

**SYSTEMATIC REVIEW****VISCERAL MOBILIZATION AS MANAGEMENT OPTION FOR LOW BACK PAIN - A SYSTEMATIC REVIEW****ABSTRACT****OBJECTIVE**

In this particular systematic review, the researcher evaluates the impact of visceral mobilization or manipulation in improving low back pain via standard protocols.

**MATERIALS AND METHODS**

Literature was searched electronically on various databases such as PEDro, PubMed Central, Google Scholar, BioMed Central, MEDLINE, EMBASE and Science Direct considering duration of 2011 to 2019. Randomized Controlled Trials investigating effectiveness of visceral manipulation or mobilization, either, in the comparison with different modalities or with sham/placebo were included. Data was extracted and studies were reviewed on standardized qualitative assessment criteria. Cochrane guidelines were followed to find out the risk of bias among the particular research.

**RESULTS**

All the studies provided moderate to high quality evidence in favor of visceral mobilization or manipulation being effective on low back pain in terms of risk of bias and quality assessment with significant results (p-value <0.05).

**CONCLUSION**

The available studies provided the significant and strong effectiveness of visceral manipulation and mobilization. However, scarcity of literature in domain raises an inevitable need for further studies to be conducted in future.

**KEYWORDS**

*Viscera, Mobilization, Low back pain, Quality of life, Sham, Pain.*

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## INTRODUCTION

LBP – Low Back Pain, is among the commonest pathological problems and it is more associated with comorbidity and disability than any other condition<sup>1,2</sup>. The pervasiveness of low back pain globally is reported 7.5% at 95% confidence interval that is higher in females as compared to males<sup>3</sup>. Approximately, about 80% of the population suffered from low back pain in their life span<sup>4</sup>. Statistical reports of United States suggest that every 1 individual out of 4 adults is reported to have suffered with low back pain almost every day, in last 3 months<sup>4</sup>. However, in most researches, age is regarded as the commonest contributing factor of low back pain<sup>5</sup>. Moreover, it is suggested that the incidence of low back pain increases tremendously, after 60-65 years of age<sup>6</sup>. Furthermore, statistics show that an increased pervasiveness of low back pain is also related with the patient's educational and socioeconomic statuses<sup>7</sup>. People with low educational status are predicted to suffer more prolonged episodes of low back pain and have a poor prognosis<sup>8</sup>. In other researches, LBP is the termed as an inconvenient condition to be managed for clinicians, patients, and policy makers<sup>9</sup>. Although, low back pain is equally prevalent among the individuals of all age groups and hinder daily aspects of their life<sup>10</sup>. However, its consequences badly affect the elderly population<sup>11</sup>. Researchers suggest that visceral dysfunction may be the underlying etiology of low back pain or contribute as the aggravating factor for it<sup>12</sup>. There are various approaches prevailed for the management of LBP, but preceding studies demonstrates visceral mobilization might be beneficial for the treating low back pain<sup>13</sup>. A recently conducted clinical case series demonstrate that the symptoms of low back pain were improved following a specific visceral manipulation technique in which a mobilization maneuver on the kidneys in people with nonspecific low back pain<sup>13</sup>. Studies show that specific visceral disorders, such as refractory irritable bowel syndrome and chronic constipation in women found good outcomes after visceral techniques on patient with Low back pain<sup>14</sup>. In asymptomatic individuals with chronic Low back pain do not reach the flexion relaxation phenomena, which is decrease in or absence of electromyography activity in paraspinal muscles found at the time of full trunk flexion<sup>15</sup>. The rational of this particular therapeutic study is that visceral disorders could potentially cause LBP<sup>14</sup>. The central sensitization activated by visceral nociceptors, these receptors trigger by alter gut environment/ urinary motility and these visceral receptor evoke peripheral hypersensitivity<sup>15</sup>. This is not yet understood the mechanism of visceral manipulation have effect on pain<sup>15</sup>. Hypothesis reveals that the supportive layers below skin that surrounds internal space of fissures of trunk and visceral nociceptive signaling is modulated by

visceral manipulation and specific manual treatments<sup>14</sup>. Over decades, the treatment for LBP is intuitive manipulation has been utilized for about last ten years almost in LBP treatment, but its efficacy is still unproven<sup>14</sup>. The mechanism of visceral pain referral to somatic structures occurs by neural merging, from where sympathetic afferent nerves conveys signal to visceral join with somatic nerves in the dorsal horn<sup>14</sup>. Just because of low intensity of visceral receptors it fails to bring mindful sensitivity, viscera nociceptive input can be misjudged as ascending from body (soma) structures<sup>14</sup> Evidence shows that people with low back pain has neuromuscular deficit in spine<sup>15</sup>.

## METHODOLOGY

The guidelines of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) were followed for this systematic review.

### Databases and Eligibility Criteria

Literature was searched electronically on various databases such as PEDro, PubMed Central, Google Scholar, BioMed Central, MEDLINE, EMBASE and Science Direct considering duration of 2011 to 2019. The retrieval strategies were utilized in order to perform article search include keywords, MeSH terms with use of Booleans such as "Visceral Mobilization AND low back pain", "Visceral mobilization AND LBP", "Visceral Mobilization and Manipulation", "VM AND LBP".

### Eligibility of Studies

Randomized Control Trials investigating effectiveness of visceral manipulation or mobilization, either, in the comparison with different modalities or with sham/placebo from 2011 to 2019 were included. The flow of studies is represented in Figure-1.

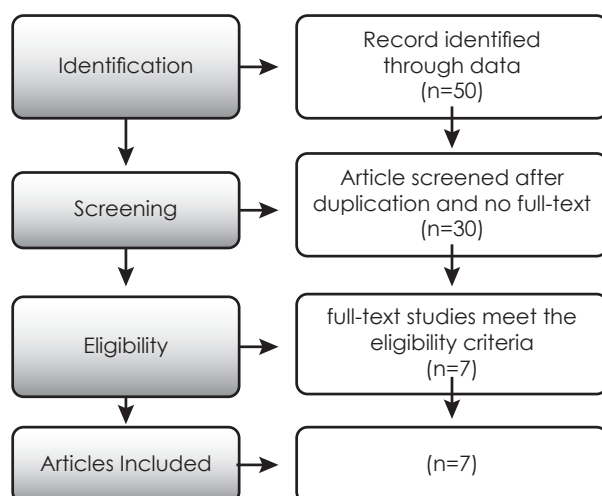


Figure.1 Flow of Studies according to PRISMA

### Study Characteristics

Among included studies, six were randomized control trials; however one is randomized placebo controlled trial. These studies recruited participants ranging from asymptomatic to those having chronic low back pain and even pregnant females with low back pain. Moreover, six studies compared the effects of visceral mobilization/manipulation with sham or placebo; but one study compared visceral mobilization with a combination of visceral mobilization and an intravaginal treatment maneuver. Table 1 represents the study characteristics of included researches.

### Outcome Measures

All studies considered perception of pain as the primary outcome measure. Secondary outcome measures consisted of quality of life, functionality, pregnancy mobility index, disability index and ultrasound.

### Extraction and Management

Data was extracted and analyzed according to per the criteria designed for induction of study. Studies comparing the role of visceral mobilization/manipulation and other manual therapy modalities on LBP either in combination of traditional/conventional physical therapy or as the sole treatment strategy were included. Few of the researches that fails to fulfill criteria of inclusion were excluded from this review such as the studies examining the effects of visceral manipulation of cervical spine or bowel movements. Moreover, outcomes measures of these studies included pain, disability index, mobility while pregnancy and quality of life. Considering the standardized protocols, all data were collected in a structured table in order to maintain the accuracy and validity of data. A standardized table was formulated to categorize the researches on the basis of first author's name, sample size, target population, provided intervention, outcome measures and results of each specific study that is represented as Table-1.

## RESULTS

### Selection of Articles

A total of 50 research articles were retrieved from various databases including such as PEDro, PubMed Central, Google Scholar, BioMed Central, MEDLINE, EMBASE and Science Direct published between the duration of 2011 to 2019. Considering the inclusion criteria, only seven studies were included. Data was extracted and quality assessment was performed using standardized protocol of PRISMA guidelines. However, due to heterogeneity among the selected articles and their outcomes measures meta-analysis could not be performed.

### Studies Synthesis

All outcomes measures were assessed for each

study with the interventions applied in order to examine the impact of visceral mobilization in improving low back pain as the primary outcome as well as functionality and quality of life. Conclusively, researches including Tamer et al<sup>18</sup> and Santosa et al<sup>16</sup> demonstrated significant difference in pain among the participant that received Visceral manipulation either in combination or alone with the p-value=0.9. Panagoulous et al<sup>19</sup> found no significant effect of visceral mobilization in between the group analysis. However, pain levels significantly decreased within both groups after visceral mobilization with or without vaginal maneuvers with p-value <0.05. Similar improvement was found for Pregnancy-Mobility Index (PMI) and Oswestry Disability Index. Therefore, this study affirmed the impact of visceral mobilization. Moreover, Panagoulous et al<sup>19</sup> revealed non-significant impact of visceral mobilization in short term i.e. duration of 2 weeks, however, significant impact on 52 weeks. Thus, this advocated the effectiveness of long term application of visceral mobilization in improving low back pain. Furthermore, McSweeney et al. 2012<sup>20</sup> came up with the significant improvement in low back pain among experimental group that received visceral mobilization specifically mobilization of sigmoid colon. Consecutively, Tozzi et al<sup>21,22</sup> concluded that Manual Fascial Techniques and Osteopathic Manipulation are effective to relief area of reduced sliding fascial mobility, and to reduce pain perception for immediate duration in subjects with non-specific LBP. All the outcomes are represented in Table 2.

### Risk of Bias and Overall Study Quality

Cochrane's standardized checklist was used to identify the overall risk of biasness of the studies included in this paper as represented in Table-3.

### Selection Bias

#### Random Sequence Generation

According to the author's judgment, random Sequence generation of all seven studies<sup>16,17,18,19,20,21,22</sup> included in the systematic review demonstrated low random risk generation.

### Allocation Bias

Similarly all included papers<sup>16,17,18,19,20,21,22</sup> displayed low risk of allocation concealment.

### Presentation Bias

#### Blinding of Participants and Personnels

Assessment revealed that Santosa et al<sup>16</sup>, Panagoulous et al<sup>14</sup> and Mcsweeney<sup>20</sup> reported low risk of bias.

However, study of Weisner et al<sup>17</sup> showed high risk of bias while a single study Tamer et al<sup>18</sup> provided no information regarding blinding of participant and personnel.

**Exposure Bias**

**Blinding of Result Assessment**

Three studies<sup>14,16,20</sup> reported low risk of bias. However, one study<sup>17</sup> showed high and one 18 showed unknown risk of bias.

**Attrition Bias**

**Incomplete Outcome Data**

Three out of five studies<sup>14,17,20</sup> reported the loss to

follow-up data and incomplete outcome data. However, studies of Tamer et al 18 and Santosa et al<sup>16</sup> found to commit attrition bias.

**Reporting Bias**

**Selective Reporting**

All the included studies<sup>16,17,18,19,20,21,22</sup> showed low risk of selective reporting.

Table-1 represents attribution of selected studies (n=7)

Author (Year)	Sample Magnitude (n)	Study Design	Target Population	Intervention	Outcomes	Results
Santos et al (2019) <sup>16</sup>	20	Preliminary, Randomized, Controlled, Double-Blind Clinical Trial	Chronic Low Back Pain (Aged 18-80 years)	Experimental group performed conventional physical therapy + visceral mobilization, 50 mins session, once/week for 5 weeks Control group performed conventional physical therapy + placebo visceral mobilization, 50 mins session, once/week for 5 weeks	Pain Lumber mobility Functionality	Experimental group significantly improves lumbar mobility and (p<0.05), No significant pain differences was observed
Wienar et al (2017) <sup>17</sup>	46	RCT	Females with pregnancy-related low back pain (>18 years)	Experimental group received Visceral Mobilization with intravaginal treatment, 3 treatments within 3 weeks Control group receives Visceral Mobilization only, 3 treatments within 3 weeks	VAS Oswestory Disability Index Pregnancy Mobility Index	Osteopathic treatments showed significant effects in reducing pain and increasing the lumbar range of motion (p<0.05)
Tamer et al (2017) <sup>18</sup>	39	RCT	Chronic non-specific low back pain (Aged >25 years)	Visceral Osteopathic Method group received Lymphatic, Liver Pumping, Pelvic Floor, Diaphragm Relaxation Technique, Neurovascular Technique, Visceral Organ Fascial Mobilization, 2 Sessions/Week For 5 Weeks Osteopathic Method group Soft-tissue mobilization, Muscle Energy Technique, manipulation and mobilization for lumber segments, plus stabilization,	Pain Quality of Life	Both managements were found to be effective on pain and function, physical function and Quality of Life (p<0.05)

Panagopoulos et al (2014) <sup>19</sup>	64	Randomized, Placebo Controlled Trial	Low Back Pain (Aged 18-80 years)	Standard PT+ real visceral manipulation, 1-2 times/week for 6 weeks Standard PT+ Sham visceral manipulation, 1-2 times/week for 6 weeks	Pain Functionality Disability	Visceral manipulation in addition to standard care is not effective in changing short-term outcomes
McSweeney et al (2012) <sup>20</sup>	15	A Single-Blinded, Randomized, Within Subjects, Repeated Measures	Low Back Pain (Aged >18 years)	Experiment conditions consisted of a visceral osteopathic mobilization of the sigmoid colon, sham intervention of manual contact on abdomen, and a non-intervention group (control)  Each subject received all three interventions on separate occasions, with a minimum of 48 h between each	Pain	Statistically significant improvement in pressure pain thresholds immediately after the intervention ( $P < 0.001$ ).
Tozzi et al (2012) <sup>21</sup>	101	Randomized Controlled Trial	Asymptomatic volunteers (Aged >18 years)	Experimental group received Osteopathic Fascial Manipulation to the lumbar region lasting not more than 3½ min in total  Control group received a sham treatment by someone who did not have any knowledge of anatomy or experience in manual therapy	Pain Ultrasound on Kidney and Bladder	OFM Improved kidney mobility and reduction of pain perception over the short-term
Tozzi et al (2011) <sup>22</sup>	60	Randomized Controlled Trial	Low Back Pain (Aged 18-60 years)	Experimental group received Manual Facial Techniques on the painful areas.  Control group blindly received a sham treatment	Pain Ultrasound on Kidney	MFTs are effective to release area of impaired sliding fascial mobility, and to improve pain perception

**Table. 2 represents Cochrane summary of risk of bias (n=7)**

Studies	Random Allocation	Allocation Concealment	Participants Blinding	Outcome Assessment Blinding	Incomplete Outcome Data	Selective Reporting
Santos et al (2019) <sup>16</sup>	✓	✓	✓	✓	✗	✓
Wienar et al (2017) <sup>17</sup>	✓	✓	✗	✗	✓	✓
Tamer et al (2017) <sup>18</sup>	✓	✓	?	?	✗	✓
Panagopoulos et al (2014) <sup>19</sup>	✓	✓	✓	✓	✓	✓
McSweeney et al (2012) <sup>20</sup>	✓	✓	✓	✗	✓	✓
Tozzi et al (2012) <sup>21</sup>	✓	✓	✓	✓	✗	✓
Tozzi et al (2011) <sup>22</sup>	✓	✓	✓	✓	✗	✓

✗ , indicates high risk of bias  
 ✓ , indicates low risk of bias  
 ? , indicates that the defined methodology cannot ensure risk of bias.

## DISCUSSION

The selected all studies were done on effects of visceral mobilization in low back pain. In all articles there were not specified the specific area of the pain in lower back<sup>16-22</sup>. One study did not mention the complete results of their studies. In our study pain intensity was reduced in both OMT and VOMT groups. In placebo controlled, assessors- blinded clinical trial explained the effects of OVM program in 6th week. We believed that visceral applications have a great impact in low back pain patients. Different physiotherapy techniques such as spinal mobilization and fascial releasing techniques have big impact in reducing low back pain<sup>23-24</sup>. We think, visceral fascial limitation provoking the pain in lumbar segment. We concluded from one study that a specific abdominal viscera such as sigmoid colon mobilization reduces the low back pain<sup>12</sup>. We concluded that duration and means restrict the outcome in a smaller sample magnitude that actually limits the importance of outcomes. Viscera's manipulation has limited hypoalgesic effects in LBP, but this difference might also demonstrated because in our research we use visceral manipulation in combination with standard care. The outcomes and physical relevance of these studies will be vital, not only for researchers

and policy makers, but it's also for patients who suffering from nonspecific low back pain and functional constipation<sup>23-25</sup>. In some studies therapist will not be blinded which is the limitation. In one study it was concluded the results at the end of the sixth week, in which a total of 10 sessions were applied being two sessions per week. But there were some limitations in the review, as most of the studies has a smaller sample size and short term follow up of control groups. Also the studies did not cover different physical therapy methods that included functional and objective evaluation are the limitation of this study. There were no remarkable adverse effects were reported by the participants in any of included study. However, the most common complaint includes discomfort after intervention and no serious adverse effect was reported<sup>21</sup>.

## CONCLUSION

It was concluded that effects of visceral mobilization in low back pain is significant, provided moderate to high quality evidence upon the effectiveness of visceral manipulation/mobilization with low to medium risk of bias however the segment was not filtered among the studies.

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