the study was to evaluate the effectiveness of community-based group therapy for chronic low back pain in older women. The results of this study's findings reveal that the researcher assesses patients with chronic low back pain and measures their pain using the Numeric Pain Rating Scale and their disability with the Roland-Morris Questionnaire Disability. These measurements were recorded before and after the intervention. In this study, the researcher wanted to prove the experimental hypothesis by manipulating the evidence-based treatment protocol for patients with chronic low back pain that willingly took part in group therapy. Moreover, the results of the study intervention were proven by descriptive analysis according to their exercise protocol that was given during the intervention period[25]. Exercise for low back pain is beneficial for accelerating improvements in daily life and return to work. When compared to patients that received no treatment or other conservative treatments, patients with CLBP treated with exercise therapy demonstrated a significant improvement in terms of pain and functional status based on meta-analysis[26].

Among the participants (n=40), different levels of sociodemographic status groups were inclined, and it was found that the mean age was 58 years, with a standard deviation of 6.16. When comparing to another result from another research, it was found that the mean was 74.1, and the standard deviation was 6.1. The results of this research were not significant, as the p-value was 0.46[27]. Furthermore, the study also found that there were other diseases among the older women participants: 11 had diabetes, (27.5%), 10 (25%) had heart disease, 11 (27.5%) had hypertension and 8 (20%) had other diseases; except diabetes heart disease or hypertension. The study also noted patient height, weight and BMI, with the mean being: 1.49, 62.85 and 28.87; with the standard deviation being: 11.16, 7.09 and 5.36.

When conducting this study, the researcher noted the BMI status among its older women cohort. According to BMI weight ranges within the 40 participants, 7.5% were underweight, 22.5% were normal weight, 45.0% were overweight and 25.0% were obese. A number of cross-sectional studies have shown that individuals that are overweight or obese have a higher prevalence of chronic low back pain (LBP), though some studies were unable to find a clear correlation[28]. The rates were roughly as follows: 57.20% and 58.00% for BMIs under 25, 50.80% and 51.1% for BMIs between 25 and 29.90, and 57.20% and 58.00% for BMIs 30 and higher. On the other hand, the researcher noted the exercise status among its older women participants. Some patients were performing exercises before the treatment intervention of chronic low back pain.

However, most of the patients were not doing any kind of exercise before the group therapy intervention.

The researcher also calculated the mean and standard deviation of the NPRS scores and the Roland-Morris Disability scores. Herein, the NPRS score mean was 5.93 and the Roland-Morris Disability score mean was 12.90. Their standard deviation were 0.98 and 2.60. A problem with using the NPRS for pain measurement is that, in contrast to an adjective or numeric scale, it has a relatively high failure rate. According to some researchers, 7–11% of patients in the study were unable to complete the Numeric Pain Rating Scale (NPRS)[29]. Results for Valenza showed significant differences in the pilates group's disability scores; the Oswestry scale benefited as well (p-value<0.001), and the Roland-Morris Disability Questionnaire among groups showed a difference of 3.2±4.12, p-value=000.3[30].

For patients who have performed exercise three times per day after intervention, their quality of life was good compared to those who have not performed exercise daily[31]. The researcher also found out the effectiveness of community-based group therapy on the activities of daily living in patients with chronic low back pain. Among patients given treatment with group therapy, the researcher calculated the results, in which the NPRS score mean was 5.93, and the Roland-Morris Disability score mean was 12.90, with standard deviation being 9.42 and 2.60. Additionally, it was also found that the normality test of the NPRS score and Roland-Morris Disability scores were 0.0001 and 0.046; indicating that means for the NPRS score were highly significant as well as the Roland-Morris Disability score also significant.

This study's strengths included being the first, to our knowledge, to directly evaluate the impact of CBR group therapy exercise on pain intensity and disability; using precise methods rather than self-completed questionnaires. It also focused on participants that are representative of the general public rather than athletes. Furthermore, it used a randomised controlled trial design with blinded assessors, supervised participant follow-up, and long-term structured group therapy exercises.

However, it must be noted that the small number of older women participating in this study and the fact that there are numerous variables that could be connected to the development of psychological and physical conditions of low back pain and older women; such as their lifestyle, diet, relationships, professional obligations, economic status, and many others, limited this study's ability to determine the impact of group therapy exercise accurately.

Conclusion

Community-based rehabilitation settings for Chronic low back pain not only improved treatment adherence but also fostered a supportive environment that boosted general well-being. These findings emphasise the significance of community-based group therapy as a pragmatic and advantageous intervention for addressing chronic low back pain in older women, providing a promising opportunity for improving functional activity in this demographic.

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