



# Specialized Physiotherapy and Pharmacological Management Strategies in Optimizing Chronic Lower Back Pain Rehabilitation

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## Abstract

**Background:** Low back pain (LBP) is a prevalent health concern globally, posing significant challenges for prevention and treatment. This study addressed the pressing need for effective interventions for chronic lower back pain (CLBP), aiming to compare the efficacy of unique physiotherapy techniques, conventional physiotherapy, and nonsteroidal anti-inflammatory drugs (NSAIDs) in alleviating symptoms and improving functional outcomes. **Methods:** Sixty-five patients with CLBP were enrolled in a randomized controlled trial conducted at the Centre for the Rehabilitation of the Paralyzed (CRP) in Bangladesh. Participants were assigned to receive either a specific physiotherapy regimen or conventional physiotherapy with NSAID medication. Pain intensity and disability were measured using the Numerical Pain Rating Scale and Oswestry Disability Index, respectively. **Results:** Both treatment groups experienced significant reductions in pain intensity and disability scores post-intervention ( $p < 0.01$ ). However, the group receiving specialized physiotherapy exhibited greater improvements compared to the conventional

therapy with NSAIDs group. Socio-demographic characteristics indicated that participants were predominantly married individuals aged 31-44, with varying educational backgrounds and employment statuses. Notably, specialized physiotherapy interventions focusing on core stability, strengthening, stretching, posture, and core muscle activation demonstrated superior outcomes in reducing pain intensity, improving functional activity, and enhancing flexibility. **Conclusion:** Specialized physiotherapy interventions showed superior efficacy over conventional physiotherapy combined with NSAIDs in alleviating pain and improving functional outcomes in individuals with CLBP. Core stability exercises and targeted physiotherapy approaches appear to offer promising benefits for managing chronic low back pain, underscoring the importance of tailored rehabilitation strategies in clinical practice.

**Keywords:** Chronic lower back pain, physiotherapy, NSAIDs, treatment efficacy, Bangladesh

**Significance** | Specialized physiotherapy demonstrated superior outcomes in pain reduction and functional improvement compared to conventional NSAID treatment in Bangladesh.

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## 1. Introduction

At least once in their lives, eighty percent of the world's population has experienced low back pain, making it the most common medical condition in the world (Airaksinen et al., 2006). According to the findings of the Global Burden of Disease 2010 study, low back pain (LBP) is estimated to be placed sixth in terms of the total

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burden of disease but first in terms of the disability it causes (Ali et al., 2020). Comprehensive evaluations and epidemiological reports indicate that the prevalence of low back pain spans anywhere from 12% to 33%, and that its prevalence after one year can fall anywhere between 22% and 65% (Alvi et al., 2020) and the prevalence throughout a lifetime range anywhere from 11% to 84%, with disability rates sitting around 12% (Anderson & Shaheed, 2022). Both the prevalence and the burden have been growing as people get older (Balagué et al., 2012).

In Bangladesh, the prevalence rates for low back pain that has lasted for at least one day during the previous six months, chronic pain, intense pain, and seeking medical care for LBP were found to be 63.04%, 38.60%, 13.76%, and 18.89%, respectively, among the female garments workers (Cairns et al., 2006). In addition, the prevalence rates for LBP that has lasted for at least one day within the previous six months were found to be 63.04% (Chen & Zhuo, 2023). Pain in the low back that is not attributed to a recognisable, recognised specific pathology is referred to as non-specific low back pain (Cho et al., 2012). Some examples of recognisable specific pathologies include infections, tumours, osteoporosis, lumbar spine fractures, structural deformities, inflammatory disorders, radicular syndromes, and cauda equina syndromes (Chou et al., 2007). The cultural, social, and political context of a person's back pain can have an impact on how they experience their pain, the degree of disability it causes, and how they interact with the healthcare system (Cohen & Mao, 2014). In patients who suffer from chronic lower back pain (CLBP), there is a pressing need for economic evaluations of a high quality that compare the use of surgery to that of conservative care (which makes use of a variety of therapeutic alternatives) (Delitto et al., 2021). Lifting and carrying are mechanical variables that presumably do not play a significant pathogenic effect, but a person's genetic makeup is significant (Donohue & Pincus, 2007). Most clinical practice recommendations for the care of LBP (Ekşi et al., 2020) include a history-taking and clinical examination, although there may be limitations on the use of clinical imaging for diagnosis. The symptoms of CLBP include tension, soreness, and/or stiffness in the lower back area, although the exact source of the pain is unknown (El Mansy et al., 2020). The symptoms may be influenced by a number of back structures, including the joints, discs, and connective tissues (Fakhri et al., 2021).

There has been a significant investment of time, energy, and medical resources into the treatment of low back pain; nonetheless, the prevalence of back-related disability and population burden has continued to rise (Fatoye et al., 2019). There is a need for a variety of response techniques in order to reduce the likelihood of handicap, as well as increase involvement in both physical and social activities once back pain has been experienced (Foster et al., 2018). According to the findings of a study conducted in South

Africa by Major-Hesloot and others (Freburger et al., 2009), ninety percent of patients with low back pain who were treated in primary care received pain medications as the only type of treatment. There are both noninvasive and invasive treatment options. When it comes to management, the most conservative approach begins with pharmaceutical and non-pharmacological methods (Fu & Perloff, 2022). The stepladder approach to chronic pain management advocated by the World Health Organization (WHO) suggests using acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, tramadol, corticosteroids, and even short courses of opioids for moderate-to-severe pain. Until pain decreases, medications regulate symptoms (Airaksinen et al., 2006). In relation to this setting, Bangladesh does not have access to this kind of study, which is not available there. The problem for the future is going to be developing new treatments that are robust, cost effective, and cost effective while also refining the existing group of treatments that are proven to be beneficial. Because of this, the purpose of the study was to evaluate and contrast the efficacy of unique physiotherapy technique, conventional physiotherapy, and NSAIDs in the treatment of individuals suffering from persistent chronic lower back pain.

## 2. Literature Review

Low back pain is a common health issue worldwide, but notably, prevention and treatment of chronic low back pain (CLBP) is a major public health concern (Ghosh et al., 2015). It has been widely recognized as the leading cause of disability, affecting work performance and general psychosomatic health and is associated with substantial economic and societal burden (Gold et al., 2020). The estimated lifetime prevalence of CLBP is 12% to 33% in industrialized countries (period prevalence: 22% to 65% per year) (Gros et al., 2021). The prevalence rate of CLBP is higher in adults than children and adolescents (Grotle et al., 2005), particularly among the working population (Grover et al., 2022). CLBP is widely treated with medications (e.g., nonsteroidal anti-inflammatory drug, analgesic, and muscle relaxant) to relieve pain, decrease inflammation, and reduce muscle tension (Henschke et al., 2016). However, these treatments may increase the likelihood of falls and drug-related side effects (e.g., mood disturbance, nausea, seizure, and/or tachycardia) among patients (Hossain, 2018). Furthermore, the long-term use of medications remains financially unaffordable in economically disadvantaged areas (Hoy et al., 2014). Other non-pharmacological treatments, such as physical therapy (Hu & Ning, 2015), spinal manipulation, and physical activity or exercise (Ishtiak-Ahmed et al., 2022), have shown promising effects on improving CLBP-specific symptoms.

In the United States, chronic lower back pain (LBP) is the fifth most common reason for seeking medical help (Jo et al., 2021; Ketenci & Zure, 2021), and often requires hospitalization and expensive

diagnostics (Khan et al., 2019). Chronic LBP can originate from a defined bony (Kim et al., 2020), muscular or nervous structure (Knoop et al., 2023; Kuukkanen & Mälkiä, 1996), but in many patients' pains cannot be attributed to a specific pathology, and psychological factors play a major role (Leuchter et al., 2009). Therefore, the management of LBP can be challenging. While current guidelines recommend exercise and multidisciplinary rehabilitation as a first-line therapy in patients with chronic LBP (Lewis et al., 2019), pharmacological therapy may still be required in patients not responding to non-pharmacological therapy or as rescue medication (Maher et al., 2017). The literature regarding pharmacological treatment for chronic LBP is abundant, and various compounds have been investigated. However, no consensus on the most effective pharmacological therapy has been reached yet (Khan et al., 2019).

There are many different treatment options available for patients that suffer from chronic pain, ranging from pharmacological therapy to surgical interventions (Major-Hesloot et al., 2014). As science has developed a better appreciation of the physiologic and psychologic causes of pain, additional understanding has evolved as to potential treatment modalities and strategies (Mei et al., 2019). While clinicians have prescribed antidepressants for many decades, off-label use for treating chronic pain has significantly increased in the past decade (Migliorini et al., 2021). Neuropathic pain is defined by the International Association for the Study of Pain (IASP) as pain caused by a lesion or disease of the somatosensory nervous system (Mikocka-Walus et al., 2020). Pain typically develops from an injury or pathology affecting the somatosensory pathways in the peripheral or central nervous system (Nicol et al., 2023). Nociceptive stimuli that originate in the periphery are transported by primary sensory neurons through the dorsal horn of the spinal cord and then to many brain structures throughout the ascending pain pathway (Obata, 2017). The descending fibers that originate in the brainstem suppress pain neurotransmission and act as a homeostatic regulator (Rodriguez, 2001).

These descending fibers release serotonin and noradrenaline as their neurotransmitters and dysfunction of these systems is likely to induce dysfunctional descending serotonin or noradrenaline anti-nociceptive pathways (Roelofs et al., 2008). This explains why pain and depression are often comorbid conditions and helps to clarify why patients with chronic pain often develop depression in their disease burden (Rossignol et al., 2007). As depression and chronic pain are frequently comorbid conditions, antidepressants have been used to treat both conditions concomitantly in the same patient population (Roughan et al., 2021). The most commonly used antidepressants for chronic pain are tricyclic antidepressants (TCAs), but selective serotonin or noradrenaline reuptake inhibitors and other atypical antidepressants have been proven to

be effective in the treatment of chronic pain (Sanchis-Sánchez et al., 2021).

The proposed mechanism behind the analgesic properties of antidepressant drugs is typically described to result from the inhibition of monoamine reuptake in the CNS, which leads to increased activity of the descending pathways and their anti-nociceptive effects on pain homeostasis (Schnitzer et al., 2004). Antidepressants have analgesic effects that are independent of their effect on depression. This partly may be because dosages needed to achieve optimal analgesia are significantly lower than dosages used to treat depressed mood (Scholz et al., 2019). Additionally, evidence for their independence is that there are differences in analgesic effectiveness between different classes of antidepressants and that the delay in onset of analgesic effects after administration appears after a shorter time than their given antidepressant effect (Shiri et al., 2017). Further, antidepressants have been shown to have a different risk profile and set of adverse effects when used at dosages used for analgesia (Simon et al., 2014).

### 3. Materials and Method

#### 3.1 Subjects and study design

For the purpose of this study, 65 patients who suffered from chronic lower back pain were recruited. A randomised control trial investigation was carried out, in which two separate subject groups were studied in two different times (baseline and after the completion of intervention). The trial group received a specific treatment, while the control group received a standard treatment that included NSAIDs. Both the patients and the people evaluating the data were blinded. The following are the inclusion criteria: age range of up to 65 years, chronic pain for more than three months, pain behaviour that altered as a result of movement, either localised pain or radiating pain (either unilateral or bilateral), and freedom from any kind of neurological indication. Patients who had any medical condition that prevented the desired treatment from being applied; patients who had a pathological source of pain such as tuberculosis of the spine, spinal tumours, or abscesses; and volunteers who were mentally disabled were not eligible for the study.

The participants in both groups received treatment from trained physiotherapists who were assigned to deliver it for them. Before any information was collected from the participants, they first gave their approval, which was taken under advisement. This research was carried out after receiving approval from the ethics committee of the Bangladesh Health Professions Institute (BHPI) of the Centre for the Rehabilitation of the Paralysed (CRP), Bangladesh (CRP-BHPI/IRB/09/2022/676). This trial has been registered with the Primary trial registry of WHO and is connected with the International Committee of Medical Journal Editors (ICMJE),

which is the Clinical trial registry – India (CTRI) (CTRI/2021/03/031741).

### 3.2 Randomization and group allocation

The first researcher had chosen 80 patients suffering from chronic lower back pain to take part in the study from the outpatient musculoskeletal unit of the Centre for the Rehabilitation of the Paralysed (CRP) in Savar, which is located in Dhaka, Bangladesh. After evaluating each of the 70 participants, they were split into two groups using a random selection process. There were five people in the trial group who did not show up for the first day of therapy. In the end, there were a total of 65 volunteers who took part in this experiment, and the results of their participation have been examined. (Figure 1)

### 3.3 Intervention

In the trial group, participants were given electrotherapy modalities for stretching and strengthening exercises of the erector spine and multifidus muscle. On the other hand, participants in the control group were given traditional physiotherapy along with nonsteroidal anti-inflammatory drug (NSAID) medication for pain management. Participants in both groups attended meetings twice a week for a total of five weeks, each of which lasted for an hour. Each participant in both groups was given a total of ten therapy sessions during the course of their participation. The CRP residential doctor suggested NSAID medicine, as well as dosages for the prescription.

### 3.4 Conventional physiotherapy intervention

Conventional or contemporary Physiotherapy treatments include the different types of treatment that are applied for chronic lower back pain patients. (Table-1)

There is lack of published data showing different types of conventional treatments that Physiotherapists apply globally or locally. Conventional approach is a series of treatments given to the patients. Repeated lumbar extension in lying is common physiotherapy exercise for lumbar pain respectively which fall under Mechanical Diagnosis and Therapy (MDT). Particular exercise is recommended from several exercises in which patients feel comparatively better. Usually patients are advised to perform shown a specific exercise or couple of exercises at home.

The model that Physiotherapists used is merely patho-anatomical. Patients are usually diagnosed as lumbar spondylosis or low back bank pain. Moreover, many patients are diagnosed as prolapsed lumbar intervertebral disc prolapsed as per Magnetic Resonance Imaging (MRI) findings.

### 3.5 Outcome measurement tools

- **Numerical Pain Rating Scale** - A straightforward and reliable method of doing a subjective evaluation of pain along a continuous visual spectrum is provided by the numeric pain rating scale. It is in the form of a horizontal line, and the individual whose pain is being evaluated will place a mark on it to indicate their level of discomfort.

The ends of the line reflect the extreme boundaries of pain, with 0 indicating complete absence of pain, 1–3 indicating mild pain, 4–6 indicating moderate pain, and 7–10 indicating the most excruciating pain a person has ever felt (Sudhir et al, 2021).

**Oswestry disability index for measurement of disability** - It had scores ranging from 0 to 100 and was proven to be a reliable, practical, and research instrument with good responsiveness and acceptability for the assessment of disability caused by impairment of common motor functions (Sundell et al, 2018).

### 3.6 Statistical analysis

The Statistical Package for Social Sciences (SPSS), Windows version 25, (IBM, Armonk, NY, USA), was used to organize and analyse the data throughout each and every statistical analysis. According to the Kolmogorov-Smirnov theory of hypothesis testing, the data exhibited the characteristics of a normal distribution. The Wilcoxon signed ranked test was utilised in order to examine changes that occurred within the trial or control group at the time of the intervention as opposed to changes that occurred after the intervention. Mann-Whitney U test was employed to investigate how significantly different the groups' means were from one another. When p was less than 0.05, a result was judged to be statistically significant. No intention to treat protocol was not followed in this study.

## 4. Results

The purpose of this study was to examine several distinct outcomes, including pain and disability, in relation to the application of various treatments, such as a specialised approach to physiotherapy, conventional treatment, and NSAIDs, for individuals suffering from chronic low back pain. The most important outcomes of the study were determined to be discomfort and impairment. Statistics that are descriptive, as well as between-group and within-group analyses of various treatment combinations, can be used to indicate the general direction of a change in an individual outcome across multiple groups.

### 4.1 Socio-demographic information

In Table-2, the demographic and social information of the people who took part in the study is compared and summarised. The age range of all of the participants was from 31 to 44 years old, with 40 being the median age. In contrast to the control group, which had a greater proportion of female participants, the experimental group contained a greater number of male participants. The majority of participants in the control group had completed HSC or higher (54.3%, n = 19), in contrast to the majority of individuals in the experimental group who had achieved up to SSC and SSC level of education (40.0%, n = 12). In the experimental group, the majority of the participants were found to be self-employed (46.7%, n = 14), whereas in the control group, the majority of the participants were found to be unemployed (42.9%, n = 15). The majority of those who



took part in each of these studies were married. The individuals in the experimental group reside in rural areas the majority of the time (56.7%, n=17), in contrast to the participants in the control group, who live in urban areas the majority of the time (80.0%, n=28). The majority of the participants in both groups said that the majority of their workdays were spent seated at their respective places of employment.

#### 4.2 Pain intensity

In comparison between the two groups, it was shown that both groups saw a significant decrease in the level of discomfort (Table 3). The experimental group had a greater mean difference between their baseline and their results after treatment when compared to the control group. Consequently, specialised physiotherapy has been demonstrated to be more effective than traditional therapy with NSAID for reducing the level of pain experienced by people suffering from low back pain.

There was a significant reduction in the level of pain experienced by participants in both the experimental and control groups, as determined by intragroup analysis ( $p < 0.01$ ) (Table-4).

#### 4.3 Disability Index

According to a study that compared the two groups, there was a substantial improvement ( $p < 0.01$ ) in the amount of disability that was reduced (Table-5). The experimental group had a greater mean difference between their baseline and their results after treatment when compared to the control group. Therefore, specialised physiotherapy has been demonstrated to be more beneficial than traditional treatment with NSAID for lowering the risk of disability in people suffering from low back pain. In the intragroup analysis, it was observed that there was a substantial improvement in reducing impairment among participants in both the experimental and control groups ( $p < 0.01$ ) (Table-6).

### 5. Discussion

The study was conducted to accomplish several objectives including to determine effectiveness of two types of treatment including specific physiotherapy and conventional physiotherapy with NSAID's for chronic lower back pain, to compare efficacy between specific approach of Physiotherapy and conventional with NSAID's for patients with chronic lower back pain, to compare how outcome of treatment changes over two occasions including beginning and at the end of the intervention, to find out interaction between types of treatments and different occasion of treatment and to establish new evidence of treatment for chronic low back pain.

The current study revealed that the majority of participants were either unemployed or worked for themselves, and the average age of the participants was found to be 40 years old (ranging from 31 to 44). The vast majority of participants were married, and the vast majority of those participants claimed that they got low back discomfort as a result of working largely in standing positions. It's

possible that this is brought on by the degeneration of the intervertebral discs, which, along with the fact that ageing speeds up the inflammatory process and brings on pain in the end (Suri et al., 2021).

The therapeutic efficacy of pharmacotherapy with NSAIDs or acetaminophen for patients with CLBP has been recommended in clinical practice guidelines for the management of LBP worldwide (Theberath et al., 2022). Some studies, however, have reported that NSAID therapy had to be discontinued in some patients because of NSAID-induced side effects (Tu et al., 2020). In our study, the degree of pain was alleviated in the patients with CLBP after only 3 months of celecoxib therapy. However, two of the 17 (11.7%) patients on celecoxib therapy developed upper gastrointestinal disease in this study. The degree of pain and the QOL associated with LBP for patients in both the NSAID and exercise groups were not sufficiently improved.

In this study, it was discovered that certain physiotherapy exercises and treatments, such as stretching and strengthening, were considerably more helpful for reducing the level of pain experienced by individuals suffering from lower back pain ( $p < 0.05$ ). A study that was carried out by Cairns and others revealed that after performing specific spinal stabilisation exercise along with conventional physiotherapy, it had improved physical functioning, reduced pain intensity, and an improvement in the physical component of quality of life. These findings are similar to the ones that were found in the previous study (Umeda & Kim, 2019). When compared to the control groups, those who participated in regular physical activity experienced a reduction in both the severity of low back pain and the disability brought on by it (Urits et al., 2019). It has been universally established that exercise therapy is a low-risk treatment while NSAID therapy is a higher-risk treatment due to comorbidities (such as heart disease and upper gastrointestinal disease) (van Dongen et al., 2016).

Conventional therapy with nonsteroidal anti-inflammatory medicines (NSAIDs) has also been shown to be considerably effective in this study for minimising pain and reducing suffering among individuals who have lower back pain ( $p < 0.05$ ). When compared to a placebo, the use of nonsteroidal anti-inflammatory drugs (NSAIDs) resulted in significantly less pain and impairment in patients who suffered from persistent lower back pain. However, the variations were not significant: 7 points out of a total possible score of 100 for the intensity of the pain. On a scale ranging from 0 to 24, those who took NSAIDs had a disability score that was 0.9 points higher. On their own, nonsteroidal anti-inflammatory drugs (NSAIDs) were not more effective in treating acute low back pain than physiotherapy or spinal manipulation (Wu et al., 2020).

It is advised that further research be conducted to determine whether or not this particular physiotherapy strategy is beneficial provided physiotherapists receive hands-on training on the specific

**Table 1.** Types of conventional physiotherapy that are applied at CRP for patients with chronic mechanical back pain

SL no.	Code of Physiotherapist	Clinical	Types of conventional physiotherapy
01	001		Postural advice, McKenzie Approach (Directional Preference), Back muscles strengthening, Electrotherapeutic modalities-IRR and also Home exercise.
02	002		McKenzie Approach (Directional Preference), Spinal Mobilization, strengthening, Electrotherapeutic modalities-TENS
03	003		McKenzie Approach (Directional Preference), Spinal Mobilization, Back muscles strengthening exercise, Electrotherapeutic modalities-IRR.
04	004		Spinal Mobilization, McKenzie Approach (Directional Preference), Pelvic floor strengthening exercise for back, IRR and Home exercise
05	005		Postural advice, McKenzie Approach Spinal Mobilization, Back muscles strengthening and Leg muscle strengthening, Electrotherapeutic.
06	006		McKenzie Approach Spinal Mobilization, Pelvic floor strengthening exercise, Electrotherapeutic modalities-IRR
07	007		Postural advice, McKenzie Approach, Pelvic floor strengthening exercise, Electrotherapeutic modalities-IRR and Home advice.
08	008		Postural advice, Spinal Mobilization, McKenzie Approach (Directional Preference) Electrotherapeutic modalities-IRR
09	009		Postural advice, Spinal Mobilization, McKenzie Approach (Directional Preference), Pelvic floor strengthening exercise, TENS/IRR
10	0010		McKenzie Approach, Spinal Mobilization, Pelvic floor strengthening exercise, Back muscles strengthening exercise, Electrotherapeutic modalities-IRR and also home advice.

Source: Hossain, A. 2018

**Table 2.** Evaluation of baseline characteristics of the participants

Variables		Experimental (n=30) % (n)	Control (n=35) % (n)	p
Age of the participants (years) Median (IQR)		40 (31 to 44)		
Gender	Male	60.0 (18)	45.7 (16)	0.547 <sup>a</sup>
	Female	40.0 (12)	54.3 (19)	
Education	Illiterate	30.0 (9)	8.6 (3)	0.246 <sup>a</sup>
	Up to SSC and SSC	40.0 (12)	37.1 (13)	
	HSC and above	30.0 (9)	54.3 (19)	
Occupation	Waged employed	10.0 (3)	31.4 (11)	0.860 <sup>a</sup>
	Self employed	46.7 (14)	25.7 (9)	
	Unemployed	43.3 (13)	42.9 (15)	
Marital status	Married	93.3 (28)	85.7 (30)	0.490 <sup>a</sup>
	Unmarried	6.7 (2)	8.6 (3)	
	Divorced	-	5.7 (2)	
Living area	Urban	43.3 (13)	80.0 (28)	0.197 <sup>a</sup>
	Rural	56.7 (17)	20.0 (7)	
Most working position	Sitting	80.0 (24)	54.3 (19)	0.490 <sup>a</sup>
	Standing	20.0 (6)	34.3 (12)	
	Walking	-	11.4 (4)	

(**Abbreviation Legend**, SSC = Secondary School Certificate; HSC = Higher Secondary Certificate); (a, Pearson Chi-square test)

**Table 3.** Inter group analysis of pain intensity of the participants after treatment (Mann-Whitney U test)

Numeric Pain Rating Scale	Experimental Median (IQR)		Control Median (IQR)		p
	Baseline	After treatment	Baseline	After treatment	
Pain right now	7 (5 to 8)	3 (2 to 3.25)	6 (5 to 8)	3 (2 to 4)	0.001*
Usual Pain in last week	8 (6 to 9)	2 (2 to 3)	5 (4 to 6)	3 (3 to 5)	0.001*
Best level of pain in last week	6 (5 to 8.25)	1 (1 to 2)	4 (3 to 5)	2 (2 to 4)	0.001*
Worst pain in last week	8 (7 to 8.25)	5 (4 to 5)	8 (7 to 9)	5 (4 to 7)	0.001*

(\* significant at 95% confidence level)

**Table 4.** Intra group analysis of pain intensity of the participants (Wilcoxon Signed Rank Test)

Numeric Pain Rating Scale	Experimental		Control	
	z	p	z	p
Pain right now	4.668	0.001*	4.647	0.001*
Usual Pain in last week	4.569	0.001*	5.117	0.001*
Best level of pain in last week	4.557	0.001*	5.042	0.001*
Worst pain in last week	4.762	0.001*	4.654	0.001*

(\* significant at 95% confidence level)

**Table 5.** Inter group analysis of disability index of the participants after treatment (Mann-Whitney U test)

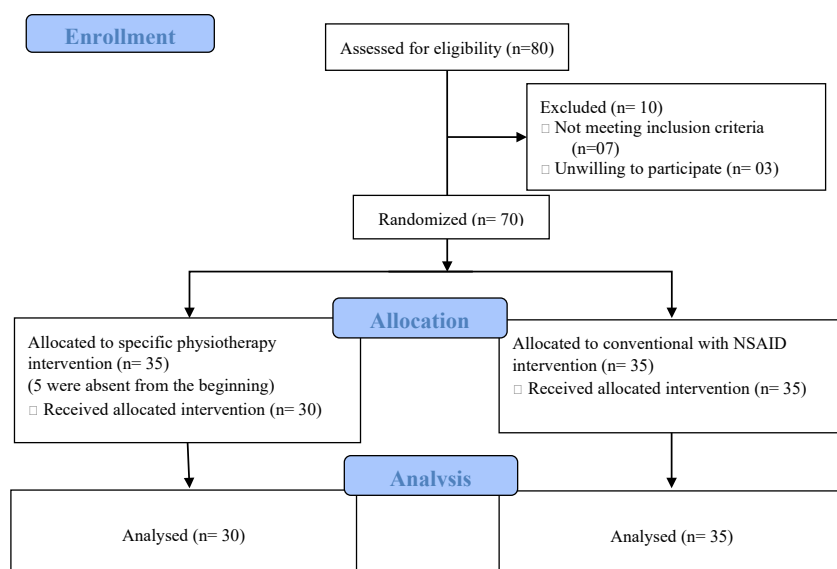
Oswestry Low Back Pain Disability Index	Experimental Median (IQR)		Control Median (IQR)		p
	Baseline	After treatment	Baseline	After treatment	
	29 (26 to 31)	14 (12 to 19)	27 (24 to 29)	19 (14 to 21)	0.002*

(\* significant at 95% confidence level)

**Table 6.** Intra group analysis of disability index of the participants (Wilcoxon Signed Rank Test)

Oswestry Low Back Pain Disability Index	Experimental		Control	
	z	p	z	p
	5.092	0.001*	4.788	0.001*

(\* significant at 95% confidence level)



**Figure 1.** Consolidated Standards of Reporting Trials (CONSORT) flowchart of the study

components of treatment that fall under the regional approach. The research showed that the treatment approaches were effective during a shorter period of time; however, additional research is required to determine the therapies' effects over a longer period of time.

## 6. Conclusion

In the rehabilitation of individuals who suffer from lower back pain, it is evident that specialised physiotherapy treatment has inflicted superior outcomes in terms of minimising pain intensity and improving functional activity than conventional treatment with NSAID. However, certain physiotherapy activities led to a better improvement in the patient's impairment, discomfort, and flexibility. These exercises focused on core stability, strengthening, stretching, posture, and the intentional use of core muscles to stabilise the lumbo-pelvic area.

## Author contributions

S.K.D, A.H.K, M.S.I, N.A, M.N, M.J.A, T.R, A.A.S, P.R.H, and A.K.P conceptualized the study, collected data, and prepared the manuscript.

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## Competing financial interests

The authors have no conflict of interest.

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