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Research Article

HARNESSING YOGA AND NATUROPATHIC NUTRITION FOR CONSTIPATION MANAGEMENT: AN OBSERVATIONAL STUDY

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ABSTRACT

Chronic constipation is a prevalent gastrointestinal disorder associated with infrequent or difficult bowel movements and reduced quality of life. Pharmacological options often provide limited long-term relief and carry adverse effects. This study evaluated an integrative approach combining naturopathic dietary modifications and yoga-based practices. **Materials and Methods:** Thirty adults with clinically diagnosed chronic constipation underwent a 90-day intervention comprising fibre-rich dietary counselling and structured yoga practices aimed at improving gastrointestinal motility and abdominal function. Outcomes were assessed using the Patient Assessment of Constipation Symptoms (PAC-SYM), Constipation-Related Quality of Life Questionnaire (CRQOL), and Modified Bristol Stool Scale (MBSS). Statistical analyses included paired t-tests and repeated measures ANOVA. **Results:** Marked improvements were observed across all domains. PAC-SYM scores declined by 42.5% (10.62±1.80 to 6.10±1.17; $p<0.0001$, $d=4.467$), indicating reduced symptom severity. CRQOL scores improved by 45.2% (99.03±7.45 to 54.31±5.58; $p<0.0001$, $d=11.963$), reflecting better physical comfort and psychosocial well-being. MBSS outcomes demonstrated a 46.6% reduction in constipation burden (14.99±0.61 to 8.00± 0.50; $p<0.0001$, $d=15.873$), with stool consistency approaching normal. Large effect sizes ($\eta^2=0.68–0.88$) confirmed robust treatment effects. No adverse events or dropouts occurred. **Conclusion:** An integrative regimen of yoga and naturopathic dietary modification significantly alleviated symptoms, normalized stool patterns, and enhanced quality of life in chronic constipation. This safe, non-pharmacological approach may serve as an effective alternative or complement to conventional therapy, warranting validation through larger randomized controlled trials.

INTRODUCTION

Constipation is one of the most common gastrointestinal complaints, often described as infrequent, difficult, or incomplete evacuation of stool [1]. Clinically, it is defined as having fewer than three bowel movements per week, usually accompanied by straining, passage of hard or lumpy stools, or a persistent feeling of incomplete evacuation or blockage at the anorectal outlet[2].

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The condition carries a considerable global health burden, with prevalence estimates ranging between 2% and 27% depending on population groups, and it tends to affect women and older adults more frequently [3]. The disorder largely arises from delayed colonic transit and impaired neuromuscular coordination, which lead to excessive reabsorption of water and the accumulation of hard, desiccated stools in the distal colon[1]. In addition to infrequent bowel movements, patients often report abdominal bloating, gas, loss of appetite, fatigue, dull headaches, and in chronic cases, even low back pain[4]. In the United States alone, constipation accounts for more than 2.5 million physician visits annually, underscoring its

healthcare impact[5]. Management typically begins with lifestyle and dietary adjustments- such as increasing fiber and fluid intake, engaging in physical activity, and using over-the-counter laxatives[6,7]. However, many individuals, especially those with chronic idiopathic constipation or motility disorders, fail to achieve lasting relief with these measures [8]. Advances in pharmacotherapy have introduced novel agents, including prucalopride (a selective 5-HT_4 receptor agonist), lubiprostone (a chloride channel activator), and linaclotide (a guanylate cyclase-C agonist), which show greater efficacy compared to traditional laxatives[9–11]. Still, their use is often constrained by variable patient response, gastrointestinal side effects such as nausea or diarrhea, and the high costs of treatment[12]. Other emerging therapies, such as ileal bile acid transporter (IBAT) inhibitors and peripherally acting μ-opioid receptor antagonists (PAMORAs), have shown promise in improving colonic motility and secretion [13]. Early clinical findings are encouraging, but their long-term safety and clinical applicability remain under evaluation[14]. Beyond these challenges, many pharmacological treatments lose effectiveness over time or may lead to dependency, allergies, or systemic side effects[15]. Consequently, there is increasing interest in holistic and integrative strategies that combine dietary herbs, naturopathic nutrition, and lifestyle interventions, particularly within traditional systems such as Ayurveda and naturopathy [16]. Against this background, the present study explores an integrative approach tailored for the Indian population, designed to provide symptomatic relief while also targeting the functional imbalances underlying constipation in a safe, sustainable, and non-pharmacological manner.

METHODOLOGY

Study Site: The study was carried out at two reputed wellness centres in Haridwar, India, both known for their focus on holistic and integrative healthcare. The first site, Patanjali Wellness, located at Patanjali Yogpeeth-II, offers a wide range of naturopathic treatments, Ayurvedic therapies, and yoga-based interventions for chronic health conditions. The second site, Patanjali Yoggram Niramayam, functions as a specialized retreat that provides evidence-based traditional therapies, personalized dietary regimens, and customized yoga sessions, particularly for lifestyle-related disorders.

Study Design: This research followed a cross-sectional observational design and was conducted over a six-month period (180 days). The primary aim was to examine the impact of a combined dietary and yoga-based intervention on patients suffering from chronic constipation.

Study Population and Sample Size: A total of 30 patients clinically diagnosed with chronic constipation were recruited. They were randomly divided into two groups of equal size:

- **Treatment Group (n=15):** Received a structured diet plan along with yoga practices tailored for bowel health.
- **Control Group (n=15):** Continued with standard care, which included dietary advice and over-the-counter laxatives.

Ethical Considerations: All participants provided written informed consent after being fully briefed on the objectives, procedures, risks, and benefits of the study. Confidentiality and the right to withdraw at any stage were ensured, in line with ethical medical practices.

Eligibility Criteria

Inclusion criteria

- Male and female patients aged 60–70 years.
- Diagnosed with chronic constipation as per Rome IV criteria.
- Willingness to participate and adherence to the study protocol.

Exclusion criteria

- Severe gastrointestinal conditions (e.g., Crohn's disease, ulcerative colitis).
- History of abdominal or stomach cancer.
- Recent abdominal surgery.
- Pregnant or breastfeeding women.

Treatment Protocol

1. Diet Plan: The dietary regimen emphasized a high-fibre, plant-based diet with whole grains, legumes, vegetables, nuts, seeds, and fruits, ensuring daily intake of 25–35 g of fibre. Adequate hydration (8–10 glasses of water per day) was encouraged, supported with herbal teas and vegetable juices. Natural laxative foods such as flaxseeds, psyllium husk, prunes, and figs were incorporated, alongside fermented foods like yogurt and buttermilk to promote a healthy gut microbiome. A detailed meal plan included:

- Morning: Warm lemon water, followed by fruits or soaked nuts.
- Breakfast: Oats porridge or fresh fruit.
- Lunch: Khichdi with salad, or whole wheat chapati with dal and vegetable curry.
- Snacks: Herbal drinks and roasted seeds/nuts.

- Dinner: Vegetable khichdi or steamed vegetables.
- Post-dinner: Herbal teas or dried fruits.

2. *Yoga* Routine: Daily yoga sessions (45–60 minutes) were scheduled in the morning or evening on an empty stomach. The protocol included:

- Warm-up exercises (10 mins): Neck, shoulder, and trunk rotations, gentle stretches.
- *Asanas* (30 mins): *Pawanmuktasana, Trikonasana, Bhujangasana, Dhanurasana, Ardha Matsyendrasana, Uttanasana, Malasana, Paschimottanasana.*
- Pranayama (10 mins): *Kapalbhati* and *Anulom Vilom*.
- Relaxation (5–10 mins): Savasana.

Data Collection

Participants underwent

- Baseline assessment: Medical history, dietary habits, and physical examination.
- Weekly monitoring: Symptom tracking, adherence checks, and side-effect reporting.
- Final assessment: Clinical and self-reported evaluations after six months.

Validated tools were employed for outcome measurement

- PAC-SYM (Patient Assessment of Constipation Symptoms).
- CRQOL (Constipation-Related Quality of Life Questionnaire).
- Modified Bristol Stool Form Scale (MBSS).

Data Analysis: Data were analyzed using SPSS, R, and STATA. Descriptive statistics summarized baseline and outcome variables. Group comparisons were made using independent t-tests or Mann–Whitney U tests, depending on distribution. Secondary outcomes, such as quality-of-life improvements, were assessed using Chi-square tests, ANOVA, and multivariable regression models to control for confounders. A significance level of $p<0.05$ was considered statistically meaningful.

RESULTS

The intervention produced significant and clinically meaningful improvements in patients with chronic constipation. Thirty participants completed the study, and their outcomes were assessed using validated tools, including the Patient Assessment of Constipation Symptoms (PAC-SYM), the Constipation-Related Quality of Life Questionnaire (CRQOL), and the Modified Bristol Stool Scale (MBSS). From baseline to post-intervention, a consistent pattern of improvement was observed across all symptom domains. The frequency of infrequent bowel movements (≥2 per week) reduced markedly, as did episodes of incontinence and excessive stool retention. Painful or hard bowel movements also showed considerable relief, while appetite-related complaints and irritability scores were more than halved. Blood in stool, though less common, declined significantly. Overall, the mean total symptom burden dropped from 22.71 ± 0.46 to 11.86 ± 1.80, indicating nearly a 50% reduction in severity (Table 1).

Functional improvements were further supported by changes in stool consistency. MBSS scores improved from 1.14 ± 0.36, reflecting hard, pellet-like stools, to 2.76 ± 0.54, which corresponds to softer, more normal stool forms. This shift demonstrates enhanced bowel motility and stool hydration. The PAC-SYM scores decreased by 42.5% (10.62 ± 1.80 to 6.10 ± 1.17; $p<0.0001$, Cohen's d = 4.467), confirming a significant reduction in abdominal discomfort, straining, and incomplete evacuation. Similarly, the CRQOL outcomes revealed a 45.2% improvement (99.03±7.45 to 54.31±5.58; $p<0.0001$, Cohen's d=11.963), highlighting notable gains in psychosocial well-being, reduced worries, and improved daily functioning. Among all measures, MBSS showed the most striking effect, with a 46.6% reduction (14.99±0.61 to 8.00±0.50; $p<0.0001$, Cohen's d=15.873), indicating normalization of stool patterns (Figure 1).

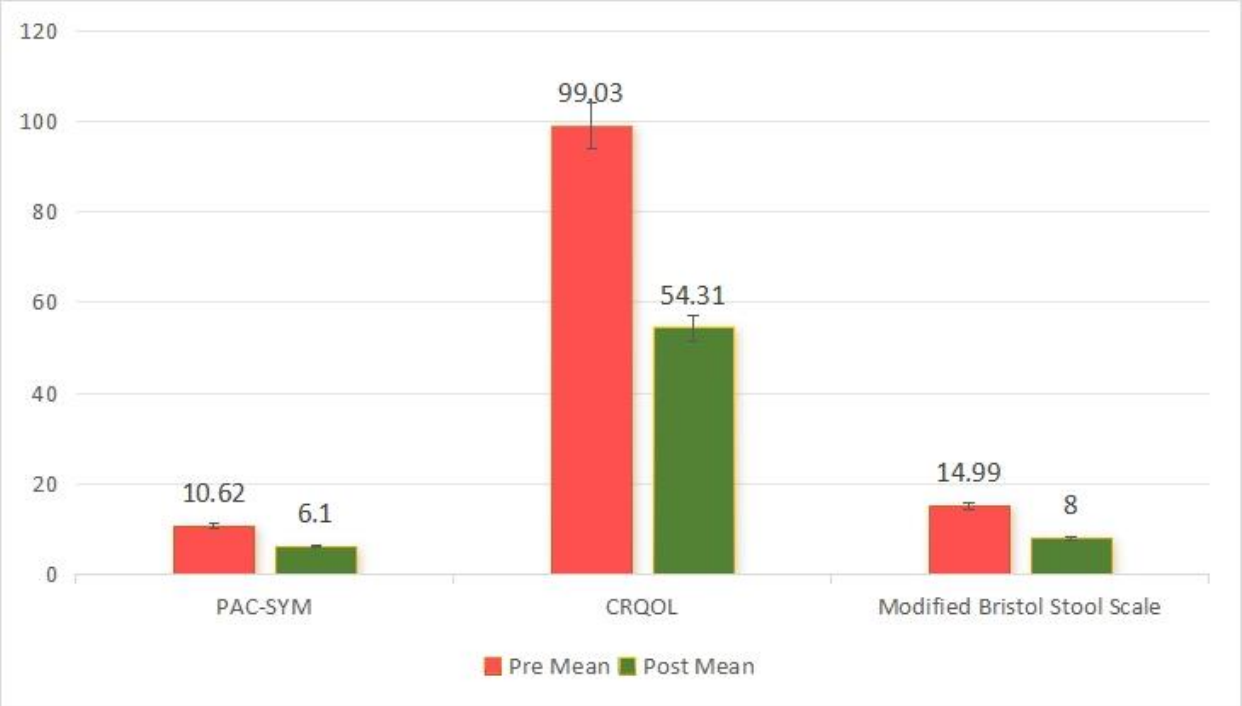

Figure 1: Pre vs Post-Mean Scores Among Constipation Patients

Table 1: Descriptive Statistics of Constipated related symptoms

Variable	Pre Mean ± SD	Post Mean ± SD
2≤BM/wk	3.81 ± 0.40	2.29 ± 0.46
Incontinence ≥1/wk	3.19 ± 0.40	1.90 ± 0.44
Excessive stool retention	3.71 ± 0.46	2.24 ± 0.54
Painful/hard BM	3.62 ± 0.50	2.14 ± 0.36
Appetite	3.14 ± 0.36	1.43 ± 0.60
Irritability relief	3.19 ± 0.40	1.43 ± 0.60
Blood in stool	2.33 ± 0.48	1.05 ± 0.22
Total	22.71 ± 0.46	11.86 ± 1.80
Stool type	1.14 ± 0.36	2.76 ± 0.54

Statistical analysis confirmed the robustness of these findings. Repeated-measures ANOVA showed highly significant improvements across all parameters (p<0.001), with partial eta squared values ranging from 0.68 to 0.88, indicating very large effect sizes (Table 2).

Table 2: RM-ANOVA Results for Pre–Post Comparison

Variable	F-value	p-value	Partial η^2
2≤BM/week	85.23	<0.001	0.75
Incontinence ≥1/week	79.11	<0.001	0.72
Excessive stool retention	92.45	<0.001	0.77
Painful/hard BM	88.72	<0.001	0.76
Appetite	76.34	<0.001	0.70
Irritability relief	80.12	<0.001	0.71
Blood in stool	69.45	<0.001	0.68
Total	210.56	<0.001	0.88
Stool type	95.67	<0.001	0.78

Importantly, no adverse events or treatment-related complications were recorded during the study, and adherence remained excellent, with all participants completing the intervention. The combined regimen of naturopathic dietary modifications and yoga practices led to substantial reductions in constipation-related symptoms, improvements in stool consistency, and enhanced quality of life. The uniformity of outcomes across multiple validated tools highlights the effectiveness of this integrative approach. Furthermore, the absence of adverse events and strong participant adherence underscore its practicality and safety as a sustainable, non-pharmacological management strategy for chronic constipation.

DISCUSSION

Constipation is a globally prevalent gastrointestinal disorder that places a substantial burden on healthcare systems, accounting for nearly 8 to 9 million physician visits annually in developed nations[23]. Its prevalence varies widely, ranging between 12% and 27% depending on geography, diagnostic criteria, and demographic factors[24]. Although constipation can affect all ages and both sexes, it is especially common among women, older adults, non-Caucasian populations, and women during late pregnancy or the postpartum period [25]. When left untreated, chronic constipation is more than a source of discomfort it can lead to complications such as fissures, hemorrhoids, fecal impaction, rectal bleeding, mucosal prolapse, and, in severe cases, ulceration of the colon [26]. For patients with cardiovascular comorbidities, the act of straining can further precipitate hemodynamic stress, increasing risks of arrhythmias or hypertensive crises[27]. Constipation is generally classified into acute, persistent, and chronic forms depending on duration and symptom burden [28]. While acute cases may respond to minor lifestyle changes, chronic constipation often requires sustained management due to its multifactorial pathophysiology. Pharmacological therapies, including bulk-forming agents, osmotic and stimulant laxatives, stool softeners, prokinetics, and newer agents such as intestinal secretagogues or opioid antagonists, are widely prescribed. However, these treatments are often hampered by side effects, limited long-term efficacy, and patient intolerance [29]. This highlights the need for integrative and sustainable approaches that target both symptom relief and the underlying functional disturbances of bowel health [30]. The present study contributes to this growing body of evidence by demonstrating the effectiveness of a structured naturopathic diet and *Yoga* program for chronic constipation. The findings revealed consistent improvements across multiple validated tools PAC-SYM, CRQOL, and MBSS with reductions of 42.5%, 45.2%, and 46.6% respectively. Participants experienced fewer hard and painful bowel movements, improved stool form approaching normal consistency, and substantial gains in quality of life. Importantly, the magnitude of improvement observed exceeded the minimal clinically important difference typically reported in similar populations, underscoring the clinical relevance of the results.

Several mechanisms may explain these outcomes. The high-fiber, plant-based dietary plan likely enhanced stool bulk, improved hydration, and supported the gut microbiome, thereby facilitating easier passage of stools. Natural laxative foods such as flaxseeds, prunes, and psyllium husk may have provided additional relief by softening stool and stimulating peristalsis. Probiotic-rich foods like buttermilk and yogurt supported microbial diversity, which is often disrupted in chronic constipation. On the other hand, yoga practices such as *Pawanmuktasana*, *Dhanurasana*, and *Malasana* are traditionally known to stimulate gastrointestinal motility, strengthen abdominal muscles, and regulate autonomic function. The inclusion of pranayama and relaxation techniques may also have reduced stress-related inhibition of gut motility, thereby complementing dietary benefits. Together, these approaches targeted both the physiological and psychosocial dimensions of constipation. Another strength of this study was the excellent adherence to the intervention, with no adverse events or dropouts reported. This not only reflects the safety and tolerability of the regimen but also its acceptability in real-world clinical practice. Compared with pharmacological options that often lose efficacy over time or pose risks of dependency and side effects [29], the integrative approach here demonstrated durability of effect and a holistic impact on well-being. Overall, the study reinforces the therapeutic value of combining naturopathic diet and yoga as a safe, non-pharmacological strategy for managing chronic constipation. By addressing colonic motility, stool consistency, and psychosocial distress simultaneously, this model offers a comprehensive alternative to conventional treatments. Future randomized controlled trials with larger samples and longer follow-up are warranted to confirm these findings and further elucidate the underlying mechanisms of action.

CONCLUSION

This study offers strong preliminary evidence that a structured program integrating naturopathic dietary modifications and yoga-based practices can serve as a safe, effective, and sustainable strategy for the management of chronic constipation. The intervention not only alleviated symptom severity and improved stool consistency but also enhanced participants' quality of life, reflecting its impact on both physical and psychosocial well-being. Unlike conventional pharmacological options, which are often limited by side effects and declining efficacy, this holistic approach demonstrated consistent improvements without adverse events or dropouts, highlighting its feasibility in real-world settings. Future research should aim to validate these findings through larger randomized controlled trials, incorporating longer follow-up periods to assess durability of effects. Exploring underlying mechanisms such as changes in gut microbiome diversity, gastrointestinal transit dynamics, and stress-related biomarkers would provide deeper insights into how diet and yoga interact to restore bowel health. Establishing standardized protocols for dietary interventions and yoga practices will also be essential for ensuring reproducibility and broader clinical adoption. Taken together, this integrative framework represents a promising non-pharmacological pathway for managing functional gastrointestinal disorders and offers patients a comprehensive, lifestyle-oriented alternative to conventional therapies.

Constraints of Study

This study's findings are promising but limited by the lack of a control group, small sample size, short duration, and reliance on self-reported data. Variations in participant adherence and the absence of objective biomarkers also affect result consistency. Further controlled studies are needed to confirm these outcomes.

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