Comparing the effects of trunk stabilisation and activation exercises on pain and disability in postpartum lumbo-pelvic pain: A randomised controlled trial

Rabia Yousaf Chaudhry, Hafiza Neelam Muneeb, Ameena Amjad, Sidra Shafique, Aqsa Naseem, Nafisa Shahzadi

Abstract
The purpose of this study was to determine and compare the effects of trunk stabilisation and activation exercises on pain and disability in postpartum lumbo-pelvic pain. It was a randomised clinical trial (ClinicalTrials.gov: NCT05490810). Twenty-eight females with lumbo-pelvic pain were randomly allocated to two groups with 14 patients in each group. Group A was treated with trunk stabilisation exercises and Group B was treated with trunk activation exercises, three times a week for eight weeks. Numeric pain rating scale was used to measure the intensity of pain. Disability was assessed through Oswestry disability index (ODI). Both the groups were evaluated before and at the end of the last treatment session. Data was analysed by SPSS 21. There was a significant difference between trunk stabilisation versus activation exercises on pain and disability in postpartum lumbo-pelvic pain with \( p<0.05 \) in Group A patients. The trunk stabilisation exercises were more effective for the treatment of lumbo-pelvic pain in postpartum females.

Keywords: Lumbosacral region, Pain, Postpartum, Exercises, Disability evaluation.

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Introduction
Recurrent discomfort in the lower back, sacroiliac joints, or a fusion of these regions is referred to as lumbo-pelvic pain in postpartum women.\(^1,2\) Symphysis pubis pain can also radiate along the posterior side of the leg or can be associated with it. About 50% of pregnant women experience lumbar and pelvic pain.\(^3\) After two to three years of delivery, the prevalence varies from 26.5% to 91.0%. After three months of delivery, the majority of women had totally recovered.\(^4\)

Clinically, patient’s history such as maternal age, parity, BMI, education, and unfavourable working conditions are all risk factors for severe pain.\(^5\) According to current studies, the development of lumbo-pelvic pain involves the transverse abdominal muscle (TrAM), hip extensor, and pelvic floor muscles (PFM). Furthermore, persistent lumbo-pelvic pain after delivery is indeed a manifestation of pelvic instability, asymmetry, and insufficient sacroiliac joint compression.\(^6\)

Trunk stability training is a popular fitness technique that is now being used in therapeutic interventions.\(^7,8\)

Physical therapy approaches confirm improving lumbo-pelvic pain. Trunk stability is important for balance maintenance in the kinetic chain, pelvis, and spine, and is part of a Lumbo-pelvic pain therapy programme.\(^8-11\) Stabilising exercises which include actively manipulating the lumbar segments and pelvic joints are beneficial for patients with lumbo-pelvic pain.\(^12-14\)

The goal of ‘trunk stabilisation’ exercises is to retrain the gluteal muscles, synchronous activity of the paraspinial and abdominal region, and lowering the risk of injury and suffering. A ratio of active, passive, and neutral control is used to maintain trunk stability. It is essential to comprehend how trunk stabilisation exercises can help individuals with low back pain by strengthening both global and local muscle groups.\(^15-17\)

Postpartum period has a great impact on society as it affects the quality of life. Trunk stability is essential for decreasing the burden on soft tissue structures and avoiding damage and pain. Separate studies have been done on the effect of trunk stabilisation exercises and trunk activation exercises on postpartum lumbo-pelvic pain. But only a limited evidence was available on the comparison of trunk stabilisation and trunk activation exercises. Therefore, the objective of this study was to assess the impact of trunk stabilisation versus activation exercises on pain and disability in postpartum lumbo-pelvic pain.\(^18-21\)

Patients/Methods and Results
A randomised clinical trial was conducted in Jinnah Hospital, Lahore, from January 01, 2022, to July 15, 2022. Sample size was 26 calculated by Epitool by using mean values of Oswestry disability index (ODI) score from a previous study.\(^1,2\) By adding 10% attrition rate, total sample size was reached at 28. For sample, size calculation mean 1 was 33.55; variance 1 was 6.68; mean 2 was 36.77; variance...
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Table 1 shows the comparison of pre- and post- VAS values in both the groups. For group A, the mean difference between pre- and post-treatment was 3.786±0.579). For group B, the mean difference between pre- and post-treatment was 1.714±0.825. Paired sample t-test was applied. The result showed statistically marked difference (p=0.03). Table 2 shows the comparison of pre- and post-treatment ODI values in both groups. For group A, the mean difference between pre- and post-treatment was 2.214±.426 (p=0.01). For Group B, the mean difference between pre- and post-treatment was 1.500±0.519 (p=0.03). Paired sample t-test was applied. The result shows that there was statistically marked difference. Table 3 shows the comparison of VAS between group A and B, with Pre-treatment 5.93±0.267 and 6.00±0.023 with p=0.327, while the comparison of VAS between group A and B with Post-treatment 2.14±0.663 and 4.29 ±0.825 with p=0.004.

Table-1: Comparison of Visual Analogue Scale within Group A and Group B (Paired sample t-test).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean±SD</th>
<th>Mean Diff.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk Stabilisation (n=14)</td>
<td>Pre-VAS 5.93±0.267</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-VAS</td>
<td>2.14±0.663</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activation Exercises (n=14)</td>
<td>Pre-VAS 6.00±0.023</td>
<td>1.714</td>
<td>0.04</td>
</tr>
<tr>
<td>Post-VAS</td>
<td>4.29±0.825</td>
<td></td>
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</tr>
</tbody>
</table>

SD: Standard Deviation.

Table-2: Comparison of Oswestry Disability Index Questionnaire within Group A and Group B (Paired sample t-test).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean±SD</th>
<th>Mean Diff.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk Stabilisation (n=14)</td>
<td>Pre-ODI 3.50±0.519</td>
<td>2.214</td>
<td>0.01</td>
</tr>
<tr>
<td>Post-ODI</td>
<td>1.29±0.469</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activation Exercises (n=14)</td>
<td>Pre-ODI 3.50±0.519</td>
<td>1.500</td>
<td>0.03</td>
</tr>
<tr>
<td>Post-ODI</td>
<td>2.00±0.555</td>
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</tbody>
</table>

SD: Standard Deviation.

Table-3: Comparison of Visual Analogue Scale between Group A and Group B (Independent t-test).

**Groups** | **p-value** |
<table>
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<tbody>
<tr>
<td>Group A (n=14)</td>
<td>Group B (n=14)</td>
</tr>
<tr>
<td>Mean (±SD)</td>
<td>Mean (±SD)</td>
</tr>
<tr>
<td>Visual Analogue Scale</td>
<td>5.93±0.267</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>2.14±0.663</td>
</tr>
</tbody>
</table>

SD: Standard Deviation.

Table-4: Comparison of Oswestry Disability Index Questionnaire between Group A and Group B (Independent t test).

**Groups** | **p-value** |
<table>
<thead>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A (n=14)</td>
<td>Group B (n=14)</td>
</tr>
<tr>
<td>Mean (±SD)</td>
<td>Mean (±SD)</td>
</tr>
<tr>
<td>Oswestry Disability Index</td>
<td>3.50±0.519</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>1.29±0.469</td>
</tr>
</tbody>
</table>

SD: Standard Deviation.
statistically significant because of $p<0.05$. Table 4 shows the comparison of ODI between group A and B. Group A and B with pre-treatment 3.5±0.519 and 3.5±0.519 has $p=1.000$. The comparison of VAS between Groups A and B with post-treatment 1.29±0.469 and 2.00±0.555 with $p=0.001$ is statistically significant because of $p<0.05$. Thus, alternative hypothesis was accepted.

Conclusion
It is determined that stabilisation exercises and activation exercises both reduce pain and disability after postpartum lumbo-pelvic pain. However, stabilisation exercises are more helpful in reducing disability and pain.

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References

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