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NON-PHARMACOLOGICAL STRATEGIES TO REDUCE BLOATING AND ABDOMINAL DISTENSION: A SYSTEMATIC REVIEW

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ABSTRACT

Bloating and abdominal distension are common complaints that can be caused by various factors, including intestinal motility disorders, postoperative effects, and functional digestive disorders. While pharmacological therapy is often used, various non-pharmacological interventions have been developed as safer alternatives with minimal side effects.This literature review aims to examine various non-pharmacological interventions for addressing intestinal motility disorders, bloating, and abdominal distension based on available evidence. A search for scientific articles, including randomized clinical trials and randomized controlled trials, was conducted using inclusion and exclusion criteria based on the PICOS format. Articles were retrieved from databases such as Google Scholar, PubMed, ScienceDirect, and CINAHL (2018–2025), focusing on publications in English and Indonesian. Keywords related to bloating, flatulence, and abdominal distension interventions were used to identify relevant studies. The process of searching for high-quality research articles was conducted using the PRISMA 2020 diagram. Initially, 831 articles were identified, with 648 eliminated due to duplication, being outside the topic, or lacking full-text access. This resulted in 183 articles screened. After the eligibility assessment, 170 articles were further excluded for not meeting the inclusion and exclusion criteria. The final selection process resulted in 13 articles that were included and discussed in this study. Non-pharmacological interventions have been shown to effectively reduce bloating and accelerate the recovery of intestinal peristalsis. Specific interventions include: (chewing gum, which promotes flatus release and defecation; mentha spicata L. essential oil, which has analgesic properties and reduces bloating; warm compresses, which significantly enhance intestinal peristalsis; thoracoabdominal biofeedback, which effectively reduces abdominal distension; early mobilization, which accelerates the recovery of intestinal peristalsis and lowers the risk of postoperative ileus; chamomile, which has therapeutic effects in reducing flatulence and distension; coffee or caffeine consumption, which significantly promotes intestinal function recovery. Non-pharmacological interventions have proven effective in alleviating symptoms and accelerating the recovery of intestinal peristalsis, bloating, and abdominal distension.

Keywords: abdominal distension; bloating; flatulence; non-pharmacological interventions

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INTRODUCTION

Bloating is a subjective sensation described as feeling like there is gas trapped in the stomach, an increase in abdominal pressure, or a fullness sensation without an actual increase in abdominal size—also known as bloating without visible distension (Foley et al., 2014; Lacy et al., 2021). This subjective sensation is often experienced as fullness, swelling, trapped gas, or tightness, and in some cultures, it is described as "inflammation" (Moshiree et al., 2023). Abdominal distension, on the other hand, refers to the same subjective sensation but is objectively observed as an increase in abdominal circumference beyond the usual size, with percussion revealing hyperresonance (Permatasari et al., 2020). Bloating and distension may be diagnosed as a single entity (a primary or sole complaint) that does not overlap with other functional gastrointestinal disorders (Mari et al., 2019). Common causes of bloating and distension include carbohydrate enzyme deficiencies such as lactase and sucrase deficiency,

consumption of artificial sweeteners (e.g., sugar alcohols and sorbitol), and fructans. Small intestinal bacterial overgrowth (SIBO), celiac disease (CD), non-celiac gluten sensitivity (NCGS), and gluten intolerance also contribute to bloating and distension, with or without changes in bowel habits. Additionally, intestinal motility disorders and functional defecation disorders, such as dyssynergic defecation, are also major contributing factors (Moshiree et al., 2023).

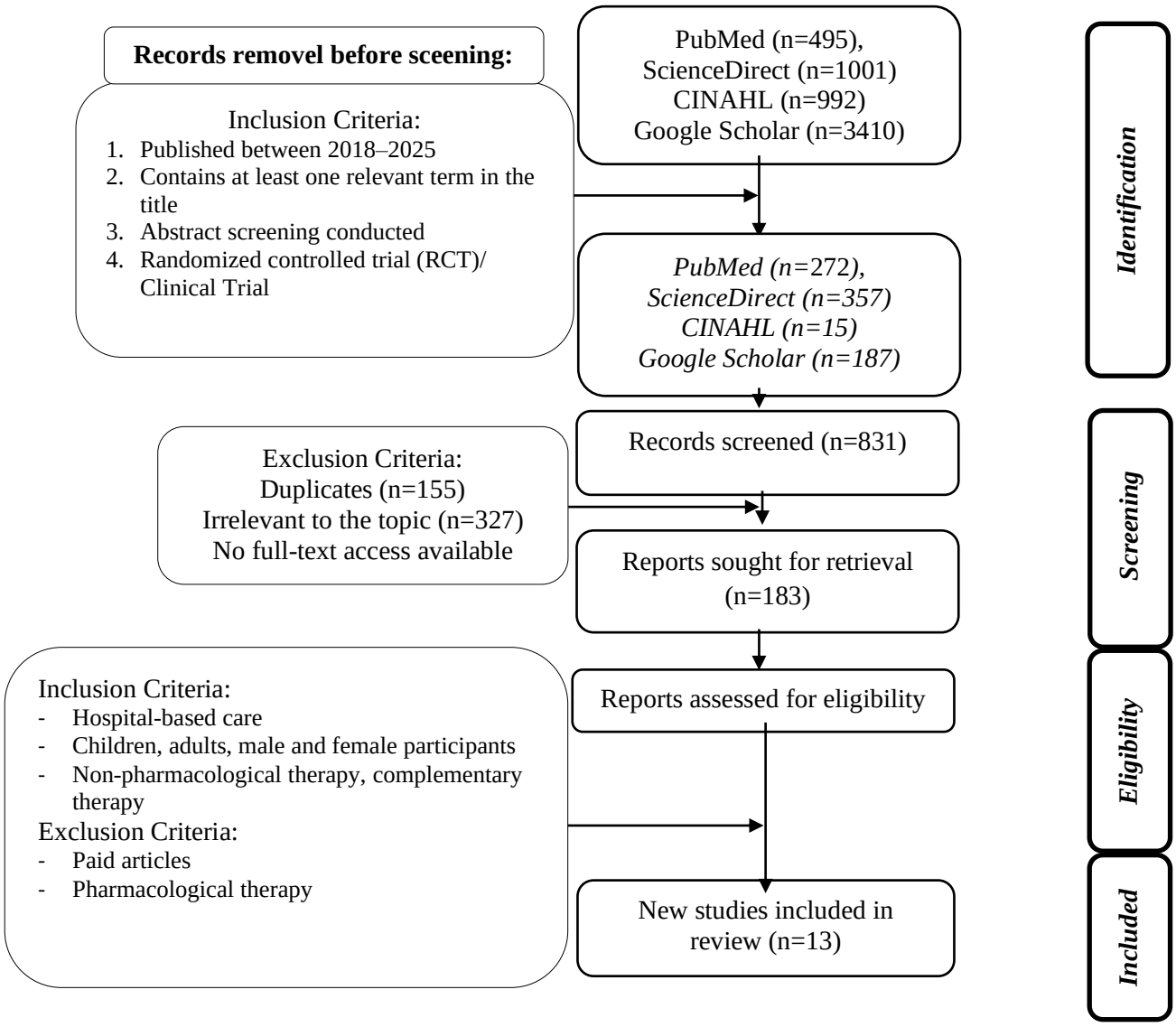
Bloating is also a common complication following laparoscopic cholecystectomy. The use of CO_2 gas during surgery can lead to its partial absorption into the intestines, resulting in bloating. Additionally, intra-abdominal visceral manipulation and parasympathetic dysfunction may cause ileus (intestinal dysfunction), further leading to bloating (Salimi Zadak et al., 2023). Postoperative CO_2 gas tends to accumulate under the diaphragm and around the liver and stomach due to its density and gravitational effects (Yi, 2022). The most frequently reported symptom among post-laparoscopic cholecystectomy patients is bloating, with a prevalence of 84.4% (Salimi Zadak et al., 2023). Bloating is also reported by 30% of the general adult population, especially among individuals with irritable bowel syndrome (IBS). In the United States, the prevalence of bloating among adults is 16%, with women reporting bloating more frequently than men (19% vs. 10.5%). Women are also more likely to experience more severe symptoms than men (24% vs. 13%) (Mari et al., 2019).The brain-gut interaction plays a crucial role in bloating treatment. Several management strategies include dietary modifications, biofeedback therapy, central neuromodulators, and psychotherapy (Moshiree et al., 2023). Diaphragmatic breathing techniques, central neuromodulators, and brain-gut behavioral therapies are potential treatments for bloating and distension, regardless of diagnostic correlation.

Various non-pharmacological interventions have been investigated to alleviate bloating. Warm compresses applied to the abdomen have been shown to enhance gastrointestinal recovery in women following gynecologic cancer surgery and significantly reduce the time to first flatus (Güngördük et al., 2023). Chewing gum has been found to improve postoperative bowel motility, accelerating the time to first flatus and first defecation after laparoscopic hysterectomy (Yavuz et al., 2020). Early mobilization after surgery has been shown to shorten the time to first bowel movement and first flatus (Wang et al., 2024). Coffee consumption has been demonstrated to accelerate bowel movement and first defecation in post-cesarean section patients (Zamanabadi et al., 2021).Bloating significantly affects patient comfort and quality of life. Currently, many patients rely on pharmacological therapies for bloating relief, despite the availability of various non-pharmacological approaches that have been studied. However, research on the effectiveness of nursing interventions for bloating remains limited, and no evidence-based guidelines are currently available for nurses to determine the safest and most effective therapies. This study aims to identify effective non-pharmacological interventions, analyze their mechanisms in reducing bloating symptoms, compare their safety and side effects, and provide evidence-based recommendations for selecting the best intervention for patients experiencing bloating. Therefore, finding safe and effective complementary therapies is a crucial step in improving the quality of care for patients with bloating complaints.

METHOD

This study employs a literature review design to examine nursing interventions for managing patients with bloating. Literature searches were conducted using electronic databases, including PubMed, ScienceDirect, CINAHL, and Google Scholar. The keywords used in the search included "bloating," "flatulence," and "abdominal distension." Boolean operators such as "AND," "OR," and "NOT" were applied to refine or expand search results. The process of searching for high-quality research articles was conducted using the PRISMA 2020 diagram.

Initially, 831 articles were identified, with 648 eliminated due to duplication, being outside the topic, or lacking full-text access. This resulted in 183 articles screened. After the eligibility assessment, 170 articles were further excluded for not meeting the inclusion and exclusion criteria. The search yielded 13 relevant articles related to nursing interventions for bloating management. Inclusion criteria for this study were is articles published within the last eight years (2018–2025), studies discussing nursing interventions or non-pharmacological approaches for bloating, articles written in English or Indonesian, study types limited to randomized controlled trials (RCTs). Exclusion criteria included is studies focusing solely on pharmacological treatments without addressing nursing aspects, research involving non-human populations.Data analysis involved identifying relevant articles, screening them based on titles and abstracts, and assessing their quality using Critical Appraisal Tools. The quality assessment followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021).Based on the literature review, the authors identified non-pharmacological therapies/interventions for managing bloating and distension, consisting of 13 randomized controlled trials (RCTs). Below is the list of 13 articles obtained through the identification, screening, and eligibility stages, as illustrated in the PRISMA diagram below.



RESULT

As a result of the literature search and selection process, (number) relevant articles were identified that met the inclusion criteria. These articles discuss various nursing interventions used to manage bloating, employing different approaches. To ensure the quality of this study's findings, the selected articles were carefully screened based on inclusion and exclusion criteria. Additionally, all articles included in this study were sourced from reputable journals.

Table 1.
Article Search Results (n= 13)

No	Sumber	Hasil
1.	*Thoracoabdominal Wall Motion–Guided Biofeedback Treatment of Abdominal Distention: A Randomized Placebo-Controlled Trial* (Barba et al., 2024)	Patients in the biofeedback group (n = 19) learned to correct abdominophrenic dyssynergia triggered by disruptive food intake. They exhibited a decrease in intercostal activity by an average ± SE of 82% ± 10%. An increase in anterior wall activity by an average ± SE of 97% ± 6%. A smaller increase in abdominal circumference, with an average ± SE of 108% ± 4%. Additionally, they experienced an improvement in clinical symptoms, with abdominal distension scores decreasing by an average ± SE of 66% ± 5%. These effects were not observed in the placebo group (all, $P < .002$).
2.	*The effects of abdominal "I LOV U" massage along with lifestyle training on constipation and distension in the elderly with stroke* (Fekri et al., 2021)	A total of 68 patients were randomly allocated into the control group (n = 34) and intervention group (n = 34) during 2017–2018. Ultimately, 29 elderly patients in the intervention group and 34 elderly patients in the control group completed the study. The results indicated that both groups were homogeneous in demographic variables ($P > 0.05$). Repeated ANOVA showed a significantly greater reduction in abdominal circumference in the intervention group over the 10-day study period ($P = 0.029$). The Friedman test revealed a significant difference in defecation frequency between the two groups during the 10-day study period ($P < 0.0001$). Additionally, the CAS score decreased significantly more in the intervention group compared to the control group ($0.30 < 0.98 < 1.59$, $P = 0.001$, EF = 0.44). Food tolerance frequency via gavage ($P = 0.20$) and oral intake ($P < 0.001$) significantly increased in the intervention group.
3.	*Association of gum chewing with early gastrointestinal recovery in single-port laparoscopic gynecologic surgery* (Yin et al., 2023)	This study involved 100 patients, who were randomly assigned to either the chewing gum group (n = 52) or the routine care group (n = 48). Patients in the chewing gum group had a significantly shorter time to first passage of flatus compared to those in the control group (20.7 ± 13.1 vs. 26.8 ± 15.8 hours; $P < 0.05$).
4.	*Early ambulation and dhikr complementary therapies effect on intestinal peristaltic in post-open cholecystectomy patients* (Wilandika et al., 2023)	The sample consisted of 15 post-open cholecystectomy patients, and the study found a significant effect of early ambulation and dhikr therapy on the recovery of intestinal peristalsis in post-open cholecystectomy patients under general anesthesia ($Z = -3.442$; $P = 0.001$).
5.	*Coffee consumption for recovery of intestinal function after laparoscopic gynecological surgery: A randomized controlled trial* (Gungorduk et al., 2020)	A total of 96 patients were enrolled; 49 patients were assigned to the coffee group, and 47 were enrolled in the control group (warm water). The median time to flatus (19 [13–35] vs. 25 [15–42] hours; hazard ratio [HR] 1.9, 95% confidence interval [CI] 1.2–2.9; $P = 0.0009$), median time to defecation (30 [22–54] vs. 38 [26–65] hours, HR 2.4, 95% CI 1.5–3.8; $P < 0.0001$), and median time to food tolerance (2 [2–5] vs. 3 [2–8] days, HR 1.5, 95% CI 1.02–2.3; $P = 0.002$) were significantly reduced in patients who consumed coffee compared to the control subjects. Postoperative ileus was observed in seven patients (14.9%) in the control group and one patient (2.0%) in the coffee group ($P = 0.02$). No adverse effects were caused by coffee consumption.

6.	*Effect of caffeine on postoperative bowel movement and defecation after cesarean section* (Zamanabadi et al., 2021)	Of the total 36 patients (18 in the study group and 18 in the control group), the mean age, gravidity, parity, BMI, and gestational age did not differ significantly (P-value > 0.05). The average onset of bowel movement in the case group was 14.56 hours, while in the control group, it was 16.83 hours. The first defecation after a cesarean section in the case and control groups occurred at 27.78 and 31.67 hours, respectively. Both groups showed significant differences in these parameters, with P-values of 0.042 and 0.002, respectively.
7.	Pemberian kompres hangat efektif untuk pemulihan peristaltik usus pasien post operasi dengan anestesi umum (Syamsuddin, 2021)	The study results have shown the effectiveness of warm compress application in promoting peristaltic recovery in the experimental group, with a p-value of 0.000 ($p < 0.05$). Additionally, an independent t-test indicated a significant difference in intestinal peristalsis between the experimental and control groups in post-operative patients under general anesthesia, with a p-value of 0.022 ($p < 0.05$).
8.	Mobilisasi Dini Terhadap Pemulihan Peristaltik Usus Dan Skala Nyeri Pasien Post Pembedahan (Arianti et al., 2020)	A total of 40 subjects were included, with 20 subjects in the intervention group and 20 subjects in the control group. The Mann-Whitney statistical test demonstrated a significant effect of early mobilization on intestinal peristaltic recovery ($p = 0.000$) and pain scale ($p = 0.001$).
9.	*The effect of chamomile on flatulence after the laparoscopic cholecystectomy* (Salimi Zadak *et al.*, 2023)	The study found that chamomile significantly reduced the severity of flatulence compared to the placebo group after laparoscopic cholecystectomy. Analysis showed significant effects of time and group on flatulence severity ($P < 0.001$). No complications were observed in participants during the study. The mean flatulence severity increased over time in both groups, but less so in the chamomile group. The study suggests chamomile may have therapeutic effects on gastrointestinal issues, particularly flatulence
10.	*Effect of Yikou-Sizi powder hot compress on gastrointestinal functional recovery in patients after abdominal surgery* (Cao *et al*., 2018)	raditional Chinese medicine (TCM) interventions used externally after abdominal surgery do not have strong supporting evidence. There remains a lack of large-sample, multicenter, randomized, and standardized trials to clinically determine the effectiveness of TCM hot compress therapy.
11.	*Effects of Gum Chewing on Recovery From Postoperative Ileus: A Randomized Clinical Trail* (Hsu & Szu, 2022)	A total of 60 participants were included, with 30 in the intervention group and 30 in the control group. The time to first flatus and first bowel movement was significantly shorter in the intervention group compared to the control group (39.13 ± 15.66 vs. 52.92 ± 21.97 hours and 54.55 ± 18.90 vs. 77.98 ± 34.59 hours, respectively). However, after adjusting for age and surgery duration, only the time to first flatus remained significantly shorter in the intervention group. A significant positive correlation was found between the time to first flatus and the time to first bowel movement in both groups..
12.	Pemberian Minyak Telon Dalam Upaya Mencegah Perut Kembung Pada Bayi Baru Lahir (Permatasari et al., 2020)	Subject I showed improvement with a soft stomach and no bloating after intervention. By day three, Subject I's abdomen was slightly hard, indicating some changes. Both subjects maintained normal conditions, not crying without cause and exhibiting good sucking reflexes. The average abdominal circumference for Subject II ranged from 32-33 cm throughout the study. The intervention involved applying telon oil, which was effective in managing abdominal conditions.
13.	*Mentha spicata L. essential oil, phytochemistry and its effectiveness in flatulence* (Mahboubi, 2021)	M. spicata essential oil shows efficacy in reducing abdominal pain and flatulence severity in clinical studies. Supermint oral drop, containing 2% M. spicata essential oil, is effective for treating flatulence and indigestion. Significant improvement in symptoms was observed in patients using M. spicata essential oil compared to control groups. No hazardous effects were reported when M. spicata essential oil is used in proper dosages. The study suggests further clinical trials are needed to explore M. spicata essential oil's potential for other intestinal complaints.

The article selection process was conducted using the PRISMA 2020 diagram. A total of 5,898 articles were initially retrieved. Subsequently, 5,067 articles were excluded based on title identification, abstract screening, publication range (2018–2025), and study type (Randomized Controlled Trial [RCT] / Clinical Trial). The search was performed across three databases: Google Scholar (3,410 articles), PubMed (495 articles), and ScienceDirect (1,001 articles). During the screening phase, 648 articles were excluded due to the absence of full-text availability, irrelevance to the topic, or duplication.A total of 13 articles met the inclusion and exclusion criteria and were included in this review (Figure 1). Among these, 4 articles directly discussed the effectiveness of non-pharmacological therapy in reducing bloating and abdominal distension. Three articles explored non-pharmacological interventions for intestinal peristalsis recovery, while 5 articles examined the time to first flatus and bowel movement. However, one article did not provide supporting evidence for bloating reduction. The research methods used in the 13 analyzed articles included Randomized Controlled Trials (RCTs), experimental studies, and quantitative studies.

DISCUSSION

The management of bloating and abdominal distension after surgery has a high morbidity rate, and to this day, an appropriate alternative treatment to alleviate bloating is still being sought, as existing therapies often fail to provide adequate relief (Salimi Zadak et al., 2023). Proper assessment and management are required to mitigate the worsening impact of gastrointestinal issues, particularly bloating and distension. A literature review has identified several articles related to the assessment and management of bloating and distension.Bloating Assessment. Currently, bloating is a significant issue both in the general population and among post-operative patients in hospitals. Healthcare professionals, including doctors and nurses, assess bloating using subjective and objective data. Patients typically describe their symptoms as feeling like a balloon or resembling pregnancy. A sense of fullness or abdominal pressure may occur throughout the abdomen (subjective), and/or an increase in measurable abdominal circumference and abdominal percussion examination (objective) (Lacy et al., 2021; Mari et al., 2019; Zhang et al., 2022). Based on these criteria, there are two types of assessment for bloating and distension: subjective and objective evaluation. A literature review identified two commonly used assessment tools (Table 1).

Subjective Assessment. Several assessment instruments have been developed to measure bloating and abdominal distension, including the Visual Analog Scale (VAS) and the Numeric Rating Scale (NRS). Some studies suggest that the Visual Analog Scale (VAS) is an effective tool for measuring the severity of bloating or abdominal distension, allowing patients to express their level of discomfort in a standardized way. This tool is particularly useful in clinical settings where subjective symptoms need to be quantified. VAS can also help track symptom progression over time, allowing healthcare providers to evaluate the effectiveness of treatments aimed at reducing bloating and distension (Barba et al., 2024; Salimi Zadak et al., 2023).VAS uses a score ranging from 0 to 10, based on the patient's self-report. This scale consists of a 10 cm ruler (ranging from 0 to 10). A score of 0 indicates no bloating, while a score of 10 represents severe bloating. Scores of 1 to 3 indicate mild bloating, 4 to 7 indicate moderate bloating, and 8 to 10 indicate severe bloating (Salimi Zadak et al., 2023). Another study used the Numeric Rating Scale (NRS) to compare post-operative effects on abdominal pain and bloating between two groups. The NRS is a segmented numerical version of the VAS, where respondents select an integer between 0 and 10 (Soyama et al., 2024). In a study conducted by Schmulson et al. (2023), pictograms were found to be more effective than verbal descriptors (VDs) in assessing the presence of bloating and distension symptoms. The pictogram consists of four visual representations: normal abdomen, bloating, distension, and a combination of bloating and distension. The use of pictograms can

complement or even improve the accuracy of VAS and NRS methods, especially for individuals who have difficulty understanding medical terms such as "abdominal distension." Objective Assessment. Several objective instruments (physical examination) are used to assess bloating and distension. The most commonly used techniques include is a physical examination to observe abdominal distension and detect hyper-tympanic sounds through percussion assessment of the abdomen. Auscultation examination to identify bowel sounds, such as rumbling, intestinal noises, or tinkling sounds (Zhang et al., 2022). Distension assessment using Plethysmography and Electromyography (EMG), which records diaphragm and abdominal muscle movements to accurately measure distension (Barba et al., 2024). Abdominal distension as an objective physical manifestation of increased abdominal circumference (Lacy et al., 2021). Hydrogen and Methane Breath Tests to detect excessive bacterial fermentation in the small intestine, which contributes to bloating and flatulence symptoms (Mahboubi, 2021).

Gastrointestinal function can also be assessed using the Gastrointestinal Recovery Index, which measures the time to first flatus (passing gas), first defecation (bowel movement), first bowel sounds, and first food intake. This method is commonly used in studies on postoperative ileus, a condition in which bowel motility slows down after surgery (Cao et al., 2018). Additionally, physical examination can be used to assess bloating by observing abdominal distension and hyper-tympanic sounds during percussion examination. Auscultation can also reveal increased bowel sounds, which may indicate increased intestinal peristalsis (Syamsuddin, 2021; Zhang et al., 2022).Bloating and gastrointestinal distension are common conditions that can significantly impact an individual's quality of life. Flatulence (gas accumulation) is caused by various factors, including intestinal motility disorders, changes in gut microbiota, psychological stress, and the consumption of certain foods (Mahboubi, 2021).. Several studies have shown that flatulence is frequently associated with irritable bowel syndrome (IBS), functional constipation, and other disorders that lead to gas accumulation in the gastrointestinal tract (Salimi Zadak et al., 2023).

One study found that post-operative flatulence and abdominal distension are often caused by the effects of anesthesia and organ manipulation during surgery, which disrupts intestinal peristalsis (Salimi Zadak et al., 2023). As a result, various intervention methods have been developed to aid intestinal peristalsis recovery and alleviate bloating symptoms. A literature review on bloating and gastrointestinal distension identified several contributing factors, including intestinal motility disorders, gas accumulation in the digestive tract, and the effects of anesthesia and surgical procedures on the gastrointestinal system.Factors Contributing to Bloating and Abdominal Distension. Flatulence and abdominal distension can arise as post-operative complications, particularly following laparoscopic surgery due to the use of CO_2 gas and visceral manipulation, which hinder intestinal motility (Salimi Zadak et al., 2023). Other contributing factors include parasympathetic dysfunction, an improper diet, and stress and anxiety (Barba et al., 2024).

Non-Pharmacological Interventions for Managing Bloating and Distension

Herbal Therapy Chamomile and Essential Oils. Chamomile has therapeutic effects in reducing flatulence due to its flavonoid and bisabolol content, which possess antispasmodic and anti-inflammatory properties (Salimi Zadak et al., 2023). Additionally, essential oils from Mentha spicata have been traditionally used in treating gastrointestinal disorders, including bloating (Mahboubi, 2021).Biofeedback Therapy for Abdominal Distension. Biofeedback techniques that involve breathing control and thoracoabdominal wall movements have been proven effective in reducing abdominal distension. This technique helps patients regulate diaphragmatic activity to correct abdominophrenic dyssynergia, a condition that contributes to

bloating (Barba et al., 2024).Warm Compress Therapy to Improve Intestinal Peristalsis. A study conducted by Syamsuddin (2021)found that applying warm compresses significantly enhances the recovery of intestinal peristalsis in post-operative patients who received general anesthesia. The study, which used an experimental design with a control group, showed that the group receiving warm compress therapy experienced faster peristalsis recovery compared to the control group (p = 0.000) (Barba et al., 2024). Another study by Cao et al. (2018) on the use of Yikou-Sizi powder hot compress demonstrated that this therapy is effective in accelerating the recovery of intestinal peristalsis in post-abdominal surgery patients. The results showed significant improvements in gastrointestinal parameters, such as the time to first flatus and defecation. The first, mechanism by which warm compress therapy aids in peristalsis recovery includes: Increasing blood flow to the abdominal area, stimulating parasympathetic nerve activity and enhancing intestinal motility. The second, reducing smooth muscle spasms, which can slow peristalsis after surgery or due to gas accumulation in the intestines. The third, decreasing inflammation and abdominal muscle tension, thereby accelerating gastrointestinal function recovery. With this evidence, warm compress therapy can be recommended as a safe and effective non-pharmacological method to enhance post-operative peristalsis recovery.

Early Mobilization for Intestinal Peristalsis Recovery. A study by Arianti et al. (2020) found that early mobilization has a significant effect on intestinal peristalsis recovery and pain reduction in post-operative patients. The study showed that the group undergoing early mobilization experienced faster peristalsis recovery compared to the group that did not mobilize early (p = 0.000). Additionally, other studies indicate that early mobilization prevents post-operative ileus by enhancing intestinal peristalsis and reducing the time to first flatus and defecation (Barba et al., 2024). The mechanisms by which early mobilization promotes intestinal peristalsis include: Stimulating the enteric nervous system, which coordinates intestinal peristalsis. Reducing immobilization effects, which can slow bowel movement, especially after anesthesia or abdominal surgery. Increasing intra-abdominal pressure, which can stimulate intestinal activity, helping to expel gas and prevent ileus.Coffee Consumption to Accelerate Gastrointestinal Recovery. Based on two analyzed studies, coffee consumption has been shown to accelerate gastrointestinal function recovery after gynecological surgeries and cesarean sections. Several mechanisms explain these positive effects: Stimulation of intestinal motility (soffee increases gastrin release, which stimulates colonic motor activity). Adenosine receptor antagonism (coffee inhibits adenosine, a compound that naturally suppresses gastrointestinal motility). Effects on the autonomic nervous system (coffee helps restore the balance between the sympathetic and parasympathetic nervous systems after surgery, preventing post-operative ileus) (Gungorduk et al., 2020; Zamanabadi et al., 2021). Clinical Implications is findings suggest that coffee can serve as a simple, cost-effective, and efficient intervention in post-operative recovery protocols for patients undergoing gynecological surgery and cesarean sections. Importantly, no significant adverse effects were reported in the studies, supporting the idea that coffee is a safe method to enhance post-operative gastrointestinal recovery.

CONCLUSION

Based on the discussion and literature analysis, non-pharmacological interventions such as warm compress therapy and early mobilization have been proven effective in enhancing intestinal peristalsis and alleviating bloating and gastrointestinal distension. These methods are not only safe but also easy to implement in clinical care, particularly for post-operative patients. Therefore, the application of these interventions is highly recommended in medical practice to improve patient quality of life and accelerate gastrointestinal function recovery.

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