



TO STUDY EFFECTIVENESS OF CORE STRENGTHENING EXERCISES VS CORE STRENGTHENING AND HIP ABDUCTOR STRENGTHENING EXERCISES ON PAIN AND FUNCTIONAL DISABILITY IN HOUSEMAIDS

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ABSTRACT

Background: CLBP affects more than 50% of the general population and 70% adults have at least 1 episode of LBP in life time. more than 60% of population in developing countries are engaged in unorganized and informal sectors amongst which housemaids are prone to intense level labor. The relationship between hip and LBP has been referenced in literature for long time although there are few papers focusing on both of these parameters.

Aim: To study effectiveness of core strengthening and hip abductor strengthening in CLBP.

Method: a comparative study was performed from jan 22 to june 22. 30 participants were included using purposive sampling. Subjects performed session 3 times a week for 4 weeks (Group A-Hip abductor strengthening, Group B-Hip abductor and core strengthening). Pre and post outcome measures were taken.

Outcome measures: VAS, Modified oswestery disability scale.

Results: Paired T test was used to analyze pre and post differences within the group and p value, mean and mean of differences were calculated. The pre treatment mean for group A was for vas was 6.2 and post treatment was 4.8 and for oswestery disability scale pre was 20.07 and post was 16.73. For group B pre treatment mean for vas was 6.36 and post was 4.65 and for oswestery scale pre was 20 and post was 14.27. The study was extremely significant as the P value was <0.0001.

Conclusion: The present study concluded the hip abductor strengthening with core strengthening is more effective than core strengthening in reducing CLBP and improvement in functional disability score in housemaids.

Keywords: CLBP, Hip abductor strengthening, Core strengthening, Housemaids

Introduction

Work related musculoskeletal disorders (WMSDs) are common problems among the workers engaged in unorganised sector. Working as a house maid is a very old profession. The study revealed different grades of pain in different parts of the body, maximum being the prevalence of low back pain¹

Chronic low back pain (CLBP) is defined as back pain lasting more than 12 weeks, and it affects more than 50% of the general population. It is estimated that over 70% of adults have at least one episode of low back pain during their lifetimes. ²

The clinical findings of CLBP suggest that lumbar mobility is decreased and recruitment order of core muscles is altered. The study concludes that core muscle strengthening exercise along with lumbar stabilization and strengthening is an effective rehabilitation technique for all chronic low back pain patients. ³

The results indicate atrophy in CLBP in the multifidus and paraspinal muscles⁴.

Gluteus medius weakness and gluteal muscle tenderness are common symptoms in people with chronic LBP. Clinical observation suggests that hip abductor weakness is common in patients with low back pain (LBP). ⁵

The gluteus medius muscle is usually active with providing lateral stability to lower lumbar region. So any imbalance in muscles function leads to disturbance in low back, which gives rise to the low back pain.

The function of hip abductors is to stabilize the femoral head in the acetabulum during different parts of the gait cycle. Hip abductor muscles play a vital role in low back pain. So, when these group muscles get affected it alters gait pattern. The altered gait pattern in return reflects on low back region. ^(1,5) Weakness of hip abductors has been described in low back pain when compared to healthy controls. ⁽³⁾

Need Of Study

Housemaids are prone to intense human labour, prolonged working hour, no work -no pay system, irregular work schedule and lack of additional allowances resulting in MSD among which there is the maximum prevalence of LBP.

Housemaids mostly belong to the lower to middle socioeconomic strata because of which they have to work throughout the day not only for them but for the family too for the income. Irrespective of presence of any pain or functional limitation they continue to work without getting proper treatment. In order to prevent the chances of reinjury or getting injured is the requirement of this study

More than 60% of population in developing countries are engaged in jobs are unorganized or informal sectors among which housemaids is common. Quite oftenly hip abductor strength has been ignored in LBP patients. Several studies shows hip abductor strength is reduced in chronic cases of LBP

There is low evidence for treatment of CLBP in housemaids. The relationship between hip and LBP has been referenced in the literature for long time although there are relatively few papers that focuses on both of these parameters togetherly.

Aims

1. To study EFFECTIVENESS of core strengthening in housemaids with CLBP
2. To study EFFECTIVENESS of core strengthening and hip abductor strengthening in housemaids with CLBP

Objectives

1. To study EFFECTIVENESS of core strengthening exercises in CLBP
2. To study EFFECTIVENESS of hip abductor strengthening in exercises CLBP

Hypothesis

NULL HYPOTHESIS :

H₀₁ : There will be no significant effect of core strengthening exercises in CLBP in housemaid and core strengthening with hip muscles strengthening in CLBP In housemaids

ALTERNATE HYPOTHESIS:

H₁: There will be significant effect of core strengthening exercises on pain.

H₂: There will be significant effect of core strengthening on functional disability.

H₃: There will be significant effect of core strengthening on pain and functional disability.

H₄: There will be significant effect of core strengthening and hip abductors strengthening exercises on pain.

H₅: There will be significant effect of core strengthening and hip abductors strengthening exercises on functional disability.

H₆: There will be significant effect of core strengthening and hip abductors strengthening exercises on pain and functional disability.

Review of Literature

1. Segmental stabilization and muscular strengthening in chronic low back pain: a comparative study²
Fábio Renovato França, Thomaz Nogueira Burke, Erica Sato Hanada, Amélia Pasqual Marques To contrast the efficacy of two exercise programs, segmental stabilization and strengthening of abdominal and trunk muscles, on pain, functional disability, and activation of the transversus abdominis muscle (TrA), in individuals with chronic low back pain. CONCLUSION: Both techniques lessened pain and reduced disability. Segmental stabilization is superior to superficial strengthening for all variables. Superficial strengthening does not improve TrA activation capacity.
2. Tarun Kumar, Suraj Kumar, Md Nezamuddin, VP Sharma Conducted the study on Efficacy of core muscle strengthening exercise in chronic low back pain patients RESULTS: The result described both the groups showed improvement in all the outcome measures including pain as well as in function using Numerical pain rating scale, Oswestry Disability Index, Sorensen test, Gluteus Maximus Strength, Activation of transversus abdominis and Modified-Modified Schober's Test. The improvement was statistically non-significant with inter groups and significant within group.
3. Nicholas A Cooper et al. Eur Spine J conducted study on Prevalence of gluteus medius weakness in people with chronic low back pain compared to healthy controls Conclusion: Gluteus medius weakness and gluteal muscle tenderness are common symptoms in people with chronic non-specific LBP. Future investigations should validate these findings with quantitative measures as well as investigate the effect of gluteus medius strengthening in people with LBP.

Methodology

1. Study size :30
2. Study design: comparative study
3. Sampling method: purposive sampling
4. Study population: housemaids
5. Study setting: physiotherapy OPD in Pune
6. Study duration: 6 months

Inclusion Criteria

1. Age: 20-40 years
2. Pain on VAS : between 5 – 8
3. Only females are included
4. Engaged in different household work for minimum of 3 years
5. Back pain lasted for more than 12 weeks
6. Housemaids doing swiping work primarily
7. Housemaids doing work for at least 3 to 4 hours a day

Exclusion Criteria

1. Patients with Acute radiculopathy
2. Females with recent fracture of hip or spine
3. subjects with specific back pain (fracture, osteoporosis or degenerative changes, prolapse intervertebral disc, bone disorders, arthritis, tumour)
4. subjects with previous spinal surgery
5. subjects with spinal infections

Materials

1. Pen
2. Paper
3. VAS scale
4. Modified Oswestery disability index

Procedure

- a) Study began with the presentation of synopsis to an ethical committee in PES MCOP.
- b) Various housemaids were approached in and around Pune.
- c) The subject were selected on the basis of their inclusion and exclusion criteria.
- d) The subject were explained about the study before starting the procedure.
- e) Consent was taken from the subject
- f) VAS scale and Oswestry disability index questionnaire were given and scores were recorded
- g) Housemaids were given 3 weeks exercise program with 3 times a week visit
- h) After the end of the 3 weeks, VAS and questionnaire were re-examined and data was collected and analysed

Hip abductor strengthening exercises ⁽⁷⁾ :

1. Supine Progression

Bridge 30 reps with 8 sec hold

Bridge with Arms Crossed 30 reps with 8 sec hold

Bridge with Arms Crossed & Feet Together 30 reps with 8 sec hold

SLS Bridge

2. Sidelying Progression

Clam at 45 degrees 30 reps with 8 sec hold

Sidelying hip abduction, knees extended 30 reps with 8 sec hold

Side plank, knees bent 30 reps with 8 sec hold

Side plank, knees extended 30 reps with 8 sec hold

3. Standing Progression 1

Standing abduction 30 reps

Standing abduction, with Theraband 30 reps

4. Standing Progression 2

Standing abduction with extension 30 reps

Standing abduction with extension, with Theraband 30 reps

Core strengthening exercises ⁽⁷⁾ :

1. Quadruped Progression

ADIM in quadruped 30 reps with 8 sec hold

ADIM in quadruped, UE lifts 30 reps with 8 sec hold, both sides

ADIM in quadruped, LE lifts 30 reps with 8 sec hold, both sides

ADIM in quadruped, UE & LE lifts 30 reps with 8 sec hold, both sides.

2. Supine Progression

- ADIM in supine 30 reps with 8 sec hold
- ADIM in supine, heel slides 20 reps with 4 sec hold, both sides
- ADIM in supine, LE lift 20 reps with 4 sec hold, both sides
- ADIM in supine, bridge 30 reps with 8 sec hold
- ADIM in supine, SLS bridge 30 reps with 8 sec hold, both sides
- ADIM in supine, curl up, elbows at sides 30 reps with 8 sec hold
- ADIM in supine, curl up, elbows elevated 30 reps with 8 sec hold
- ADIM in supine, curl up, hands at head

3. Standing Progression

- ADIM in standing 30 reps with 8 sec hold
- ADIM in standing, row 30 reps with 8 sec hold
- ADIM in standing, walking.

Statistical Analysis

Descriptive statistics were performed for all baseline characteristics like age, gender. Data was checked for normalcy. The level of significance of < 0.05 was considered to be statistically significant with 95% confidence interval. The study data was statistically analyzed using Graph Pad instat v 3.1. For all analyses, statistical tests were two-tailed and the threshold of the p value considered as significant set at < 0.05 . Thirty participants were recruited who received the treatment sessions within 4 weeks treatment period. No adverse effect was reported during sessions. Paired t test was used to analysis pre- post difference within the group and p value, mean and mean of difference was calculated. Un-paired t test was used to analysis post- post difference within the group and p value, mean and mean of difference was calculated. Results from the statistical analysis were tabulated and presented in graphical formats for better understanding and easier interpretations.

Discussion

The present study was undertaken with the intention to see the effect of hip abductor strengthening exercise along with core strengthening exercises as compared to Core strengthening alone on pain and functional disability in chronic low back pain in housemaids (age 20 to 40 years).

In this study total of 30 patients were included with 15 participants in each group. Both the groups received their respective protocols three times a week for 4 weeks.

The outcome measure pain by VAS and functional disability by Modified Oswestry disability Index was recorded before and after a period of 4 weeks for group A (hip abductor and core muscle strengthening exercises) and group B (core strengthening exercises).

Hodges and Morris et al. concluded that contraction of TrA develops Intra Abdominal Pressure (IAP) within the abdominal cavity by coordinated action of diaphragm, transvers abdominis and pelvic floor muscle that serves as a pressurized balloon attempting to separate the diaphragm and pelvic floor. This creates distraction of the lumbar decreases the compressive load on it.

The present study showed a significant improvement in group A for pain (VAS) and functional disability (Modified Oswestry Disability Index) which is similar to the results found in the study conducted by Vogt et al.

Both groups of patients experienced reduction of pain and improved functional disability but hip abductor muscle strengthening when given along with core strengthening can have significant effect on pain and functional disability in chronic low back pain.

Vogt et al. also concluded that there is very little movement at the SI joint which is important for the primary function of load transfer from the trunk to legs. If excess movement occurs at the joint, a positional change may occur between the ilium and sacrum thus compromising the L5-S1 intervertebral joints and disc, SI joint and pubic symphysis could lead to SI joint dysfunction and low back pain.

Due to its proximal attachment on to the sacrotuberous ligament, hip abductors are thought to cause tightening of the ligament, giving dynamic joint stability and thereby reducing mobility.

Hence he concluded that hip abductors producing stability to the SI Joint is provided by compression thus creating a self-bracing mechanism.

The reason for improvement in group A could be that hip abductor strengthening exercises incorporated into intervention in this study increased strength of hip abductors.

Kankaanpää et al. demonstrated increased fatigability of the hip abductors in individuals with CLBP. Leinonen et al. also demonstrated the hip abductors to be more easily fatigued in those with nonspecific CLBP, but noted improvement in the latency of firing in the hip abductors after rehabilitation.

Patients who suffer from low back pain often avoid painful movements and subsequently have reduced activity of hip abductors and decreased muscle endurance through disuse.

Conclusion

The present study concluded that hip abductor muscle strengthening along with core strengthening is more effective when compared with core strengthening alone in reducing chronic low back pain and improvement in functional disability score in housemaids.

LIMITATIONS:

1. Small sample size
2. Only short term effects of intervention were examined as the study was limited to 4 weeks of protocol.
3. Strength of core and hip abductor was not taken into account.

Future scope of study :

1. Long term effects of the intervention can be studied including the control group.
2. Core strength and hip abductor muscle strength can be used as outcome measure to see the effect of exercise.

References

1. Assessment of work related musculoskeletal disorders Piyali Mukherjee, Anindita Singha Roy, Amit Bandyopadhyay, Somnath Gangopadhyay *International Journal of Clinical and Experimental Physiology* 7 (2), 81-86, 2020
2. Clinic Print version ISSN 1807-593Clinics vol.65 no.10 São Paulo 201
<http://dx.doi.org/10.1590/S1807-59322010001000015> CLINICAL SCIENCE
3. Kumar T, Kumar S, Nezamuddin M, Sharma VP. Efficacy of core muscle strengthening exercise in chronic low back pain patients. *J Back Musculoskelet Rehabil.* 2015;28(4):699-707. doi: [10.3233/BMR-140572](https://doi.org/10.3233/BMR-140572). PMID: 25467999.
4. Goubert D, Oosterwijck JV, Meeus M, Danneels L. Structural Changes of Lumbar Muscles in Non-specific Low Back Pain: A Systematic Review. *Pain Physician.* 2016 Sep-Oct;19(7):E985-E1000. PMID: 27676689.
5. Cooper NA, Scavo KM, Strickland KJ, Tipayamongkol N, Nicholson JD, Bewyer DC, Sluka KA. Prevalence of gluteus medius weakness in people with chronic low back pain compared to healthy controls. *Eur Spine J.* 2016 Apr;25(4):1258-65. doi: [10.1007/s00586-015-4027-6](https://doi.org/10.1007/s00586-015-4027-6). Epub 2015 May 26. PMID: 26006705.
6. Ahiwale A, Yeole U, andTushar Dhawale SS. Association of gluteus medius strength and disability in patients with chornic low back pain.
7. Hameed PS. Prevalence of work related low back pain among the information technology professionals in India a cross sectional study. *Int J Sci Technol Res.* 2013 Jul;2(7):80-5.
8. Arab AM, Nourbakhsh MR. individuals with low back pain. *Chiropractic & osteopathy.* 2010 Dec;18(1):1

