

# Chronic Low Back Pain and its Sustainable Management by Using Core Strengthening Exercise and Mechanical Traction

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## Abstract

This experimental study was conducted to determine the effectiveness of neural mobilization and conventional physiotherapy technique in patients with chronic low back pain with a sample of 100. The study reveals that the mean age of the core muscle strengthening group was  $33.88 \pm 10.77$  years whereas mechanical traction group was  $42.46 \pm 9.51$  years of age. Study shows that mean BMI of core muscle strengthening group and mechanical traction group was  $24.05 \pm 4.329$  and  $25.28 \pm 4.562$ . Study found that the mean severity of pain before treatment was  $6.380 \pm 0.725$  and after treatment was  $2.74 \pm 0.921$  of core muscle strengthening and the mean severity of pain before treatment was  $7.100 \pm 0.839$  and after treatment was  $3.64 \pm 1.173$ . Study shows that mean score Oswestry low back pain disability index of core muscle strengthening before treatment was  $20.54 \pm 3.7$  and after treatment was  $7.94 \pm 3.419$ , compare to mechanical traction before treatment was  $22.88 \pm 3.127$  and after treatment was  $11.92 \pm 4.004$ . There was statistically highly significant findings of core muscle strengthening and mechanical traction where t-value was 35.665 and 26.938 which was measured by Universal pain Assessment Tool, another statistically highly significant finding of core muscle strengthening and mechanical traction where t-value were 21.995 and 19.039 which was measured by Oswestry low back pain disability index.

**Key words:** chronic low back pain; core strengthening exercise; mechanical traction

## Introduction

Low back pain that lasts at least one day and limits activity is a common complaint [1]. Globally, about 40% of people have LBP at some point in their lives [1], with estimates as high as 80% of people in the developed world [2]. Approximately 9 to 12% of people have LBP at any given point in time, and nearly one quarter report having it at some point over any one-month period [3]. Difficulty most often begins between 20 and 40 years of age [4] Low back pain is more common among people aged 40-80 years, with the overall number of individuals affected expected to increase as the population ages [1]. Bangladesh is a developing country and the industrialization process is also getting momentum. Now a day, various types of mechanical problems are increasing due to rapid industrialization and mechanization. Chronic low back pain is one of them and it causes a great economic burden on individuals, communities and governments. Chronic low back pain has high prevalence of other musculoskeletal disorders in many developed countries. For persistent chronic low back pain usually continue to have moderate pain and disability. People at higher risk of long-term disability include those with poor coping skills or with fear of activity those with a poor ability to cope with pain, functional impairments, poor general health, or a significant psychiatric or psychological component to the pain. Core muscle

strengthening and mechanical traction play a key role in improving pain relief, range of motion as well as functional activities of chronic low back pain patient. This study- chronic low back pain and its sustainable management by using core muscle strengthening exercise and mechanical traction would offer the best hope for identification of the problems, develops new tools, take necessary steps to minimize suffering of this disorders.

## Methods

**Study design:** It was an experimental study.

**Outcome measure:** Pain and disability index

**Parameter:** Universal Pain Assessment Tool and Oswestry Low Back Pain Disability Index

**Sample population:** The sample population was consisted of male and female who complain of chronic low back pain and consult to the physician in two selected hospitals in two different locations.

**Study area:** The study was conducted Protibondi Seba O Sahajyo Kendra, Noakhali and Prime Hospital Ltd, Noakhali.

## Study site

**A. Protibondi Seba O Sahajyo Kendra (PSOSK)**

Location- Noakhali Sadar, Maijdee, Noakhali.

Type of hospital- Physiotherapy, Occupational and Speech therapy based rehabilitation centre, it is a district level government seba Kendra, under the Jatiyo Protibondhi Unnayan Foundation (JPUF), Ministry of Social Welfare, Bangladesh.

Facilities –outdoor facilities

**B. Prime Hospital Ltd.**

Location- Hospital Road, Maijdee, Noakhali.

Number of beds -100

Type of hospital - General hospital

Facilities – Indoor and outdoor facilities, especially well developed in neurology and orthopedic and Physiotherapy.

**Study period**

1<sup>st</sup> July, 2018 to 30<sup>th</sup> October, 2018.

**Sample size:** Researcher took 100 samples for time and fund limitation where 50 sample for core muscle strengthening exercise and rest 50 for mechanical traction.

**Inclusion Criteria**

1. Those who are willing to give consent and participate for interview, irrespective of sex.
2. Clinically diagnosed chronic low back pain patient.
3. Bone muscle nerve and disc related pain is included.
4. Duration of pain must be more than 12 weeks

**Exclusion Criteria**

1. Pathological disease like TB, Tumor and Osteoporotic patients are excluded
2. Those who are mentally and physically handicapped
3. Who refused to participate in interview
4. Immediate surgical intervention of lumber and lower limbs
5. Pregnant mother.

**Sampling technique:** Randomized sampling technique was applied.

**Data collection tools:** A pretested, modified, interviewer administrated, semi-structured questionnaire was used to collect the data.

**Data management and analysis:** After collection of data of the respondents were organized. Data were entered into the computer into a data base in the software package. Statistical package for the social science (SPSS) Version 16.0 (Polar engineering and consulting, Chicago) using descriptive statistics such as frequency, distribution, range, mean, and percentage. All scores and percentages was computed and presented in tabular form, charts, and graphs as appropriate. Further it was analyzed with the help of chi-square test and p-value. Finally the data were interpreted on the basis of study findings.

**Ethical consideration:** Prior to the commencement of this study, the research protocol was approved by the research committee of the academic institution. The aims and objectives of the study along with its procedure, risks and benefits were explained to the respondents in easily understandable local language and then informed consent was taken from each. Then it was assured that all information and records will be kept confidential and used only for research purpose.

**Results**

Age in years	Neural mobilization		Conventional physiotherapy	
	Frequency	Percentage	Frequency	Percentage
<25	4	8	5	10
26-35	10	20	10	20
36-45	14	28	15	30
46-55	13	26	11	22
56-65	6	12	6	12
>66	3	6	3	6
Total	50	100	50	100
Mean ± SD	43.70±1.354		43.10±1.404	

**Table 1:** Distribution of respondents by age (n=100)

The table 1 reveals that the mean age of the respondents were 43.70 ± 1.354 years with a range from 16 to 74 years. It is found from table 1 that 28% , 26%, 20%,12%,8%,6% of the respondents belonged to age group 36-45years, 46-55 years, 26-35 years, 66-65 years ,<25 years, >66 years and above respectively of neural mobilization technique compare to conventional physiotherapy technique mean age of the respondents 43.10

± 1.404 years with a range from 17 to 73 years. That 30%, 22%, 20%,12%,10% and 6% of the respondents belonged to age group 36-45years, 46-55 years, 26-35 years, 66-65 years ,<25 years, >66 years and above respectively.

Study group	Mean		t-Value
	Pre test	Post test	
Neural Mobilization	7.52±1.669	2.16±2.637	15.646
	7.62±1.614	3.58±2.572	
Conventional Physiotherapy	7.62±1.614	3.58±2.572	13.802
	7.62±1.614	3.58±2.572	

**Table 2:** Distribution of respondents by paired t- test was measured by pain intensity Paired t-test

Table 2 shows that, t-value was 15.646 which were greater than tabulated t-value 3.496 that was statistically highly significant findings of neural

mobilization which was measured by Universal pain Assessment Tool, compare to conventional Physiotherapy technique, t-value was 13.802

which were greater than tabulated t-value 3.496 that was statistically highly significant findings which was measured by Universal pain Assessment Tool.

Study group	Mean		t-Value
	Pre test	Post test	
Neural Mobilization	22.72±8.251	7.56±7.340	13.698
	22.46±7.619	11.70±8.342	
Conventional Physiotherapy	22.46±7.619	11.70±8.342	13.09
	22.46±7.619	11.70±8.342	

**Table 3:** Distribution of respondents by paired t- test was measured by Osestry Low back pain disability index

Table 3 shows that, t-value was 13.698 which were greater than tabulated t-value 3.496 that was statistically highly significant findings of neural mobilization which was measured by Osestry Low back pain disability index, compare to conventional Physiotherapy technique, t-value was

13.09 which were greater than tabulated t-value 3.496 that was statistically highly significant findings which was measured by Osestry Low back pain disability index.

Sex	Neural mobilization				p-value	Conventional physiotherapy				p-value
	Severity of pain (before treatment)			Total		Severity of pain (before treatment)			Total	
	4-6	7-9	10			4-6	7-9	10		
Male	12	15	5	32	.040	13	16	6	35	.141
Female	3	10	5	18		3	8	4	15	
Total	15	25	10	50		16	24	10	50	

p value obtained from Pearson Chi-square ( $\chi^2$ ) test

**Table 4:** Distribution and association of respondents between sex and severity of pain (before treatment)

The table no. 4 finds that p- value was 0.040 which was less than 0.05 that was statistically significant association between age sex and severity of pain of neural mobilization technique compare to conventional

physiotherapy technique , p- value was 0.141 which was more than 0.05 that was no significant association between sex and severity of pain (before treatment).

Sex	Neural mobilization					P-value	Conventional physiotherapy					P-value
	Severity of pain (before treatment)				Total		Severity of pain (before treatment)				Total	
	0	1-3	4-6	7-10			0	1-3	4-6	7-10		
Male	11	19	1	1	32	.018	4	18	9	4	35	.011
Female	5	6	4	3	18		0	5	6	4	15	
Total	16	25	5	4	50		4	23	15	8	50	

p value obtained from Pearson Chi-square ( $\chi^2$ ) test

**Table 5:** Distribution and association of respondents between sex and severity of pain (After treatment)

The table no. 5 finds that p- value was 0.018 which was less than 0.05 that was statistically significant association between age sex and severity of pain (After treatment) of neural mobilization technique compare to conventional physiotherapy technique, p- value was 0.011 which was less than 0.05 that was significant association between sex and severity of pain (after treatment).

24% were housewife, 16% were business, 10% were student, 10% retired person and 2% were workers respectively. These findings were dissimilar to the study carried out by Olson PR et.al.editors [7]. Study conclude that both chronic low back pain and its sustainable management by using core muscle strengthening exercise and mechanical traction brings significant improvement in patient with chronic low back pain. This study shows a relevant improvement in different functional level, decrease pain and lumbar disability by two therapeutic interventions. This preliminary study had a number of limitations. The experimental study was risk for the respondents. The sample size was comparatively small due to shortage of time and financial constraints of the research period and thus the result could not be generalized.

**Discussion and conclusion**

The study reveals that the mean age of the respondents were 43.70 ± 1.354 years. It is found that 28% , 26%, 20%,12%,8%,6% of the respondents belonged to age group 36-45years, 46-55 years, 26-35 years, 66-65 years ,<25 years, >66 years and above respectively of neural mobilization compare to conventional physiotherapy mean age of the respondents 43.10 ± 1.404 years, 30%, 22%, 20%,12%,10% belonged to age group 36-45years, 46-55 years, 26-35 years, 66-65 years ,<25 years, >66 years and above respectively. These findings were similar to the study carried out by Beales DJ et.al.editors, Pahor S et.al.editors [5, 6]. It is found from that 38% of the respondents were service holder, 26% housewife, 12% student, 8% retired person and only 2% were workers respectively of neural mobilization technique compare to conventional physiotherapy technique, 38% of the respondents were service holder,

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