

Visceral manipulation intervention in functional dyspepsia with or without gastroesophageal reflux disease: a systematic review

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ABSTRACT

Functional dyspepsia is a prevalent gastrointestinal disorder characterized by symptoms like early satiety, postprandial fullness, and epigastric pain, affecting individuals with or without gastroesophageal reflux disease (GERD). The aim was to systematically map and summarize the existing literature on visceral manipulation interventions for functional dyspepsia. The systematic review followed rigorous methodology to ensure the validity and reliability of the findings. The study involved electronic searches of four major databases and five stages to review references to screened articles from January 2012 to February 2024. The search terms include "visceral manipulation," "visceral osteopathy", "osteopathic manipulation", "functional dyspepsia," "gastroesophageal reflux". Six articles were included in the review. Although there is currently little data to guide therapeutic treatment, research indicates that visceral manipulation therapy is feasible for people with functional dyspepsia, whether or not they also have GERD symptoms. Research on the effects of visceral manipulation on people with functional dyspepsia, whether or not they have GERD, is necessary to better understand treatment procedures and evaluate their advantages for patients with this condition. The growing interest in visceral manipulation intervention for functional dyspepsia is supported by mixed evidence, highlighting the need for high-quality research and larger sample sizes in future randomized controlled trials to determine its true impact.

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1. INTRODUCTION

Upper abdominal pain or discomfort that is persistent or recurrent without any structural, metabolic, or biochemical abnormalities, with or without gastroesophageal reflux disease (GERD) symptoms, is the hallmark of functional dyspepsia, a common gastrointestinal disorder [1], [2]. It affects up to 15% of the general population, and its exact cause of functional dyspepsia is not fully understood. However, it is believed to be related to abnormalities in digestive system function, including gastric motility and sensitivity [2]–[5]. The symptoms of early satiety, postprandial fullness, bloating, and epigastric pain are common in patients with functional dyspepsia and can have a major negative influence on their quality of life [6]–[8].

The rationale behind visceral manipulation is that restrictions or adhesions in visceral tissues can lead to altered biomechanics and neurophysiological functions, contributing to symptoms, such as pain and discomfort. By applying gentle manual techniques to the abdominal area, a trained practitioner can help

release these restrictions and improve overall function of the organs. This can lead to reduced pain, improved digestion, and enhanced overall well-being. While some evidence suggests that visceral manipulation may be effective in the treatment of certain gastrointestinal disorders, such as irritable bowel, its use in functional dyspepsia is not well established [9]–[11].

Owing to the multifactorial nature of functional dyspepsia, its management typically involves a combination of pharmacological approaches and lifestyle modifications, although some individuals may not respond adequately to these interventions [12]. In recent years, non-pharmacological strategies such as visceral manipulation have emerged as potential treatment options for functional dyspepsia. Visceral manipulation is a manual therapy technique aimed at improving the mobility and function of abdominal soft tissues and organs through specific gentle maneuvers [13]. The rationale behind visceral manipulation is to address restrictions or adhesions in visceral tissues that could lead to altered biomechanics and neurophysiological functions, contributing to symptoms, such as pain and discomfort [14].

While there is existing evidence supporting the efficacy of visceral manipulation in certain gastrointestinal disorders, such as irritable bowel syndrome, its application in functional dyspepsia is less well established [15]. Therefore, a systematic review focusing on visceral manipulation interventions for functional dyspepsia aimed to systematically outline and summarize the available evidence on the effectiveness of this approach in alleviating symptoms and improving the quality of life of patients with functional dyspepsia. Through the incorporation of diverse study designs and evidence types, a systematic review offers a thorough assessment of the existing body of knowledge regarding visceral manipulation for functional dyspepsia, pinpointing evidence gaps and possible avenues for further investigation [16].

The objective of a systematic evaluation of visceral manipulation therapies for patients with functional dyspepsia was to map and compile the available data on how well this method works to manage symptoms and enhance patients' quality of life. For complicated and diverse subjects, like manual therapy interventions, this kind of evaluation is especially helpful since it enables a thorough examination of the body of literature to spot evidence gaps and possible directions for further study. This systematic review offers a thorough summary of the current state of knowledge on a given issue by incorporating a variety of study styles and evidence categories.

By carefully gathering and analyzing all available evidence, the systematic review will provide a full picture of what is known about using visceral manipulation as a treatment for people with functional dyspepsia. The findings of this review may also have important implications for clinical practice by informing healthcare professionals about the potential benefits and limitations of visceral manipulation in functional dyspepsia management of functional dyspepsia. This study will enhance the standard of care and results for patients with functional dyspepsia by helping to create evidence-based guidelines and recommendations for the use of visceral manipulation interventions in this condition's management.

2. METHOD

To guarantee the validity and trustworthiness of the results, a strict methodology is followed in the systematic review of the effects of visceral manipulation in functional dyspepsia. Following the paradigm created by Arksey and O'Malley [17], this systematic review's methodology consists of five steps: i) formulating the research question; ii) locating pertinent studies; iii) choosing studies; iv) charting the data; and v) compiling, summarizing, and reporting the findings. A thorough examination of the body of research on visceral manipulation in functional dyspepsia is made possible by this methodical approach, which also offers important insights into the possible consequences and clinical practice implications of this technique. By following established guidelines and protocols, this systematic review aims to contribute to the evidence base surrounding this treatment modality and inform future research in the field.

2.1. Determining the research question and pertinent literature

The research question for this systematic review was as: What is the evidence for the effects of visceral manipulation on the management of functional dyspepsia? The research question was formulated to guide the search for relevant studies and to ensure that the review was focused and relevant. To identify relevant studies, a systematic search was conducted using the SCOPUS, PubMed, Google Scholars, and Semantic Scholar databases for articles published between January 2012 to February 2024. The search terms include "visceral manipulation," "visceral osteopathy", "osteopathic manipulation", "functional dyspepsia," "gastroesophageal reflux", and related keywords. The search strategy was designed to be comprehensive and inclusive, to ensure that all relevant studies were identified.

2.2. Selecting studies

Inclusion criteria were studies that investigated the effects of visceral manipulation on the management of functional dyspepsia, regardless of the study design. Studies must be published in English and include human participants. Studies were excluded if they focused on other gastroesophageal conditions

or did not specifically examine the visceral manipulation interventions. Two reviewers independently evaluated the full-text articles for inclusion in this systematic review, resolving any disagreements between them through discussion and consensus. Two reviewers independently screened the titles and abstracts of all the identified studies to determine their eligibility for inclusion, and full-text articles were obtained for all studies that met the inclusion criteria or were unsure of their eligibility.

2.3. Charting the data

A standardized data extraction form was utilized to chart the data from the listed research. The form contained details about the study's design, sample size, intervention dosage, reported results, pertinent findings, and degree of proof. The purpose of the data extraction form was to guarantee that all pertinent data was recorded and that the data were consistent between trials. This approach made it simple to compare and synthesize findings from various studies, offering a thorough picture of the state of the field. Additionally, by reducing bias and errors in data extraction, the standardized form improved the validity and reliability of the results.

2.4. Collating, summarizing, and reporting results

Lastly, the systematic review compiled, summed up, and reported the results from the included research. To find recurring themes, trends, and gaps in the literature, the data were combined. The systematic review's findings are presented in an understandable and succinct way. The results are presented in a way that is simple to comprehend and interpret. Additionally, the results can offer evidence-based suggestions for the use of visceral manipulation in the treatment of functional dyspepsia and are presented in a way that is pertinent to clinical practice. According to the 2011 Oxford Centre for Evidence-Based Medicine levels of evidence, we assigned each study a grade as shown in Table 1.

Table 1. Evidence levels from the Oxford Center for evidence-based medicine

Level	Type of study
1	Comprehensive analysis of randomized trials
2	Randomized trial
3	non-randomized follow-up research or control group
4	Studying case series and case-control
5	Not applicable

2.5. Research flow

The research flow for retrieving articles from the PubMed, SCOPUS, Google Scholar, Semantic Scholar databases is carried out using identification, screening, eligibility, and include the study techniques. After that, data analysis was carried out to obtain relevant and significant results. The research results are then compiled in the form of a report or scientific article for publication. This process ensures that the information obtained can be accessed and utilized by interested readers. The automation tools used are gradepro GDT 5 which can be accessed through the site <https://gdt.gradepro.org/app>. A total of 355 articles were excluded based on this automation tool for various reasons, including out of the scope, not open access, irrelevant to the topic, sample size, and type of study. More details can be seen in Figure 1.

3. RESULTS AND DISCUSSION

The 406 papers in all were reviewed. We chose 26 abstracts for the first screening after scanning the titles and abstracts and eliminating duplicates. Twenty-four full-text articles were chosen and vetted from this group. Figure 1 shows that eight articles satisfied all inclusion requirements. Two pilot or feasibility studies, one prospective study, two randomized trials, one pilot randomized trial, and two case reports comprised the eight eligible papers as presented in Table 2. Typically, sample sizes were small. The sample size for five of the investigations was fewer than thirty. The final selection's diversity of study approaches offers a thorough summary of the state of the field's research. Notwithstanding the modest sample sizes, the variety of study designs deepens the conclusions and enables a more complex comprehension of the topic.

The initial analysis of the included studies suggested that visceral manipulation may have potential benefits in the management of functional dyspepsia [14], [19]–[23]. Functional dyspepsia is a common gastrointestinal disorder characterized by recurring pain or discomfort in the upper abdomen, often accompanied by bloating, early satiety, and nausea, with or without gastroesophageal reflux disease symptoms [24], [25]. The exact cause of functional dyspepsia is not well understood, and treatment options are limited [26]. These studies examined various outcomes related to functional dyspepsia, such as pain intensity, quality of life, and gastric emptying. While the results of individual studies varied, some evidence suggests that visceral manipulation may lead to improvements in these outcomes.

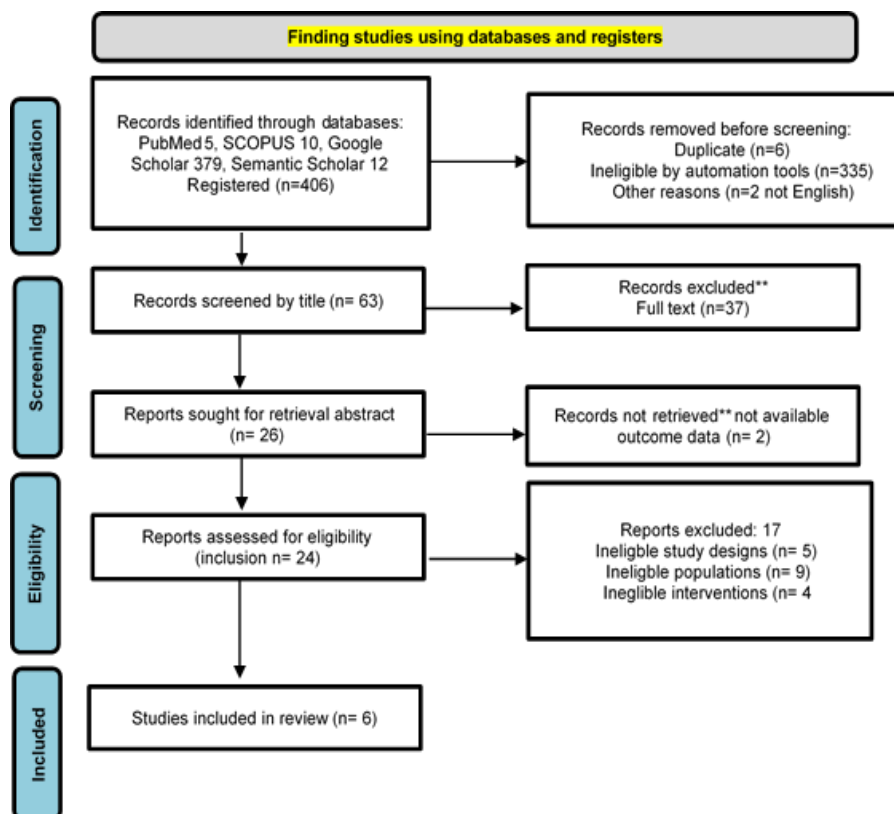


Figure 1. Flow chart [18]

Visceral manipulation is a manual therapy technique that involves gentle, specific, and targeted movements of the abdominal organs, fascia, and ligaments [27], [28]. It aims to improve the mobility and function of organs, enhance blood flow, and restore balance of the autonomic nervous system. Some possible ways that visceral manipulation can help patients with functional dyspepsia by lowering inflammation, improving gastric motility, and lowering visceral hypersensitivity [29], [30]. It may also help reduce symptoms such as bloating, nausea, and abdominal pain commonly associated with functional dyspepsia [26], [31], [32]. Visceral manipulation can potentially improve overall digestion and nutrient absorption for individuals suffering from this condition [33]–[36]. Visceral manipulation can offer a holistic approach to treating functional dyspepsia by addressing the root causes of the symptoms. By targeting the underlying issues in the digestive system, patients may experience long-term relief and improved quality of life [16], [37], [38]. Visceral manipulation has been shown to enhance circulation and lymphatic drainage in the abdominal region, which can further support digestive health. Incorporating visceral manipulation into a comprehensive treatment plan may lead to significant improvements in symptoms and overall well-being for individuals with functional dyspepsia [39].

The studies included in the systematic review examined the effects of visceral manipulation on various outcomes related to functional dyspepsia such as pain intensity, quality of life, and gastric emptying. While the results of individual studies varied, some evidence suggests that visceral manipulation may lead to improvements in these outcomes. For example, a randomized controlled trial found that visceral manipulation was more effective in improving gastroesophageal reflux disease symptoms one week after treatment, cervical mobility, and pressure pain threshold [22]. Visceral manipulation is associated with a significant ability to allow the gastroesophageal junction to regain natural elasticity and function [40].

One potential mechanism of visceral manipulation in functional dyspepsia is the modulation of visceral hypersensitivity [15]. Visceral hypersensitivity is a common feature of functional dyspepsia and is believed to contribute to the development of symptoms, such as pain and discomfort [41]. Visceral manipulation may help reduce visceral hypersensitivity and alleviate symptoms by improving the mobility and function of abdominal organs [42]. Another potential mechanism of action for visceral manipulation in functional dyspepsia is improvement in gastric motility [43]. Several studies included in the systematic review reported that visceral manipulation was associated with a significant improvement in gastric emptying time, suggesting that it may help normalize stomach function and improve digestion [44]–[46].

Table 2. Summary of reviews

Authors and country	Type of study and level of evidence	Objective	Type of gastroesophageal disorders, age range, and sample size	Interventions	Outcome measures and measurement	Main findings
[19]	Double group: before-after; level 3	To compare pressure readings in patients with gastro-oesophageal reflux disease during the lower esophageal sphincter examination before and right after osteopathic diaphragm intervention	Gastroesophageal reflux disease, aged >18 years; n=38 (osteopathic interventions =22 patients, control group =16 patients)	Diaphragm stretching technique as osteopathic intervention, sham technique as placebo intervention, no frequency reported	Using esophageal manometry, the lower esophageal sphincter's maximum expiratory pressure and average respiratory pressure were determined.	The osteopathic manipulative method enhances the lower esophageal sphincter region, resulting in an average breathing pressure of P=0.027, with no significant variation in maximum expiratory pressure.
[14]	Pilot randomized controlled trial (double-blind); double group: before-after; level 2	To assess how osteopathic visceral manipulation of the stomach and liver affects functional dyspepsia patients' pain, cervical mobility, and upper trapezius muscle electromyography activity	Functional dyspepsia with chronic nonspecific neck pain; no aged reported; n =28 (osteopathic visceral manipulation =14 patients, placebo visceral manipulation =14 patients)	The study involves osteopathic visceral manipulation on the stomach and liver, followed by a placebo visceral manipulation as a sham technique, with the duration being 5 minutes per day.	A flexiometer for cervical range of motion, an electromyography for upper trapezius muscle activity, and a numerical rating scale for pain	Visceral mobilization for stomach and liver can alleviate cervical pain and enhance the upper trapezius muscle electromyography signal in patients with nonspecific neck pain and functional dyspepsia.
[20]	Case report: before-after; not classified	The study investigates the impact of stomach and liver manipulation on neck pain, cervical range of motion, and upper trapezius muscle electromyography activity in individuals with functional dyspepsia.	Functional dyspepsia with chronic nonspecific neck pain; 18 yr old female and 25 yr old female; n=2	Visceral manipulation on the stomach and liver, visceral manipulation:5 min/dyx7 days	Using a flexiometer to measure cervical range of motion, an electromyography to measure upper trapezius muscle activity, and a numerical rating scale to assess pain	Two functional dyspepsia patients with neck pain experienced significant improvements in neck pain, cervical spine range of motion, and upper trapezius muscle electromyography activity after a single visceral manipulation.
[21]	Single-blinded prospective study; before-after; Level 4	The study aims to develop an osteopathic manipulative therapy protocol for treating gastro-oesophageal reflux disease, evaluating its effectiveness using the quality-of-life scale.	Gastro-oesophageal reflux disease; 55-year-old man; n=1; history of hoarseness and heartburn for 4 years	The oesophagus and diaphragm undergo a three-session osteopathic manipulation therapy.	The gastro-oesophageal reflux disease quality of life scale four times (before the first session, before the third session, and two and four weeks after the third session).	The somatovisceral approach to treating gastro-oesophageal reflux disease should incorporate osteopathic manipulative therapy to alleviate symptoms in the diaphragm and oesophagus.
[22]	A randomized, double-blind placebo-controlled trial; before-after; Level 2	The study assesses cervical mobility, C4 spinous process pressure pain threshold, and the impact of visceral osteopathic technique on symptoms of gastro-oesophageal reflux disease.	Gastro-oesophageal reflux disease; n =60; patients ages 18-70 (control group =31; visceral osteopathic technique =29)	The lower esophageal sphincter underwent treatment using visceral osteopathic technique and a sham technique, with daily sessions of 5 minutes per day for seven days.	The week following intervention, the gerdQ questionnaire is used to evaluate symptom changes. cervical mobility and PPTs before and after both treatments using an algometer and cervical range of motion	One week following treatment, cervical mobility, PPTs, and symptoms of gastro-oesophageal reflux improve with the visceral osteopathic technique.
[23]	A randomized controlled trial; before-after; Level 2	To determine whether osteopathic treatment is beneficial for patients suffering from gastro-oesophageal reflux disease	Gastro-oesophageal reflux disease; n =70; patients ages 18-70 (35 in intervention group, 35 in control group)	Osteopathic therapy: within eight weeks; control group: within eight weeks	The Reflux and Dyspepsia Quality of Life Questionnaire is utilized to assess the quality of life in relation to symptoms of gastro-oesophageal reflux disease.	Osteopathic treatments may benefit patients with gastro-oesophageal reflux disease, with future research focusing on longer follow-up periods and a global rating of change measurement.

Overall, these findings suggest that visceral manipulation may have a positive impact on the underlying mechanisms contributing to functional dyspepsia. By improving gastric motility and reducing visceral

hypersensitivity, this manual therapy technique could potentially offer relief for individuals experiencing symptoms such as pain and discomfort [25], [30], [47], [48]. Visceral manipulation has been shown to decrease bloating and improve overall gastrointestinal function in patients with functional dyspepsia [49]–[52]. These promising results highlight the potential of this non-invasive treatment option for managing digestive issues. Incorporating visceral manipulation into a comprehensive treatment plan may provide a holistic approach to addressing functional dyspepsia symptoms. It is important for individuals to consult with a healthcare provider to determine if this technique is appropriate for their specific condition. Visceral manipulation involves gentle, hands-on techniques that aim to improve the mobility and function of internal organs, potentially relieving pain and discomfort. This alternative therapy has been gaining attention for its potential benefits in managing digestive issues, offering a non-invasive option for those seeking relief from functional dyspepsia symptoms [53], [54].

While the systematic review provides preliminary evidence for the potential benefits of visceral manipulation in functional dyspepsia, the current literature does not support its widespread use as a first-line treatment. However, given the limited treatment options for functional dyspepsia and the potential benefits of visceral manipulation, it may be considered as an adjunctive therapy in patients who do not respond to conventional treatments or prefer a non-pharmacological approach. Clinicians should carefully assess individual patient needs, preferences, and treatment goals when considering the use of visceral manipulation in the management of functional dyspepsia [55], [56]. Clinicians need to have open and honest discussions with patients about the potential risks and benefits of visceral manipulation before incorporating it into their treatment plan. Further research is needed to better understand the mechanisms of action and long-term efficacy of visceral manipulation in functional dyspepsia. This will help ensure that patients are well-informed and actively involved in their treatment decisions. With more evidence-based research, clinicians can make more informed recommendations regarding the use of visceral manipulation for functional dyspepsia. This will ultimately lead to improved patient outcomes and satisfaction with their treatment. In the meantime, clinicians should continue to stay updated on the latest research findings and guidelines related to visceral manipulation to provide the best possible care for their patients.

A systematic review of the effects of visceral manipulation on functional dyspepsia provided a comprehensive overview of the existing literature on this topic. Although the review is still ongoing, and the final results are not available, some preliminary findings can be discussed based on the included studies and their initial analyses. This discussion highlights the potential benefits and limitations of visceral manipulation in functional dyspepsia management of functional dyspepsia. Some studies suggest that visceral manipulation may improve symptoms such as bloating and discomfort in patients with functional dyspepsia [32], [57]–[59]. However, more research is needed to fully understand the mechanisms behind these potential benefits and to determine the long-term effectiveness of this treatment approach. The preliminary findings suggest that visceral manipulation may be a promising approach for managing functional dyspepsia symptoms. Future studies should focus on larger sample sizes and longer follow-up periods to provide more conclusive evidence on its efficacy. Exploring the effects of visceral manipulation on other gastrointestinal conditions could provide valuable insights into its broader therapeutic potential. By further investigating the specific techniques and frequency of treatment that yield the best results, healthcare providers can optimize the use of visceral manipulation in clinical practice.

4. CONCLUSION

The initial analysis of the included studies suggests that visceral manipulation may have potential benefits in the management of functional dyspepsia. These studies examined various outcomes related to functional dyspepsia, such as pain intensity, quality of life, and gastric emptying. While the results of individual studies varied, some evidence suggests that visceral manipulation may lead to improvements in these outcomes. Some possible ways that visceral manipulation can help people with functional dyspepsia by lowering gastroesophageal reflux disease, changing visceral hypersensitivity, and improving stomach motility. However, the quality of the included studies varied and the heterogeneity of the study designs, interventions, and outcome measures made it challenging to draw definitive conclusions. Comparative effectiveness research is required to determine the relative benefits and risks of different interventions for functional dyspepsia. Studies comparing visceral manipulation with other manual therapy techniques or conventional treatments could provide valuable insights into the optimal management of this condition.

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