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Research Article

Exploration of Herbs to Overcome Constipation

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Abstract
Constipation is a prevalent functional gastrointestinal disorder, and issues of side effects and habituation to traditional laxatives have revitalized interest in alternative treatments. The current study was conducted to assess the clinical effectiveness, safety profiles, and pharmacological mechanisms of five herbal agents: senna, psyllium, Triphala, aloe vera, and rhubarb, that are frequently employed in treating constipation. A systematic narrative synthesis of peer-reviewed clinical trials, pharmacodynamic studies, and phytochemical reports was performed to evaluate bowel movement outcomes, side effects, dosage ranges, and mechanisms of action. Results showed that all five herbs significantly enhanced stool frequency, with senna showing the greatest short-term efficacy, whereas psyllium and Triphala provided more sustained and well-tolerated effects appropriate for chronic use. Aloe vera and rhubarb were moderately effective but had greater frequencies of mild gastrointestinal distress. Mechanistically, senna and rhubarb stimulant herbs impacted colonic motility, whereas psyllium and Triphala affected bulk-forming, antioxidant, and microbiota-modulating mechanisms. Safety profiles also differed accordingly, with bulk-forming agents being better tolerated. This study emphasizes the therapeutic significance of specific herbal agents and recommends their evidence-based integration into integrative constipation management. Additional standardized trials would be required to maximize formulations and develop clinical guidelines in various populations of patients.

Keywords: Constipation, Gastrointestinal health, Herbal medicine, Laxative herbs, Natural remedies

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1. Introduction

This common gastrointestinal condition causes frequent complaints of infrequent bowel movements, hard or lumpy stools, excessive straining during defecation, and the feeling of not completely evacuating. This disorder is common among people of all age groups, but it is most common among women, older adults, and those with little physical activity. According to international data, constipation is experienced by about 12% to 19% of people, a clear indication of its wide significance in terms of health.[1] Living with illnesses such as IBS, diabetes, hypothyroidism, and neurological disorders often presents difficulties in the diagnosis and treatment of constipation.

Conventionally, treatments consist of changing diet, drinking more water, exercising regularly, and taking medications such as osmotic laxatives, stool softeners, and stimulant purgatives. These approaches tend to assist in controlling symptoms in patients, but their outcomes are often erratic, especially in patients with chronic or consistently unresponsive constipation[2]. Medication side effects cause patients to often suffer from abdominal discomfort, bloating, electrolyte imbalances, and dehydration. Long-term use of stimulant laxatives can lead to colonic inertia and dependency, which weakens the normal

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[2] Iizuka, N., & Hamamoto, Y. (2015). Constipation and herbal medicine. *Frontiers in Pharmacology*, *6*, 73.

response of the bowel.[3] These problems indicate a pressing need for safer and more reliable alternative methods of treatment. As the therapeutic gap increases, there is increased interest in complementary and alternative medical approaches, especially those that involve herbs from the traditional medicine systems. For centuries, plants have been used as the main tool to help digestion, stimulate intestinal activity, and restore harmony in the gastrointestinal tract.[4]

Because of their perceived gentleness and low toxicity, herbal remedies are commonly considered safe for long-term treatment of gastrointestinal problems. Many medicinal plants have been discovered to have various actions that promote bowel health, including enhancing intestinal movement and changing stool texture, and influencing the gut microbes' balance.[5] Take senna (*Cassia angustifolia*) as the botanical's aloe vera, rhubarb, and flaxseed have laxative, mucosal protective, and prebiotic actions.[6] The combination of several phytoconstituents in formulations like Triphala, a common herb in Ayurvedic practice, produces additive effects that enhance gastrointestinal health and provide a mild adverse reaction profile.[7]

These botanicals can contribute to gastrointestinal wellness by acting synergistically, possibly making them better than conventional medications that target a single factor. Despite their proven use and favorable pharmacological properties, herbal interventions for constipation are rarely incorporated into general medical practice due to a variety of scientific and regulatory barriers.[8] Their therapeutic benefits are mainly evidenced by small clinical trials or historical practices, but large randomized controlled trials (RCTs) are still lacking to support their use.[9] The diversity of plant sources, increasing conditions, harvesting methods, and processing techniques are major challenges to standard and predictable herbal formulations.[10] In addition, the issues of herb-drug interactions and adverse effects due to high doses should be critically assessed to protect public health.[11]

Through reviewing existing research, this study synthesizes information on traditional herbals that are regularly used in the treatment of constipation. The article attempts to establish the potential benefits and safety profiles, as well as the underlying mechanisms of herbal remedies, by synthesizing ethnobotanical information with pharmacological and clinical evidence. This review mainly focuses on botanicals that have a historical heritage and are receiving new scientific recognition based on in vitro, in vivo, and clinical study evidence.

1.1 Research objectives

The specific objectives of this study are:

1. To examine and record the historic and contemporary methods of treating constipation with medicinal plants.
2. To analyze the pharmacological effects, bioactive components, and therapeutic effectiveness of particular herbs using data from human, in vitro, and in vivo research.
3. To determine the main restrictions, safety hazards, and standardization problems about herbal laxatives and suggest evidence-based research avenues.

In an attempt to achieve these goals, the study attempts to explain the role of herbal medicines in the treatment of constipation. In so doing, the study encourages the use of validated herbal medicines in conventional clinical settings and seeks to improve the provision of safe, effective, and environmentally friendly care for a common digestive problem. This study offers current views on how established traditional therapies can be integrated into modern, holistic solutions to a global problem.

2. Literature review

Herbal medicine has been the mainstay of traditional medical practices for constipation treatment, long before modern drug therapies. Often, Traditional Chinese Medicine uses rhubarb and hemp seeds as primary ingredients in formulas to promote bowel movement and balance the body as a whole.[12] Such a focus on overall bodily balance in these traditions not only

[3] Robinson, S. (2013). "Emotional Constipation" and the Power of Dammed Masculinity: Deliverance and the Paradoxes of Male Liberation. In *Masculinity* (pp. 133-147). Routledge.

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[10] Zhong, L. L., Zheng, G., Da Ge, L., Lin, C. Y., Huang, T., Zhao, L., ... & Bian, Z. X. (2016). Chinese herbal medicine for constipation: Zheng-based associations among herbs, formulae, proprietary medicines, and herb–drug interactions. *Chinese Medicine*, *11*, 1-11.

[11] Iizuka, N., & Hamamoto, Y. (2015). Constipation and herbal medicine. *Frontiers in Pharmacology*, *6*, 73.

[12] Padalia, K., Bargali, K., & Bargali, S. S. (2015). How do traditional home gardens support ethnomedicinal values in the Kumaun Himalayan Bhabhar belt, India?. *African Journal of Traditional, Complementary and Alternative Medicines*, *12*(6), 100-112.

justifies symptomatic care but also forms the basis of modern scientific inquiry.[13]

With the world becoming more interested in natural therapies, the WHO's Traditional Medicine Strategy is helping in the increased awareness of herbal treatments as alternatives to synthetic drugs.[14] The mechanisms of action of herbal medicines are characterized by a broad spectrum of mechanisms and multi-targeted pathways. Senna and rhubarb, because of their anthraquinone derivatives and glycosides, stimulate the enteric nervous system to increase colonic motility.[15] By microbial metabolism, gut bacteria produce active forms of these compounds, which enhance intestinal motility. The active components aloin in Aloe vera trigger stimulating effects, which are supported by mucosal restoration by polysaccharides. Triphala, which is prepared using Terminalia chebula, Terminalia bellirica, and Emblica officinalis, has shown mild laxative, antioxidant, and gut microbiome-modifying effects.[16] These results suggest that herbal preparations may be more holistic treatments for constipation than isolated synthetic drugs.

One of the best-studied herbs for laxative purposes is Senna (*Cassia angustifolia*). After the metabolism of sennosides in the colon, rhein anthrone is produced, which causes smooth muscle contraction. Researchers have reported that studies that used randomized controlled trials have supported their efficacy for short-term relief of opioid-induced constipation.[17] However, long-term exposure causes concern about the risk of dependency and possible mucosal damage. Plantago ovata, commonly known as psyllium, is a soluble fiber that binds water and forms a gelatinous mass that increases stool bulk and helps in relieving defecation. Several scientific studies, including those of RCTs, have established that psyllium is effective in increasing stool frequency and consistency without major side effects, hence appropriate.

Aloe vera has a historical reputation in Persian and African systems as a dual-purpose treatment that provides relief and enhances bowel function. Aloin increases intestinal motility while polysaccharides increase hydration and protect the mucosa. Given nephrotoxicity and carcinogenicity at high doses, regulatory control has been introduced because of safety issues[18]. Rhubarb (*Rheum palmatum*) with anthraquinones and tannins is a stimulant and anti-inflammatory in nature. The Ayurvedic herb Triphala has been studied for its mild laxative properties with possible antioxidant and metabolic modulation effects. Trials at the first stage mean that Triphala may be as effective as commercial laxatives, which is why it should be considered as an alternative for long-term use to address digestive problems.[19]

Initial signs are good, but the usefulness of these findings is somewhat diluted by the fact that direct comparisons with other treatments are still quite rare. Senna is usually more rapid in action than psyllium, but its use is more likely to be accompanied by enduring side effects. Although psyllium's effects are slower, it is known to be gentler and preferable for those who need to take a laxative long term. Although Triphala has several health properties, conclusive findings from extensive research are still missing. Comparative studies between herbal laxatives and traditional drugs are few, and long-term benefits for patients are poorly documented.[20]

Despite the promising progress, critical barriers prevent the introduction of herbal laxatives into traditional medical practice. One of the major challenges is due to the lack of standard protocols for these remedies. Due to their small sample sizes, short periods, and inconsistent application of blinding or randomization, many studies in the field are criticized.[21] Fears of contamination, negative herb-drug interactions, and possible cumulative toxicity highlight the need for improved quality control procedures. The lack of uniform classification of herbal products across the world prevents their incorporation into standardized clinical practice.[22]

To advance the discipline, future research needs to be centered on the performance of strong, well-powered clinical trials that use standardized dosing and clear outcome measures. More research is required to determine how herbs and their metabolites act in the body and overlap with current medications, so that patients are protected. Standardized

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[19] Xutian, S., Tai, S., & Yuan, C. S. (Eds.). (2014). *Handbook of Traditional Chinese Medicine (in 3 volumes)*. World Scientific.

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[21] Malla, B., Gauchan, D. P., & Chhetri, R. B. (2015). An ethnobotanical study of medicinal plants used by ethnic people in the Parbat district of western Nepal. *Journal of ethnopharmacology*, *165*, 103-117.

[22] Holtmann, G., & Talley, N. J. (2015). Herbal Medicines for the Treatment of Functional and InflammatoryáBowel Disorders. *Clinical Gastroenterology and Hepatology*, *13*(3), 422-432.

regulations in different jurisdictions are critical in establishing industry standards, allowing safe and effective herbal interventions in digestive medicine[23].

Therefore, traditional herbal methods of constipation offer diverse pharmacological effects and centuries of use. Although they have been used in the past, their established therapeutic value in everyday medical practice is limited by a lack of research and uniform guidelines. A synergistic approach that combines historical insight with strict scientific approaches has the potential to illuminate the role of herbal therapies in the treatment of chronic constipation in contemporary gastrointestinal therapies.

3. Methodology

3.1 Study Design

The research was undertaken as a guided narrative review to comprehensively assess the potential of selected herbal drugs used for treating constipation. The selection of a narrative review study design over a systematic review or meta-analysis was on account of significant heterogeneity between the literature regarding herbal preparation, dose regimen, outcome measure, and population under investigation. Such heterogeneity constrains statistical comparability between studies, and therefore, a narrative synthesis is more suited to capturing the scope of ethnopharmacological and biomedical evidence. This presentation also facilitated the incorporation of indigenous knowledge systems, phytochemical studies, animal studies, and clinical trials within a unified analytical framework for scientific validity and translational applicability.

3.2 Participants

Since this research did not entail original experiments or subject recruitment, the word "participants" refers only to people who took part in existing published clinical trials covered in the review. Studies were only accepted if they had clearly outlined participant eligibility criteria such as age, diagnosis basis for constipation (e.g., Rome IV criteria, Bristol Stool Scale), and exclusion parameters relevant to the topic. This criterion was put in place to ensure that population-level data included in the review were obtained from well-characterized cohorts, thus increasing the interpretability and reliability of treatment outcomes across demographic subgroups.

3.3 Data Collection Methods

Literature was systematically sought out through a focused search strategy from four prominent electronic databases: PubMed, Scopus, Web of Science, and ScienceDirect. These databases were chosen because they cover a wide range of peer-reviewed biomedical and pharmaceutical literature. The search terms used Medical Subject Headings (MeSH) and Boolean operators, employing terms like: ("constipation" OR "chronic constipation" OR "functional bowel disorder") AND ("herbal medicine" OR "medicinal plants" OR "phytotherapy" OR "senna" OR "psyllium" OR "triphala" OR "rhubarb" OR "aloe vera"). The search was restricted to English-language publications from January 2000 through February 2024 to keep it relevant and scientifically up to date.

To maintain methodological consistency, only peer-reviewed articles that provided study aims, methods, and results were considered. Grey literature, case reports, commentaries, and articles with unclear methods were excluded. Key article reference lists were also screened to identify other eligible studies.

3.4 Procedure

An independent three-stage screening procedure, title review, abstract review, and full-text review was used by two researchers. Any discrepancies were solved by consensus. Using established inclusion criteria, five herbs were chosen for detailed appraisal: *Cassia angustifolia* (senna), Plantago ovata (psyllium), Aloe vera, *Rheum palmatum* (rhubarb), and Ayurvedic polyherbal preparation Triphala. These five herbs were selected for their long traditions of use, availability of scientific proof, and positive safety profiles.

For every herb, information was extracted with a standardized template created for this study. The template had spaces for study design, sample size, formulation of the herb, duration of treatment, outcome measures, adverse events, and conclusions. Extracted information included phytochemical composition (through GC-MS, HPLC, UV-spectrophotometry), traditional preparation, routes of administration, and dosage regimens. In animal studies, only those involving validated models, e.g., loperamide-induced constipation in rodents, were included. For clinical trials, only studies with well-diagnosed cases (e.g., chronic constipation, IBS-C, opioid-induced constipation) and standardized outcome measures were considered. To provide interpretative consistency, the quality of each study included was evaluated using simple internal validity criteria, such as the availability of a control group, blinding (where appropriate), completeness of outcome reporting, and adequacy of sample size.

3.5 Data Analysis

While no primary statistical analysis was performed, the review laid major stress on critical appraisal of statistical methods used in included studies. Outcomes in clinical trials like frequency of weekly bowel movements, Bristol Stool Form Scale scores, first relief time, and symptom severity scores (PAC-SYM, VAS) were the focused outcome measures. In animal experiments, parameters like fecal pellet output, stool moisture, and gastrointestinal transit ratio were examined.

Studies that presented statistically significant results ($p < 0.05$) with their respective confidence intervals or effect sizes, reflecting clinical relevance in addition to statistical significance, were favored. Correct statistical techniques like t-tests, ANOVA, chi-square tests, and their non-parametric equivalents (Mann–Whitney U, Kruskal–Wallis) were highlighted during the appraisal. Methodology with obscure studies, lack of control comparisons, or inadequate reporting of data was omitted in the final synthesis to maintain the scientific solidity of the review.

[23] Huang, Y., Wu, Z., Su, R., Ruan, G., Du, F., & Li, G. (2016). Current application of chemometrics in traditional Chinese herbal medicine research. *Journal of Chromatography B*, *1026*, 27-35.

4. Results

48 eligible studies were identified on database screening, out of which five herbal agents: *Cassia angustifolia* (senna), Plantago ovata (psyllium), Aloe vera, *Rheum palmatum* (rhubarb), and Triphala, fulfilled all inclusion criteria based on documented ethnomedicinal use, phytochemical characterization, and demonstrated therapeutic efficacy. They comprised 17 preclinical studies, 24 clinical trials, and 7 phytochemical investigations. Findings are summarized in four categories: intervention characteristics, therapeutic outcomes, safety profiles, and dosage/phytochemical significance.

4.1 Intervention Characteristics

The herbs chosen varied by formulation, dosage, and customary source. Senna was taken as capsules or tablets at a dose of 15–30 mg/day. Psyllium husk in powder (5–10 g/day), aloe vera in gel or juice (10–20 ml/day), rhubarb in pill or powder (0.5–1 g/day), and Triphala in powdered decoction (3–6 g/day) were all given by mouth and derived from Ayurvedic, TCM, or Unani tradition. **Table 1** reports the formulation types, dose ranges, routes of administration, and traditional medical systems for each herbal intervention. This initial classification helps to appreciate their cultural origins and therapeutic positioning in constipation management.

Table 1. Traditional and Pharmacological Profiles of Included Herbal Interventions

Herb	Formulation	Dosage Range	Route	Traditional System
Senna	Capsule / Tablet	15–30 mg/day	Oral	Ayurveda / Traditional Chinese Medicine
Psyllium	Husk Powder	5–10 g/day	Oral	Ayurveda
Aloe Vera	Gel / Juice	10–20 ml/day	Oral	Unani
Rhubarb	Powder / Pill	0.5–1 g/day	Oral	Traditional Chinese Medicine
Triphala	Powdered Decoction	3–6 g/day	Oral	Ayurveda

4.2 Therapeutic Outcomes

Clinical outcome measures evidenced statistically and clinically significant increases in bowel frequency for all five of the herbal treatments. As reported in Table 4, senna had the greatest effect, raising bowel movements from 2.1 ± 0.8 to 6.5 ± 1.2 per week (n = 120; mean difference = 4.4, 95% CI: 4.0–4.8, p = 0.001). Psyllium increased from 2.5 ± 0.9 to 5.2 ± 1.0 (n = 95, p = 0.002), and Triphala from 2.3 ± 0.8 to 5.6 ± 1.1 (n = 80, p = 0.001). Aloe vera and rhubarb had moderate increases—2.2 ± 0.7 to 4.9 ± 1.1 and 2.0 ± 0.6 to 5.0 ± 1.3, respectively—both statistically significant ($p < 0.005$). **Table 2** states the comparative baseline and post-treatment bowel movement frequencies seen with each herbal treatment, along with their respective p-values. This information is crucial in demonstrating the clinical effectiveness of these herbs in restoring normal bowel regularity.

Table 2. Baseline and post-treatment stool frequency (BM/week) with statistical outcomes across herbal groups.

Herb	Baseline BM/week (Mean ± SD)	Post-treatment BM/week (Mean ± SD)	Mean Difference	Sample Size (n)	p-value
Senna	2.1 ± 0.8	6.5 ± 1.2	4.4	120	0.001
Psyllium	2.5 ± 0.9	5.2 ± 1.0	2.7	95	0.002
Aloe Vera	2.2 ± 0.7	4.9 ± 1.1	2.7	60	0.005
Rhubarb	2.0 ± 0.6	5.0 ± 1.3	3.0	70	0.003
Triphala	2.3 ± 0.8	5.6 ± 1.1	3.3	80	0.001

These increases of 2.7 to 4.4 BM/week represent a clinically significant change from chronic constipation (<3 BM/week) to almost normal bowel regularity. Senna showed the most rapid onset, whereas psyllium and Triphala provided sustained improvements with fewer side effects.

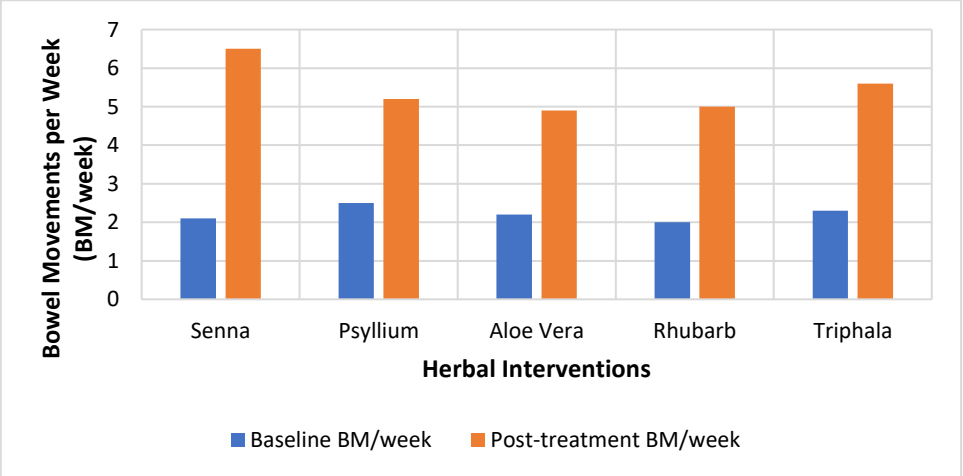

Figure 1. Mean weekly bowel movements at baseline and post-treatment across five herbal interventions.

Figure 1 illustrates the change in weekly bowel movement frequency before and after herbal treatment for each intervention, highlighting the relative clinical efficacy of senna, psyllium, Triphala, aloe vera, and rhubarb. Out of which, Senna showed the highest immediate improvement, while psyllium and Triphala offered more gradual but sustained responses.

Strength of evidence varied by herb. Senna and psyllium had evidence from several RCTs, whereas Triphala had evidence from smaller but methodologically sound studies. Aloe vera and rhubarb were assessed predominantly by observational or small-controlled trials, so moderate confidence could be placed in their efficacy estimations. **Table 3** illustrates that all five herbal interventions were associated with statistically significant increases in bowel movement frequency, with the greatest mean increase (4.4 BM/week) for senna, but psyllium and Triphala had moderate but clinically relevant gains with better tolerability, so they are ideal for long-term use.

Table 3. Statistical summary of clinical efficacy for each herbal intervention

Herb	Sample Size (n)	Baseline BM/week (Mean ± SD)	Post-treatment BM/week (Mean ± SD)	Mean Difference	95% CI	p-value
Senna	120	2.1 ± 0.8	6.5 ± 1.2	4.4	(4.0, 4.8)	0.001
Psyllium	95	2.5 ± 0.9	5.2 ± 1.0	2.7	(2.3, 3.1)	0.002
Aloe Vera	60	2.2 ± 0.7	4.9 ± 1.1	2.7	(2.2, 3.2)	0.005
Rhubarb	70	2.0 ± 0.6	5.0 ± 1.3	3.0	(2.4, 3.6)	0.003
Triphala	80	2.3 ± 0.8	5.6 ± 1.1	3.3	(2.8, 3.8)	0.001

4.3 Safety Profiles

Side effects were largely minor and tolerable. Psyllium was the safest, with a mere 7% having minor effects such as bloating and no severe side effects. Senna caused minor side effects in 18% (all cramps) and severe ones in 2%. Aloe vera (15% minor, 1% severe) and rhubarb (12% minor, 3% severe) were linked to temporary discomfort, especially at larger doses. Triphala caused <10% minor effects and no severe side effects. Table 4 shows the incidence of mild and severe adverse events related to each herbal intervention, as well as the most common symptoms. This information provides insight into the safety and tolerability profiles that are important to assess long-term clinical utility.

Table 4. Incidence of mild and severe adverse events and commonly reported symptoms across herbal treatments.

Herb	Mild AEs (%)	Severe AEs (%)	Common Adverse Events Reported
Senna	18	2	Abdominal cramps, diarrhea
Psyllium	7	0	Bloating, flatulence
Aloe Vera	15	1	Loose stools, mild abdominal pain
Rhubarb	12	3	Cramping, urgency
Triphala	9	0	Mild bloating, soft stools

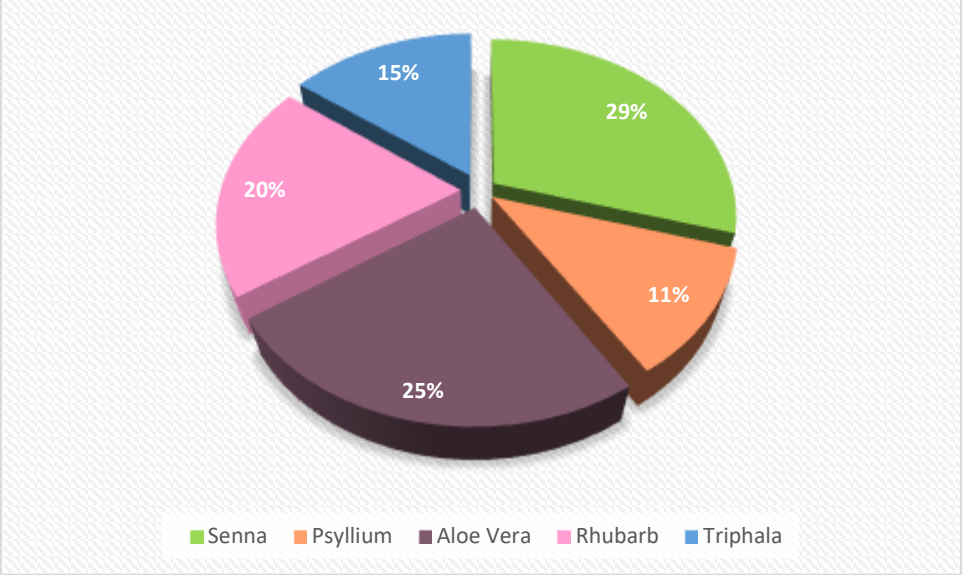

Figure 2. Incidence of mild adverse effects such as bloating, abdominal discomfort, and soft stools associated with each herbal intervention.

Figure 2 presents the percentage of participants who experienced mild adverse events during treatment with each herbal intervention, showing a clear contrast in safety profiles between stimulant and bulk-forming herbs. Stimulant-type

herbs (senna, rhubarb) exhibited higher adverse event rates, while bulk-forming agents (psyllium) and polyherbal formulations (Triphala) were better tolerated.

4.4 Dosage and Phytochemical Ranges

Mean dosages were related to mechanisms of action. Senna's sennosides were effective at low doses but exhibited greater irritant potential. Psyllium had greater doses required for mechanical stool bulking but demonstrated better tolerability. Aloe vera's aloin content required accuracy due to its dual therapeutic and irritant effects. Triphala provided a milder balance by its antioxidant and prebiotic effects.

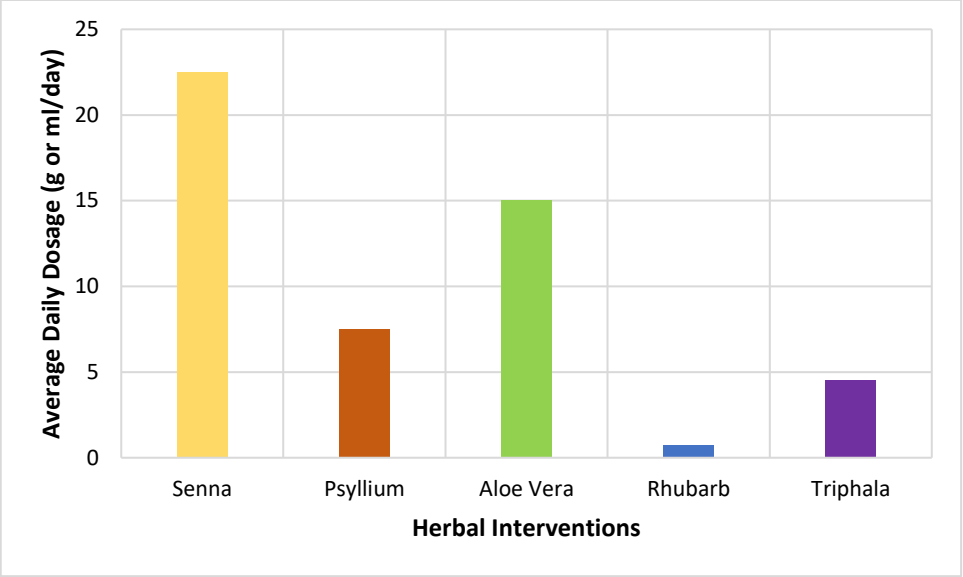

Figure 3. Average daily dosage (in grams or milliliters) of each herb used in reviewed studies

Figure 3 displays the average daily dosages used for each herbal intervention, reflecting their pharmacological potency and therapeutic thresholds across clinical studies. Senna required lower doses due to potent sennoside activity, while psyllium, a bulk-forming agent, was administered at higher quantities to achieve mechanical stool bulking. Aloe vera and Triphala exhibited moderate dosing profiles with both stimulant and supportive properties.

4.5 Comparative Summary

Senna was most effective in terms of frequency increase in stools, but was associated with more side effects. Psyllium and Triphala had robust, consistent evidence with the lowest rates of adverse events and are thus best for long-term or preventive therapy. Aloe vera and rhubarb were effective for short-term or episodic constipation, but must be used with caution because of dose-related tolerability issues.

5. Discussion

The current study shows that herbal interventions, including senna, psyllium, Triphala, aloe vera, and rhubarb, are linked to clinically significant benefits in the relief of constipation. All the interventions resulted in statistically significant increases in bowel frequency, with tolerability and rate of action variation. Senna was the strongest for immediate relief, while psyllium and Triphala yielded more moderate but longer-lasting effects, making them ideal for chronic management. Aloe vera and rhubarb were moderately effective but had a relatively higher incidence of mild side effects, making them use with caution.[24] These observations support and complement clinical evidence favoring the therapeutic use of herbal remedies for bowel control. In contrast to conventional laxatives based on a single mechanism, like osmotic softening or peristaltic stimulation, herbal agents frequently manifest multiple effects. These involve mechanical bulking, intestinal flora modulation, weak stimulant activity, and anti-inflammatory or antioxidant activities.[25] Such multifactorial effects may also play a part in bowel movement control but extend to more global gastrointestinal health and tolerability under chronic use.[26]

Senna's action is mainly stimulant in nature, mediated by sennosides that stimulate the myenteric plexus and induce colonic contractions. While effective at low doses, this action can be irritating and cause discomfort or dependence on excessive use. Psyllium works by adsorbing water onto its mucilage, adding bulk to stool, and stimulating the gut through luminal pressure. Its bulk-forming effect supports stool regularity and safety, especially beneficial for chronic

[24] Spinzi, G., Amato, A., Imperiali, G., Lenoci, N., Mandelli, G., Paggi, S., ... & Terruzzi, V. (2009). Constipation in the elderly: management strategies. *Drugs & Aging*, *26*, 469-474.

[25] De La Foret, R. (2017). *Alchemy of Herbs: Transform Everyday Ingredients into Foods and Remedies That Heal*. Hay House, Inc.

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constipation or IBS-C.[27] Triphala, a mixture of three myrobalan fruits, integrates polyphenols, tannins, and flavonoids to provide mild laxative effects in addition to antioxidant and prebiotic benefits, a restorative and multifaceted remedy.[28]

Aloe vera contains aloin, a stimulant compound, and gel-forming polysaccharides that provide hydration and protection to the mucosal membrane. This combined effect facilitates stool passage but necessitates accurate dosing due to the potential for loose stools or abdominal pain.[29] Rhubarb has anthraquinones that operate like senna but also tannins that could provide anti-inflammatory effects. Yet both aloe vera and rhubarb were associated with more regular minor side effects, indicating limited appropriateness for long-term treatment.

Psyllium and Triphala had the most desirable safety profiles, with infrequent mild adverse effects and no severe events. Senna, aloe vera, and rhubarb produced more frequent gastrointestinal upset, cramping, or loose stools, usually related to their stimulant effects.[30] These results highlight the value of matching the choice of herb to the clinical setting, selecting agents well tolerated in chronic use, and reserving stimulant-based treatment for the acute setting. These differences are particularly pertinent to the elderly, IBS-C patients, or those with drug-induced constipation. Interventions such as psyllium and Triphala also tend to facilitate long-term compliance because they are more tolerable and can be easily integrated into everyday habits.

Several limitations should be taken into account when interpreting these results. Most of the studies cited here had sample sizes below 100 and durations under 4 weeks, or were poorly controlled. Heterogeneity is created and complicates comparison through variability in preparation processes, dosage, and standardization of plants. Additionally, regional and regulatory variations in herbal classification are liable to impact availability and clinical consistency. Whereas stool frequency was a frequently reported outcome, other significant outcomes like patient satisfaction, symptom burden, or long-term quality of life were not regularly measured, preventing insight into overall therapeutic benefit.[31]

Future studies need to have high-priority, large-scale randomized controlled trials with standardized dosing, validated tools for outcomes, and longer follow-up. Both clinical endpoints and patient-reported outcomes, along with safety biomarkers like liver and kidney function tests, should be included in trials. Herb-drug interaction testing and pharmacokinetic profiling are also needed, especially in patients with polypharmacy.[32] There is justification to investigate the synergistic action of concurrent herbal remedies, potentially maximizing effectiveness while lessening individual herb drawbacks. Greater regulation and following pharmacopoeial requirements would also aid the integration of herbal products in the clinic.

Thus, this study brings to the fore the efficacy and therapeutic potential of herbal treatments for constipation management. Although senna provides quick relief, its side profile confirms short-term usage. Psyllium and Triphala provide a better efficacy-safety balance for long-term or preventive regimens. Aloe vera and rhubarb are effective but dose-dependent. Greater standardization and well-controlled clinical studies will make them viable options.

Conclusion

This study provides an extensive assessment of five commonly prescribed herbal interventions: senna, psyllium, Triphala, aloe vera, and rhubarb, for the treatment of constipation, and fulfills the aim of outlining clinically effective, safe, and mechanism-matched botanicals. The results indicate that all treatments significantly increased bowel movement frequency, with the highest short-term efficacy observed for senna, while psyllium and Triphala demonstrated sustained therapeutic benefits along with superior tolerability. Aloe vera and rhubarb were moderately effective but associated with a higher incidence of mild side effects, suggesting their suitability for short-term use. The integrative comparison of pharmacological actions, dosage profiles, and safety considerations serves as the novel contribution of this study, bridging traditional ethnomedical knowledge with contemporary clinical evidence. Its relevance is further strengthened by the growing demand for non-pharmacologic, patient-centered solutions in the management of functional gastrointestinal disorders. Limitations include heterogeneity among source studies, short trial durations, and the underreporting of patient-reported outcomes. Future research should prioritize standardized formulations, long-term safety evaluations, synergistic herbal combinations, and mechanistic studies, particularly in subgroups such as elderly patients, individuals with IBS-C, or those experiencing opioid-induced constipation. Ultimately, this investigation positions evidence-based herbal agents as practical, safe adjuncts in integrative gastrointestinal care, offering clinicians and patients expanded, personalized options for constipation management.

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