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EFFECT OF MCKENZIE EXERCISES ON LOW BACK PAIN IN FEMALES

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ABSTRACT

Introduction: Most of the people experience an episode of LBP at some instance in their lifetime and the prevalence is higher in females than males. A variety of Physical therapy protocols for low back pain are practiced. In this study effectiveness of McKenzie exercises on women experiencing low back pain is investigate. **Objectives:** The objective of this study was to find out the effectiveness of McKenzie exercises on low back pain in females. **Study design:** It was a quasi experimental study **Setting:** Data was taken from Physiotherapy department of Jinnah Hospital Lahore and was compiled at Riphah International University Lahore **Period:** Study was completed in 5 months after approval of synopsis from July to November 2014. **Material & Methods:** This quasi experimental study was conducted at Physiotherapy department of Jinnah Hospital Lahore. 48 patients diagnosed with low back pain fulfilling inclusion criteria were taken. Informed consent was taken and then demographic information (like name, age, etc) was obtained. Patients were divided into two study groups. Group A were treated with McKenzie exercises and group B were not treated with McKenzie exercises. The baseline treatment for both the cases was heat therapy using hot pack. **Results:** Difference in the means of baseline and after treatment pain score of McKenzie and non McKenzie groups was 0.042 which was not statistically significant (P-value=0.915). Activity score on PSFS was improved in both McKenzie and non McKenzie groups. But the difference in the means of activity score of two groups was not statistically significant at the 5% level of significance. (P value=0.162). **Conclusion:** McKenzie exercise for the treatment of low back pain in females does not make any appreciable improvement in symptoms like severity of pain when compared with heat therapy alone. McKenzie exercises improve the level of functional activities but it is not statistically significant.

Keywords: Low back pain, McKenzie exercises.

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INTRODUCTION

Low back pain is a common health as well as socioeconomic problem in developed countries. It is usually defined as pain located between the twelfth rib and the inferior gluteal folds. It can be associated with leg pain. Back pain is classified as acute: if it lasts less than six weeks, subacute: if it persists for six weeks to three months and chronic: when it lasts for more than three months.[1] Mostly back pain symptoms are nonspecific, meaning that there is no associated systemic disease.[2] Psychological factors may contribute to the occurrence of low back pain and should be considered during the examination.[3]

Most of the people experience an episode of LBP at some instance in their lifetime. The prevalence of LBP is more in females than in males of age between 21 and 44 years. Incidence of LBP has increased over last two decades in all populations. This has led to increased level of disability and more number of patients seeking health care and consulting health care professionals.[4] The usual pattern of low back pain

is considered as either spontaneous recovery, however 3-10% of cases become chronic, or it can be recurrent where majority of cases complain of pain after a period of one year.[5]

The occupational factors having association with low back pain are direct impact, lifting and transfers, low job latitude and low level of job satisfaction. The prevalence is greater in respondents having more load of work. No significant association is found between low back pain and factors like gender, age, experience in a particular profession, smoking and routine exercise.[6]

Lifestyle factors like body weight can also be associated with LBP.[7]

Exercise therapy includes a heterogeneous group of interventions. Uncertainty exists about the most effective exercise approach in low back pain.[8]

McKenzie Exercises:

The McKenzie protocol is a categorical system for the mechanical diagnosis and treatment of low back pain. This protocol consists of examination, treatment and prevention. Direction preference is determined by repetitive movements in the direction of pain relief. This is called centralization of pain. This helps in the selection of specific McKenzie exercises. Low back pain is classified into any of the following categories according to the symptoms: derangement syndrome, dysfunction syndrome or postural syndrome.

Exercises are repeated several times in the determined direction to reduce severity and extent of pain. Patients are guided about the importance of compliance with the exercises.

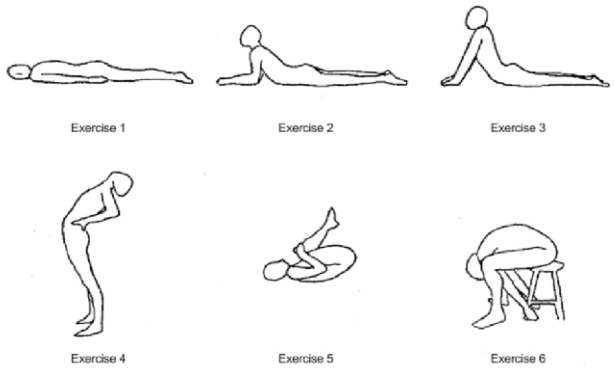
Following principles are applied for the selection of McKenzie exercises:

- Kyphotic antalgic management: extension principle
- Acute lordotic antalgic management: Flexion principle
- Acute coronal antalgic management: side flexion then extension principle

Examples of McKenzie Exercises:

Exercise 1: Prone Lying
Exercise 2: Lumbar Extension in prone lying
Exercise 3: Prone lying on elbow
Exercise 4: Lumbar extension in standing
Exercise 5: Lumbar flexion in supine lying
Exercise 6: Flexion in sitting
Exercise 7: Flexion in standing[9]

Figure-1: Examples of McKenzie Exercises



The objective of this study was "to see the effect of McKenzie exercises on low back pain in females"

MATERIALS AND METHODS

Study design:

It was a quasi experimental study.

Setting:

Data was taken from Physiotherapy department of Jinnah Hospital Lahore and was compiled at Riphah International University Lahore.

Sampling Technique:

Non-probability, convenience sampling technique was used.

Study Groups:

- **Group A:** In this group patients receiving McKenzie exercises were taken.
- **Group B:** In this group patients not receiving McKenzie exercises were taken.

Sample Size:
48 cases of low back pain were taken, 24 in each group, using low back pain mean ± standard deviation on numeric pain rating scale 6.6 ± 1.8 SD and 6.6 ± 1.9 SD in two groups with 95% level of confidence and 5% margin of error.[10]

Duration of Study:
Study was completed 3 months after the approval of synopsis.

Sample Selection Criteria:

Inclusion criteria:
- Females complaining low back pain
- Aged 25-40 years

Exclusion criteria:
- Pregnant females
- Females having history of recent back trauma, fracture, tumor, infections and chronic or systemic inflammatory disease

Data Collection Tools and Outcome Measures
Patients were assessed through an eleven points "Numeric Pain Rating Scale", '0' meant no pain while '10' depicted worst pain imaginable, and "Patient Specific Functional Scale" at the initial assessment and after a week of treatment. All information was kept in a Performa attached.

Working Procedure
All 48 patients diagnosed with low back pain fulfilling inclusion criteria from Jinnah Hospital were taken. Informed consent was taken and then demographic information (like name, age, etc.) was obtained. Patients were divided into two study groups. Group A were treated with McKenzie exercises and group B were not treated with McKenzie exercises. The baseline treatment for both the groups was heat therapy using hot pack.

Statistical Analysis
All collected data was organized and analyzed by computer program SPSS version 20. Mean ± standard deviation were calculated for quantitative variables while frequency (%) was used for qualitative variables. Independent sample t-test was used to compare means between groups. P-value $\leq$ 0.05 was considered as significant.

RESULTS

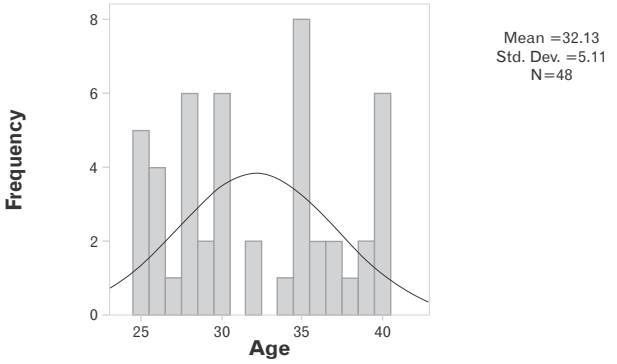


Figure-2: Illustration of Frequency Distribution of Age of Respondents

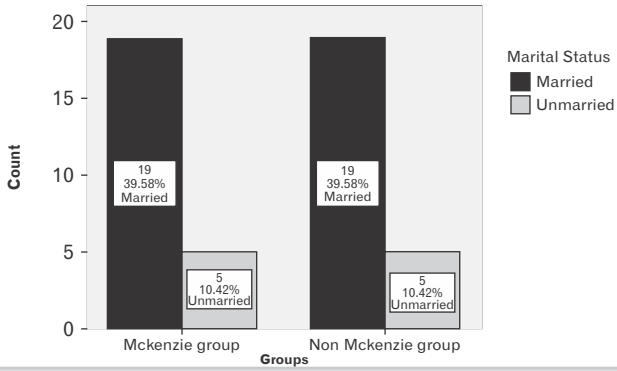


Figure 3. Graphical Representation McKenzie and Non McKenzie Groups and Marital Status

Table 1. Case Summary of Score of Pain on Numeric Pain Rating Scale

Groups		Baseline Score of Pain	Score of Pain after Treatment
McKenzie Group	Frequency	24	24
	Mean	8.21	5.25
	SD	1.141	1.422
Non McKenzie Group	Frequency	24	24
	Mean	7.54	4.54
	SD	1.285	1.693

Table 2. Difference in Means of Baseline Score of Pain and Score of Pain after Treatment in McKenzie and Non McKenzie groups

	Groups	N	Mean	SD	SEM
Difference of Baseline and after treatment pain	**McKenzie group**	24	2.95	1.517	.310
	Non McKenzie group	24	3	1.142	.233

Difference of baseline pain & after treatment pain	Levene's test for equality of variances		t-test for equality of means						
								95% CI of Diff.	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	SE diff.	lower	upper
	1.425	.239	-.107	46	.915	-.042	.388	-.822	.739

Value of t-test to depict difference of improvement in pain between McKenzie and non McKenzie group was 0.107. Difference in the means of the two groups was 0.042 which was not significant with p value of 0.915.

Table 3. Case Summary of Aggregate of Activity Scores on Patient Specific Functional

Groups		Aggregate of baseline score of activity	Aggregate of activity score after treatment
McKenzie Group	Frequency	24	24
	Mean	12.96	26.21
	SD	4.759	5.540
Non McKenzie Group	Frequency	24	24
	Mean	16.83	28.29
	SD	5.685	6.893

Table 4. Difference in Means of Aggregate of Baseline Score of Activity and Aggregate of Score after Treatment in McKenzie and non McKenzie groups

	Groups	N	Mean	SD	SEM
Difference of aggregate of baseline & after treatment score of activity	**McKenzie group**	24	13.25	4.523	.923
	Non McKenzie group	24	11.45	4.191	.855

Difference of aggregate of baseline and after treatment score of activity	Levene's test for equality of variances		t-test for equality of means						
									95% CI of Diff.
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	SE diff.	lower	upper
	.056	.813	1.423	46	.161	1.792	1.259	-.742	4.325

The p value is 0.161, and, therefore the difference between the two means is not statistically significantly different from zero at the 5% level of significance. There is estimated change of 1.8% (SE=1.26%). However, there is insufficient evidence (p=0.161) to suggest that McKenzie exercises do not change the mean activity score on patient specific functional scale.

Table 5. Case Summary of Average of Activity Scores on Patient Specific Functional Scale

Groups		Average of baseline score of activity	Average of activity score after treatment
McKenzie Group	Frequency	24	24
	Mean	2.713	5.454
	SD	1.0343	1.1960
Non McKenzie Group	Frequency	24	24
	Mean	3.533	5.962
	SD	1.0833	1.2792

Table 6. Difference in Means of Average of Baseline Score of Activity and Average Score after Treatment in McKenzie and non McKenzie groups

	Groups	N	Mean	SD	SEM
Difference of Baseline & after treatment average score of activity	**McKenzie group**	24	5.454	1.1960	2.2441
	Non McKenzie group	24	5.962	1.279	.2611

Difference of Baseline and after treatment average score of activity	Levene's test for equality of variances		t-test for equality of means						
									95% CI of Diff.
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	SE diff.	lower	upper
	174	.678	1.422	46	.162	.5083	.3575	-1.228	.2112

The p value is 0.162, and, therefore the difference between the two means is not statistically significantly different from zero at the 5% level of significance. There is estimated change of 0.508% (SE=0.358%). However, there is insufficient evidence (p=0.162) to suggest that McKenzie exercises do not change the mean activity score on patient specific functional scale.

DISCUSSION

The purpose of this study was to determine the effect of McKenzie exercises in the treatment of low back pain in females. Patients were randomly divided into two groups. Group A was treated with McKenzie exercises, in addition to heat therapy, for a period of one week. While group B was treated with heat therapy alone for a period of one week. Short term effects of McKenzie exercises were noted in terms of pain and improvement in activity level.

The study suggests that great improvement in pain was noted in both the groups which was greater than the clinically significant value that is 30%.() Similarly pain in non McKenzie was also decreased after treatment. However no statistically significant difference in pain was noted between the two groups.

Activity score on PSFS was also improved in both McKenzie and non McKenzie groups. But the difference in the means of activity score of two groups was not statistically significant.

A study showed no remarkable difference in the two groups after six weeks."[12] In another study McKenzie protocol was proven better than just patient education in various terms.[13]

Treating the patients with McKenzie exercises in addition to the heat therapy can be worthwhile in order to improve the level of functional activities of daily routine.

McKenzie exercises are self administered, however physiotherapists applying McKenzie exercises in the study did not undergo certified training for the application of McKenzie exercises. Other studies also support the results of this study that McKenzie exercises do not provide substantial gains in management of LBP when compared to other treatment options.

This study has strength as investigating the effect of McKenzie exercises on LBP in females in addition to heat therapy is not common in literature. Information provided in this study can help in the clinical practice. Patient's adherence to the treatment was quite satisfactory and there was no loss of follow up.

In concluding the results it should be taken in consideration that during the study neither the participants nor the physiotherapists were blinded while deciding the treatment groups. Such lack of blindness can affect the subjective outcome measures like pain and functional status. One limitation was the small sample size; estimates of results after treatment in the study were not precise specially while calculating difference in pain improvement between the two groups as depicted by broad confidence interval. No outcome related to long term follow up was measured and measurement of only short term follow up of one week limited the worthiness of this study.

CONCLUSION

A treatment regimen comprising of McKenzie exercise for the treatment of low back pain in females does not make any appreciable improvement in symptoms like severity of pain when compared with heat therapy. McKenzie exercises improve the level of functional activities but it is not statistically significant. Further research needs to be done on long term effects of McKenzie exercises on low back pain in females.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Sahar Aslam	Principal investigator	
2	Masooma Gull	Help in Literature searching