

Effect of Strengthening Exercises in Psychometric Qualities in Non - Specific Back Pain

Mehwish Manzoor Khan¹, Paramjeet Kaur², Kavita Kaushal³

¹B.PT Intern, College of Physiotherapy, Adesh University, Bathinda (Punjab)

²Assistant Professor, College of Physiotherapy, Adesh University, Bathinda (Punjab)

³Principal, Professor, College of Physiotherapy, Adesh University Bathinda (Punjab)

Abstract: *Background:* Non-specific back pain remains the second most common symptom related reason for seeing a physician. The term “non-specific” indicates that no precise structure has been identified causing the pain. It includes common diagnosis, such as myofascial syndromes, muscle spasms, mechanical back pain, back sprain and back strain. *Design:* An Observational Study. *Method:* The Study sample included 30 subjects of age group 25- 40 years. Subjects were then asked to sign the Consent form and gave their will regarding being enrolled in the study. Subjects were made to perform Strengthening exercises. All the patients received total intervention for 5 days per week. The patients were assessed at baseline and after every week for 3 weeks. *Results:* After statistical analysis, a significant improvement was found more in FRI than NPRS. The level of improvement ($p < 0.05$) was significantly high with FRI than NPRS. *Conclusion:* The present study has concluded that strengthening exercises are effective in psychometric qualities in non- specific back pain. As FRI and NPRS was used in this study and when there result was co-related it was found that FRI is more significant than NPRS.

Keywords: Non-specific Back Pain, Numerical Pain Rating Scale, Functional Rating Index, Strengthening Exercises, Psychometric Qualities

1. Introduction

Back pain is a common problem that causes substantial economic, social and psychological stresses for both the community and the individual.^[1] Back pain became one of the biggest problems for public health systems in the western world during the second half of the 20th century, and now seems to be extending worldwide.^[2] Back pain is the most common and troublesome complaint, its exact cause and an exact diagnosis is often difficult^[3]. Back pain influences quality of life and causes physical and psychological distress. The consequences of back pain are far reaching and lead to a negative economic impact, which includes an increased absence from work and lost productivity^[4].

The most used classification for back pain by clinicians is “specific” or “non-specific” back pain. A specific back pain (about 1-2% of all patients with early back pain) is attributed to back pain due to any systemic disease, infection, injury, trauma, caudaequina or structural deformity. The term “non-specific” indicates that no precise structure has been identified causing the pain. Non-specific back pain includes common diagnosis, such as myofascial syndromes, muscle spasms, mechanical back pain, back sprain and back strain.^[5]

It is estimated that only 15% of all back pain has an identifiable anatomic explanation. The other 85% is identified as non-specific back pain.^[6]

An epidemiological survey claimed that 30.1% had never experienced back pain, 46.3% were moderate back pain and 23.6% were severe back pain. Of those experiencing low back pain, 30% to 70% will have recurrent episodes and Plowman (1992) claims that there is evidence that 12% to

26% of children and adolescents experience low back pain although most cases of low back pain occur in persons between that ages of 25 and 60 yr, peaking at about 40 yr.^[7]

The main predictors of back pain include physical stress (e.g., prolonged lifting, driving, forceful or repetitive movements involving the back), psychosocial stress (e.g., high perceived workload and time pressure, low control and lack of social support at work), personal characteristics (e.g. psychological status, and tobacco use), and physical characteristics (e.g., obesity and height). Although, these factors represent conditions existing during working life as well as conditions accumulated during the pre work period, most studies focus exclusively on ergonomic and psychosocial working conditions. With a few exceptions, there exists, to our knowledge, almost no research on the contribution to low back pain of pre work experiences in combination with working life factors.^[8]

For acute low back pain, most clinical practice guidelines agree on the use of reassurance, recommendations to stay active, brief education, paracetamol, non-steroidal anti-inflammatory drugs, spinal manipulation therapy, muscle relaxants (as second line drugs only, because of side-effects), and weak opioids (in selected cases).^[9,10] Some reviews recommend topical pharmacological treatments and superficial heat application for pain relief.^[11] Systemic corticosteroids are not recommended for acute low back pain.^[12]

For the management of Low Back Pain there are numerous interventions which includes Physiotherapy, Pharmacology and surgical methods. Physiotherapy includes Electrotherapy and Exercises therapy. Physiotherapists may use Electrotherapy for the management of Low Back Pain which includes Ultrasound, TENS, Moist Heat Therapy, IFT, SWD

etc. and may use Exercise therapy which includes Williams Flexion Exercises, McKenzie Extension Exercises, Lumbar Isometrics, Back School exercises, Strengthening exercises, etc. Physiotherapist may also use Combined Electrotherapy and Exercise therapy for the management of Low Back Pain.^[13] Medications to treat discomfort associated with back pain should be limited to Non-Steroidal Anti-Inflammatory Drugs and, possibly Muscle Relaxants. Narcotics should be avoided as long term treatment of pain associated with back.^[14] Surgical planning for mid back pain is crucial to a successful operation. Posterior arthodesis, osteotomy, spinal instrumentation and fusion for back pain can be an extensive operation with mini spinal segment typically included in the fusion mass.^[15]

2. Research Methodology

Study Design: An Observational Study

Research Setting: Adesh University, Bathinda

Sample Size: 30 Subjects

Sampling Method: Convenient Sampling

Ethical Approval and Consent

Approval was taken for this study from the Institutional Research Committee and Ethical Committee of Adesh University, Bathinda. All the subjects were informed about the nature of the study and written and verbal informed consent was taken.

Sampling Criteria

Inclusion criteria:

- Age group = 25-40 yrs old.
- Both males and females.

Exclusion criteria:

- Any inflammatory condition of back.
- Soft tissue injury of back (sprain or strain).
- Any surgery of back.
- Any pathological condition of back (e.g. tumour).
- History of any trauma.
- Any degenerative changes of back (e.g. ankylosing spondylosis, Osteoarthritis, Osteoporosis).

Variables:

Independent- Strengthening exercises.

Dependent- : NPRS (Numerical Pain Rating Scale), FRI (Functional rating index)

Tools of Data Collection:

- NPRS
- FRI

Procedure

30 Subjects were included in this study after the approval from Institutional Research Committee and Ethical Committee of Adesh University on the basis of selection criteria. Subjects were then asked to sign the Consent form and give their will regarding being enrolled in the study. Subjects were assessed for pain by NPRS and Functional Rating Index respectively. Subjects were assessed at baseline and after the intervals of every 1 week for 3 weeks.

Treatment Protocol

Strengthening exercises: The exercise programme comprised 5 basic exercises aimed at improving postural awareness, strengthening the back extensors and improving extension mobility. The exercises were performed under the supervision of the physical therapist, who provided guidelines (verbal and/or written) to the patients so that they could also perform the exercises alone (at home). Briefly, the exercises comprised:

- 1) Seated, lifting both hands together above the head (3 series of 10–15 movements).^[17]
- 2) Seated or standing with the back against a wall, straightening the back as far as possible (3 series of 10–15 repetitions, maintaining the upright position for 3–10 sec).^[17]
- 3) Seated on a chair with both hands on the neck or crossed over the thorax on the shoulders, lifting the arms and extending the upper back without compensation in the hips or lumbar spine (3 series of 10–15 repetitions, maintaining the upright position for 3–10 sec).^[17]
- 4) Standing in front of a wall, scrolling with both hands as high as possible over the wall (3 series of 10–15 repetitions, maintaining the upright position for 3–10 sec).^[17]
- 5) Lying on the back, knees and hips flexed and feet resting on the ground, a small rolled-up towel under the 5th to 7th thoracic vertebrae (perpendicular to the spinal processes), stretching the thoracic spine for 30–180 sec (depending on the patient's capacities, without compensation of the lumbar spine or eliciting back pain).^[17]
- 6) Lumbosacral motions to be performed; trunk flexion, extension, side bending and straight leg raising.^[16]

3. Results

NPRS	Pre-value	Post- value			f -value	p-value*
		1 st week	2 nd week	3 rd week		
Mean	6.13	5.2	4.26	3.33	32.63	0.05

*p > 0.05 is not significant

*p < 0.05 is significant

Mean of Pre value of NPRS is 6.13 and Post value is 5.2, 4.26 and 3.33 respectively. The f- ratio value is 32.63 at p-value 0.05. Thus, the result shows that it is significant in nature.

FRI	Pre-value	Post- value			f -value	p-value*
		1 st week	2 nd week	3 rd week		
Mean	41.083	28.83	17.3	10.583	48.21619	0.05

*p > 0.05 is not significant

*p < 0.05 is significant

Mean of Pre value of FRI is 41.083 and post value is 28.83, 17.3 and 10.583 respectively. The f-ratio value is 48.21619 at p-value 0.05. The result shows that it is significant in nature.

4. Discussion

The aim of this study was to find the effect of strengthening exercises in psychometric qualities in non-specific back pain. The effect has been studied by the means of clinical evaluation.

As there, were limited studies in the literature which showed the effect of strengthening exercises in psychometric qualities in non-specific back pain. Therefore, present study was focused on it.

Thus, the present study has concluded that strengthening exercises are effective in psychometric qualities in non-specific back pain. As FRI and NPRS was used in this study and when there result was co-related it was found that FRI is more significant than NPRS. Some articles that support this study are as follows.

Swati M and U.V Kiran et al. conducted a study on Posture discomfort due to laptops Among college going students and concluded that significance difference between boys and girls were Observed in posture adopted i.e. Study neck natural, slouching forward, slouching backward and Laying on stomach mostly boys and girls spend more time in academic and work related purpose And very few laptop users use laptop accessories. To reduce the posture discomfort among Students, proper orientation regarding the postures to be used has to be given.

Lizier D T, Perez M V et al conducted a study Exercises for Treatment of Nonspecific Back Pain and the aim of this was to review exercises for non-specific back pain treatment and the findings were to find the most effective types of exercise therapy for chronic or acute low back pain are still controversial; however, exercise therapy is probably the most widely used conservative treatment throughout the world.

Hoy D, Bain C, et al. conducted a study Systematic Review of the Global Prevalence of Back Pain and they concluded as the population ages, the global number of individuals with back pain is likely to increase substantially over the coming decades. Investigators are encouraged to adopt recent recommendations for a standard definition of back pain and to consult a recently developed tool for assessing the risk of bias of prevalence studies.

Olusola et. al. Conducted a study to check Prevalence and Profile of Back pain in Nigerian adolescents and concluded back pain is common among Nigerian adolescent students, but it is mostly mild. The prevalence of back pain increased with advancing age in both genders. More research is needed to find necessary risk factors and interventions including appropriate back education to reduce back pain.

5. Limitations of the Study

Within the context of the study, there exit several limitations that may have affected the results:

- The sample size of study was small.
- Samples were chosen from only one area by using random sampling method.
- Unequal distribution of males and females.

6. Future Scope of the Study

- The study can be done on large number of subjects.
- The study can be done on larger area and region.

- Study can be done on various trades of students other than medical students.

7. Conclusion

The present study has concluded that strengthening exercises are effective in psychometric qualities in non-specific back pain. As FRI and NPRS was used in this study and when there result was co-related it was found that FRI is more significant than NPRS.

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