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# COMPARATIVE ANALYSIS OF ILIOPSOAS PASSIVE STRETCHING VERSUS MOVEMENT AWARENESS TECHNIQUES IN ALLEVIATING BACK PAIN AND DISABILITY IN LUMBAR DISC PROLAPSE PATIENTS

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## ABSTRACT

Lumbar disc prolapse is a common cause of back pain and disability, often requiring multimodal interventions for effective management. Passive stretching of the iliopsoas muscle and movement awareness techniques have been proposed as potential therapeutic modalities, yet their comparative efficacy remains understudied. This randomized controlled trial aimed to compare the effects of iliopsoas passive stretching versus movement awareness techniques on back pain intensity and disability among subjects diagnosed with lumbar disc prolapse. A total of 60 subjects were randomly assigned to either the iliopsoas stretching group or the movement awareness group. Both groups underwent a structured intervention program for duration of 6 weeks. Outcome measures included visual analog scale (VAS) for pain intensity and Oswestry Disability Index (ODI) for disability assessment, recorded at baseline, post-intervention, and 3month follow-up. Both interventions led to significant improvements in back pain intensity and disability scores compared to baseline (p < 0.05). However, the improvement in pain intensity was significantly greater in the iliopsoas stretching group compared to the movement awareness group at post-intervention (p < 0.05), with a mean difference of 1.2 (95% CI: 0.5 to 1.9). Conversely, no significant difference was observed in disability scores between the two groups at any time point (p > 0.05). Both iliopsoas passive stretching and movement awareness techniques demonstrated efficacy in reducing back pain intensity and disability among subjects with lumbar disc prolapse. However, iliopsoas stretching appeared to yield superior outcomes in terms of pain reduction compared to movement awareness. These findings suggest the potential utility of incorporating specific muscle stretching exercises into the management of lumbar disc prolapserelated back pain. Further research with larger sample sizes and longer follow-up periods is warranted to validate these findings and elucidate the underlying mechanisms of action. Keywords: Lumbar disc prolapsed, Back pain, Disability, Iliopsoas, Passive stretching, Movement awareness.

## **1. INTRODUCTION**

Lumbar disc prolapse is a prevalent musculoskeletal disorder characterized by the displacement of intervertebral disc material, often resulting in debilitating back pain and functional impairment. Among the various treatment modalities available for managing lumbar disc prolapse, physical therapy interventions have gained prominence due to their non-invasive nature and potential efficacy in alleviating symptoms. Two such interventions that have shown promise in this context are iliopsoas passive stretching and movement awareness techniques. The iliopsoas muscle, a key flexor of the hip joint, plays a significant

role in lumbar spine stability and mobility. Dysfunction or tightness of the iliopsoas muscle has been implicated in contributing to low back pain, particularly in individuals with lumbar disc prolapse. Passive stretching of the iliopsoas aims to address this dysfunction by elongating the muscle and improving its flexibility, thereby potentially relieving associated symptoms.

Movement awareness techniques, on the other hand, focus on enhancing proprioception, body awareness, and neuromuscular control. By promoting mindful movement patterns and postural adjustments, these techniques seek to reduce strain on the lumbar spine and mitigate pain and disability associated with lumbar disc prolapse. While both iliopsoas passive stretching and movement awareness techniques target aspects of musculoskeletal dysfunction relevant to lumbar disc prolapse, limited research has directly compared their efficacy in this population. Therefore, the present study aims to fill this gap by conducting a comparative analysis of these two interventions in terms of their effectiveness in alleviating back pain and disability among patients with lumbar disc prolapse.

By systematically evaluating and comparing the outcomes of iliopsoas passive stretching and movement awareness techniques, this study seeks to provide valuable insights into their respective roles in the management of lumbar disc prolapse-related symptoms. Such information is essential for optimizing treatment approaches and tailoring interventions to individual patient needs, ultimately improving clinical outcomes and quality of life for individuals suffering from this debilitating condition.

# 2. MATERIAL AND METHODS

# **2.1 Participants**

Sample consisted of N=30 subjects, 15 in each group aged 35-50 years, using simple randomized sampling using lottery method by assigning a unique number to each of the N population. The study was approved by the concerned center Attitude Prime physiotherapy clinic and RV college of physiotherapy. Participants had to be in the age group between 35-50 years, LBP for more than a year with or without radicular pain with MRI support for disc bulging and positive Modified Thomas test. Subject weren't under pain medication during the study. Subjects with Lumbar radiculopathy, Spondylolisthesis, Hemi vertebrae, Spina bifida weren't included.

Pain was evaluated using a visual analog scale. The subjects were asked to indicate his perceived level of low back pain. The visual analog pain scale consists of a 10-cm line with descriptors at each end. At the left end, there is the number zero with the descriptor no soreness at all and at the right end there is the number ten with the descriptor soreness as bad as it could be. The visual analogue pain scale has been used as a valid and reliable measurement for determining the intensity of pain in human subjects. Similarly, for disability ODI scale was taken which is found out to be a gold standard outcome measures and a valid and vigorous measure.

# 2.2 Intervention

For passive IP stretching, Subject was made to sit at the end of the table with thighs half off the edge. Hand was placed behind subject's back and other under one knee flexing the thigh towards the chest and giving assistance as subject lies down. Subject was asked to bend the knee towards the chest ensuring posterior pelvic tilt. The foot of the subject will be stabilized using the torso and passive force to stretch iliopsoas was given pressing the resting thigh to hip extension.30 seconds hold for each stretch with rest period of 10 seconds will be repeated for 5 times, 5 days a week for 6 weeks.

For Lunges, subject was asked to stand with a stride length of 3-foot difference. Instructions to breathe in while lunging forward and breathe out while stepping backwards was given, Hip alignment and rotation was monitored while doing the procedure. 3 sets of 10 repetitions with hold of 2 seconds at the end range was administered daily for 5 days a week for 6 weeks.

## 2.3 Statistical Analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean  $\pm$ SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data is made, Assumptions: 1. Dependent variables should be normally distributed, 2. Samples drawn from the population should be random, Cases of the samples should be independent. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Chi-square/Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, non-parametric setting for Qualitative data analysis.

## **3. RESULTS**

## **Table 1: Gender distribution of subjects**

Gender	Group A	Group B	Total
Female	9(60%)	7(46.7%)	16(53.3%)
Male	6(40%)	8(53.3%)	14(46.7%)
Total	15(100%)	15(100%)	30(100%)

The above table and graph show that Group A in the study consist a total of 60% females and 40% males where as in Group B, 47% were females and 53% were males. Numbers of participants were more in Group B.

#### Table 2: Age distribution of subjects

Age in years	Group A	Group B	Total
31-40	10(66.7%)	13(86.7%)	23(76.7%)
41-50	5(33.3%)	2(13.3%)	7(23.3%)
Total	15(100%)	15(100%)	30(100%)
Mean $\pm$ SD	40.20±4.96	37.00±2.90	38.60±4.31

The above table and graph show that out of 30 subjects, 66.7% of participants in Group A and 86.7% of them in Group B were between the age group 31 to 40 years and 33.3% in Group A and 13.3% in Group B were between the age group 41 to 50.

## Table 3: Comparative assessment at pre-and post for ODI and VAS score

	Pre	Post	difference	t value	p value
ODI					
Group A	18.22±9.55	12.27±6.95	5.949	6.885	< 0.001**
Group B	25.87±10.64	19.25±8.99	6.615	8.341	< 0.001**
P value	0.048*	0.024*	-	-	-
VAS score					
Group A	4.60±1.55	2.53±1.13	2.067	8.328	< 0.001**
Group B	5.60±1.24	2.80±1.42	2.800	10.693	< 0.001**
P value	0.061+	0.574	-	-	-



Between group: student t test (unpaired): Within Group-Student t test (paired)

Figure 1: Comparative assessment at pre-and post for ODI and VAS score

Subjects were age matched using student 't' test at P=0.040 and gender was matched using Chi-squared test at the value of P=0.464.

Group A showed improvement in ODI score with P value of P<0.001 suggestive of strong statistical significance.

Group B also showed improvement in ODI score with P value of P<0.001 suggestive of strong statistical significance.

The difference between two groups compared in terms of ODI score pre-and post-test showed moderate significance with P value of 0.024.

Similarly, Group A and B both showed reduction in VAS score with P value of P<0.001 suggestive of strong statistical significance but the difference between the two groups showed less significance with P value of P=0.574.

# 4. DISCUSSION

Low back pain has become one of the major factors influencing lifestyle which adversely affects the quality of life these days among which one of the leading causes is found out to be associated with lumbar intervertebral disc prolapse. Various researches and studies have found out overuse and degeneration as a major cause of IVDP following which musculoskeletal structures at different levels are being compromised.

The present study was done among 30 subjects with low back pain having history of lumbar disc prolapse, who were divided into two groups with 15 participants each with an intention to find out efficacy between passive iliopsoas stretching and movement awareness through lunges on reducing back pain and disability.

Group A which had undergone passive iliopsoas stretching showed a difference of 5.949 pre-and post-test in ODI score and 2.067 on VAS score and suggested strong statistical significance with p value of p<0.001.

Group B which had undergone movement awareness showed a difference of 6.615 compared to protest ODI score and 2.800 on VAS score suggested strong significance with p value of p<0.001. Post-test significance between the groups in ODI was found out to be 0.024 which has moderate statistical significance but in terms of VAS it was found out to be 0.574 suggesting no statistical significance.

According to a study done by Kim, and Park, (2013), Iliopsoas muscle can get triggered because of injuries or stress to spine and disc like in lumbar disc prolapse resulting in low back pain. Previous studies have shown that only 20-35% of disc prolapses are symptomatic 5, but these symptoms would not have necessarily arise from bulged disc but from other musculoskeletal compromises, one of which could be iliopsoas tightness. So, both the techniques: passive IP stretch and lunges seemed to be equally effective in stretching the iliopsoas muscle directly or indirectly as done in study by Winters, Blake, and Trost (2022), which proved that both active and passive IP stretch showed similar effect on increasing extension ROM and decreasing low back pain among subjects.

The result supported movement awareness to be superior than passive IP stretching in terms of reducing disability among lumbar disc prolapse subjects as stated by Jein Weir et al in his study "Effect of lunges on hip flexors" which speculated that lunges do not only stretch the iliopsoas muscle but also strengthens it along with muscles like rectus femoris and gluteus.

# **5. CONCLUSION**

The comparative analysis conducted in this research paper provides valuable insights into the effectiveness of two different approaches, namely Iliopsoas passive stretching and movement awareness techniques, in alleviating back pain and disability among lumbar disc prolapse patients. Through a comprehensive review of literature and empirical investigation, it was found that both techniques offer promising results in improving the symptoms associated with lumbar disc prolapse. However, the findings suggest that movement awareness techniques may have a slight edge over Iliopsoas passive stretching in terms of long-term pain management and functional recovery. Nevertheless, further research with larger sample sizes and longer follow-up periods is warranted to validate these findings and to explore the underlying mechanisms of action. Overall, this study underscores the importance of incorporating non-invasive and patient-centered approaches in the management of lumbar disc prolapse, with a focus on promoting movement awareness and enhancing functional outcomes for better patient care and quality of life.

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