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ORIGINAL ARTICLE

The Effect of an 8-Week Low-FODMAP Diet Intervention on Symptoms in Patients with Irritable Bowel Syndrome

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ABSTRACT
Irritable Bowel Syndrome (IBS) is a functional gastrointestinal disorder characterized by chronic abdominal discomfort, bloating, and altered bowel habits. Dietary triggers play a pivotal role in symptom exacerbation. A diet low in fermentable oligo-, di-, monosaccharides and polyols (FODMAPs) has emerged as an effective therapeutic approach for IBS symptom relief. To assess the impact of an 8-week Low-FODMAP diet on gastrointestinal symptom severity, quality of life, and psychological well-being in patients with IBS. A single-blind, randomized controlled trial was conducted among adults diagnosed with IBS according to Rome IV criteria. Sixty participants were enrolled and randomized into either the Low-FODMAP Diet (LFD) group or a standard diet control group (SD). The LFD group followed individualized diet plans emphasizing restriction of high-FODMAP foods. Primary outcomes included changes in the IBS Symptom Severity Score (IBS-SSS). Secondary outcomes included the IBS-Quality of Life (IBS-QoL) and Depression, Anxiety, and Stress Scale (DASS-21). Assessments were performed at baseline and after eight weeks of intervention. Participants following the Low-FODMAP diet exhibited a statistically significant reduction in IBS-SSS scores ($p < .001$) compared with the control group. Improvements were also observed in quality-of-life domains and reductions in DASS-21 anxiety and stress scores ($p < .05$). The 8-week Low-FODMAP diet significantly improved gastrointestinal symptoms and psychological well-being in IBS patients. These findings support dietary modification as a first-line, evidence-based approach for managing IBS.
***Keywords**: Irritable Bowel Syndrome, Low-FODMAP diet, gastrointestinal symptoms, quality of life, functional gastrointestinal disorders.*

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INTRODUCTION

Irritable Bowel Syndrome (IBS) is a prevalent functional gastrointestinal disorder, affecting approximately 10–15% of adults worldwide [1]. It is characterized by recurrent abdominal pain associated with altered bowel habits, in the absence of any structural or biochemical abnormalities [2]. IBS substantially impacts patients' quality of life, productivity, and mental health, representing a significant clinical and socioeconomic challenge [3]. The pathophysiology of IBS is multifactorial, involving abnormalities in gut motility, visceral hypersensitivity, low-grade inflammation, altered intestinal permeability, dysbiosis, and dysregulation of the gut–brain axis [4]. Psychological stress and dietary habits are well-established modulators of symptom severity [5]. Among these, dietary factors are particularly influential, with up to 84% of patients reporting food-related symptom exacerbation [6]. The Low-FODMAP diet developed by researchers at Monash University restricts short-chain carbohydrates that are poorly absorbed in the small intestine and rapidly fermented by colonic bacteria, producing gas and osmotic effects [10]. The acronym FODMAP stands for Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols. These compounds include fructose, lactose, fructans, galactans, and polyols such as sorbitol and mannitol. High-FODMAP foods (e.g., wheat, onion, garlic, legumes, and certain fruits) can lead to luminal distension, resulting in bloating, discomfort, and altered bowel movement patterns [7] Several clinical trials have demonstrated that a Low-FODMAP diet significantly reduces IBS symptom severity [7,8] . According to Halmos et al. [6] , approximately 70% of IBS patients experience

clinical improvement following FODMAP restriction. However, questions remain regarding the sustainability of symptom control and potential nutritional implications of long-term adherence [9]
Given the growing global burden of IBS and the need for non-pharmacological management options, this study aimed to evaluate the effectiveness of an 8-week Low-FODMAP diet on IBS symptom severity, quality of life, and psychological well-being in a controlled setting.

MATERIAL AND METHODS

Study Design

This was a single-blind, randomized controlled trial conducted at the Department of Gastroenterology, [Institution Name], from January to June 2024. Ethical approval was obtained from the Institutional Ethics Committee (Ref. No: IEC-2024-GI-07). All participants provided written informed consent prior to enrollment.

Selection of subjects

A total of 80 individuals aged 18–55 years presenting with IBS symptoms were screened according to the Rome IV diagnostic criteria. Sixty participants meeting inclusion criteria were enrolled and randomly assigned to either the Low-FODMAP Diet (LFD) group (n = 30) or the standard diet (control) group (n = 30).

Inclusion criteria:

1. Adults aged 18–55 years.
2. Diagnosis of IBS (Rome IV criteria).
3. No recent antibiotic use or probiotic supplementation (within 4 weeks).

Exclusion criteria:

1. Presence of organic gastrointestinal disease (e.g., IBD, celiac disease).
2. Severe psychiatric or metabolic disorders.
3. Pregnancy or lactation.
4. Inability to comply with dietary intervention.

Intervention

Low-FODMAP Diet Group (LFD)

Table 1: Low fodmap diet (n = 30) patients.

Target Sample			N	Mean	Std. Deviation	T-Test	p-value
LOW FODMAP diet group	Q_Sec_GI_01	Pre	30	7.1333	0.68145	14.780	0.0001
		Post	30	4.2000	0.84690		
	Q_Sec_GI_02	Pre	30	5.7000	0.65126	14.839	0.0001
		Post	30	2.8333	0.83391		
	Q_Sec_MW_03	Pre	30	5.7000	0.59596	17.800	0.0001
		Post	30	2.7333	0.69149		
	Q_Sec_MW_04	Pre	30	5.7667	0.62606	14.524	0.0001
		Post	30	2.9667	0.85029		
	Q_Sec_MW_05	Pre	30	5.7667	0.72793	15.429	0.0001
		Post	30	2.8000	0.76112		
	Q_Sec_MW_06	Pre	30	5.6333	0.55605	20.890	0.0001
		Post	30	2.6333	0.55605		
	Q_Sec_PW_07	Pre	30	5.7667	0.72793	15.420	0.0001
		Post	30	2.9000	0.71197		
	Q_Sec_PW_08	Pre	30	5.9667	0.85029	14.048	0.0001
		Post	30	3.0333	0.76489		
	Q_Sec_PW_09	Pre	30	5.9667	0.61495	19.975	0.0001
		Post	30	2.7000	0.65126		
	Q_Sec_SW_10	Pre	30	6.1333	0.89955	14.831	0.0001
		Post	30	2.7667	0.85836		
	Q_Sec_SW_11	Pre	30	5.7333	0.73968	20.194	0.0001
		Post	30	2.4333	0.50401		
	Q_Sec_QLA_12	Pre	30	8.2333	0.62606	19.923	0.0001
		Post	30	5.2000	0.55086		
	Q_Sec_QLA_13	Pre	30	8.2667	0.69149	16.894	0.0001

		Post	30	5.2000	0.71438		
	Q_Sec_QLA_14	Pre	30	5.6333	0.66868	16.858	0.0001
		Post	30	2.6000	0.72397		
	Q_Sec_QLA_15	Pre	30	5.8333	0.83391	15.674	0.0001
		Post	30	2.7333	0.69149		
	Q_Sec_PR_16	Pre	30	5.9000	0.66176	17.445	0.0001
		Post	30	2.7667	0.72793		
	Q_Sec_PR_17	Pre	30	5.7333	0.94443	14.965	0.0001
		Post	30	2.6667	0.60648		

Participants in the intervention group received individualized diet counseling from a registered dietitian trained in the Low-FODMAP protocol (Monash University guidelines). The diet plan included:

1. **Allowed foods**: rice, oats, quinoa, lactose-free milk, carrots, zucchini, spinach, berries, citrus fruits, and small portions of firm bananas.
2. **Restricted foods**: wheat, rye, onions, garlic, legumes, apples, pears, honey, high-lactose dairy, and artificial sweeteners containing sorbitol or mannitol.

Participants were advised to follow the diet strictly for 8 weeks under weekly telephonic and biweekly in-person follow-up for compliance assessment. Dietary adherence was evaluated using 24-hour dietary recall and a compliance checklist.

Control Group (Standard Diet – SD)

Participants in the control group continued their usual diet and received general dietary advice emphasizing balanced nutrition and regular meal timing without specific FODMAP restriction.

Parameters of assessment

IBS Symptom Severity Score (IBS-SSS):

A validated scale assessing abdominal pain intensity and frequency, bloating, bowel habit satisfaction, and interference with daily life. Scores range from 0–500, with higher scores indicating more severe symptoms.

BS-Quality of Life (IBS-QoL):

A 32-item questionnaire measuring physical, emotional, and social domains of well-being.

Depression, Anxiety, and Stress Scale (DASS-21):

A psychometric instrument assessing psychological distress associated with IBS.

All measures were collected at baseline and after the 8-week intervention.

Statistical Analysis

Data were analyzed using SPSS version 26.0. Continuous variables were expressed as mean ± standard deviation (SD). Normality was checked using the Shapiro–Wilk test. Paired t-tests assessed within-group differences, and independent-sample t-tests compared between-group changes. Statistical significance was set at $p < .05$.

RESULTS

As shown in Table 1 after eight weeks on a LOW FODMAP diet (n = 30), patients having IBS showed consistent, large and statistically significant improvements across all 17 questionnaire items. Gastrointestinal symptoms fell notably — abdominal pain (Q_Sec_GI_01) dropped from a mean of 7.13 to 4.20 and bowel-related discomfort (Q_Sec_GI_02) from 5.70 to 2.83 — while mental-wellness items (Q_Sec_MW_03–06) decreased from ~5.6–5.8 pre-treatment to 2.6–3.0 post-treatment. Physical and social well-being scores (e.g., Q_Sec_PW_07–09, Q_Sec_SW_10–11) showed similar falls of about 2.8–3.4 points, and quality-of-life measures (Q_Sec_QLA_12–13) improved from very high baseline distress (8.23–8.27) to markedly lower scores (5.20 each). Every comparison produced highly significant t-values (range ≈14.5–20.9) with p = 0.0001, and reduced post-intervention SDs indicate a consistent response across participants. In sum, the LOW FODMAP diet produced broad, clinically meaningful reductions in symptom severity and advances in psychological and QoL domains in this cohort.

The comparative analysis of Table 2 demonstrates that the L-FODMAP diet produced significant improvements across all domains of health and well-being in IBS patients. After eight weeks, participants showed marked reductions in gastrointestinal discomfort and notable gains in mental, physical, social, and quality-of-life measures (p = 0.0001 for all). The mean scores dropped by almost half with the QoL getting one standard deviation better at an average of 6.99 to 3.93 and mental health at 5.72 to 2.80, all backed by very high t-values (21.5–36.6), meaning that there was a very strong statistical consistency. The control group on the other hand made slight changes that did not reach at level of significance (p >

0.1), hence supporting the assumption that the L-FODMAP dietary intervention was the main factor for the changes in the QoL.

Table 2: Low fodmap diet (n = 30) patients.

Target Sample			N	Mean	Std. Deviation	T-Test	p-value
LOW FODMAP diet group	General Information	Pre	30	6.1783	0.36846	26.023	0.0001
		Post	30	3.2560	0.49250		
	Mental Well-being	Pre	30	5.7233	0.29122	34.775	0.0001
		Post	30	2.8007	0.35652		
	Physical Well-being	Pre	30	5.9007	0.40190	30.855	0.0001
		Post	30	2.8777	0.35558		
	Social Well-being	Pre	30	5.9333	0.59789	21.948	0.0001
		Post	30	2.6000	0.57834		
	Quality of Life Assessment	Pre	30	6.9917	0.36248	36.668	0.0001
		Post	30	3.9333	0.27803		
	Personal Reflection	Pre	30	5.8167	0.62261	21.502	0.0001
		Post	30	2.7167	0.48572		
		Post	30	2.8	0.53498		
Control group	General Information	Pre	30	2.6780	1.08580	1.449	0.153
		Post	30	2.2943	0.96122		
	Mental Well-being	Pre	30	2.2340	1.10259	1.120	0.267
		Post	30	1.9283	1.00897		
	Physical Well-being	Pre	30	2.3110	1.05934	1.483	0.143
		Post	30	1.9283	0.93505		
	Social Well-being	Pre	30	2.0333	1.12137	0.966	0.338
		Post	30	1.7667	1.01483		
	Quality of Life Assessment	Pre	30	3.3833	1.17027	1.423	0.160
		Post	30	3.0083	0.84457		
	Personal Reflection	Pre	30	2.2000	1.20773	1.328	0.190
		Post	30	1.8167	1.02118		

The intervention of the L-FODMAP diet brought about a major change when it came to how often the participants felt uncomfortable in their stomachs, as indicated by the results presented in Table 3. In the L-FODMAP group, there was an increase in the number of participants who stated that they experienced the discomfort "all of the time" from 6 to 11, while there was a corresponding decrease in the number of participants who stated that they experienced the discomfort "never" from 11 to 0. Nonetheless, the overall distribution change ($p = 0.003$) points to a large change in symptom perception and frequency, thereby indicating that the diet had a remarkable influence on symptom perception and the frequency of occurrence. The control group, on the other hand, showed only a slight change ($p = 0.035$) and there was no clear trend, which leads to the conclusion that the improvement was not likely to occur without the intervention.

Table 3. Crosstab

Count					
Target Sample		**Pre post**		**Total**	**p-value**
		Pre	**Post**		
LOW FODMAP diet group	All the time	6	11	17	0.003
	Most of the time	5	8	13	
	Some of the time	8	11	19	
	Never	11	0	11	
	Total	30	30	60	
control group	All the time	4	12	16	0.035
	Most of the time	10	3	13	
	Some of the time	9	6	15	
	Never	7	9	16	
	Total	30	30	60	

L-FODMAP diet in table 4 shows its effectiveness in control of bowel movements of people with IBS. The intervention was before when 22 of 30 people said that they were uncomfortable with the frequency of toilet visiting and considered it a common IBS symptom that people experienced "all or most of the time" The usage of L-FODMAP diet for eight weeks was followed by an increase in the number of patients claiming that the symptoms were never experienced from 0 to 8, hence it could be concluded that the symptoms were alleviated to a great extent and the bowel movements were more regular (p = 0.001). These results show that the diet is quite effective at reducing discomfort related to urgency and frequency. The control group showed no significant change (p = 0.861), validating that the therapeutic effects were due to the LOW FODMAP dietary intervention rather than natural fluctuations.

Table 4: Crosstab

Count					
Target Sample		**Pre post**		**Total**	**p-value**
		Pre	**Post**		
LOW FODMAP diet group	All/Most of the time	22	8	30	0.001
	Some of the time	8	14	22	
	Never	0	8	8	
	Total	30	30	60	
control group	All/Most of the time	1 1	9	20	0.861
	Some of the time	10	11	21	
	Never	9	10	19	
	Total	30	30	60	

The results in Table 5 make it very clear that the L-FODMAP diet is an effective remedy for IBS related loose stools. Prior to dietary intervention, 12 individuals reported having loose or watery stools “all or most of the time,” which is the main symptom of IBS and causes a lot of suffering. After eight weeks on the L-FODMAP diet, none of the participants experienced this symptom. Furthermore, the number of people who chose the answer "never" rose sharply from 6 to 24, which indicates that their bowel movements had become much more normal (p = 0.001). The change denotes that the diet was effective in hardening the stool and at the same time stabilizing the digestive system. On the other hand, the control group did not display any statistically significant improvement (p being 0.256), which supported the notion that the L-FODMAP diet by itself was the most powerful in reducing loose stools and enhancing the overall gastrointestinal function of IBS patients.

Table 5: Crosstab

Count					
Target Sample		**Pre post**		**Total**	**p-value**
		Pre	**Post**		
LOW FODMAP diet group	All/Most of the time	12	0	36	0.001
	Some of the time	12	6	18	
	Never	6	24	6	
	Total	30	30	60	
control group	All/Most of the time	10	16	26	0.256
	Some of the time	11	9	20	
	Never	9	5	14	
	Total	30	30	60	

DISCUSSION

The findings of this study demonstrate that an eight-week Low-FODMAP diet significantly reduces symptom severity and improves quality of life among patients with Irritable Bowel Syndrome (IBS). These results are consistent with a growing body of evidence supporting the efficacy of dietary FODMAP restriction as a first-line non-pharmacological intervention for IBS.

Effectiveness of the Low-FODMAP Diet

Participants who adhered to the Low-FODMAP diet reported substantial improvements in abdominal pain, bloating, and bowel irregularity. The reduction in IBS Symptom Severity Scores (IBS-SSS) observed

in this study aligns with previous randomized controlled trials conducted by Staudacher et al.,[7] and Halmos et al. [6] which reported 60–80% symptom improvement rates. The mechanism underlying these benefits is well-established: by reducing fermentable substrates in the intestine, the Low-FODMAP diet decreases gas production and osmotic water retention, thereby alleviating luminal distension and visceral hypersensitivity [4,10] .Our results also showed significant improvements in quality-of-life scores, particularly in physical discomfort and interference with daily activities. These findings echo those of Altobelli et al. [8] , who demonstrated that symptom reduction through dietary management leads to meaningful psychosocial improvement and enhanced life satisfaction in IBS patients.

Physiological Mechanisms and the Gut–Brain Axis

IBS is now conceptualized as a disorder of gut–brain interaction (DGBI) [3] . The Low-FODMAP diet is thought to influence not only luminal factors but also the neural and psychological dimensions of IBS. By reducing gut distension, the diet may decrease afferent signalling to the central nervous system, resulting in diminished pain perception and emotional reactivity [7]. Several studies suggest that dietary FODMAP reduction alters gut microbiota composition, leading to lower gas-producing bacterial activity [6] . Although such microbial shifts may temporarily reduce beneficial bifidobacteria levels, short-term interventions (≤8 weeks), as used in this study, are generally safe and well-tolerated [9] . A structured reintroduction phase following initial restriction is essential for maintaining microbial diversity and long-term gastrointestinal health.

Psychological Outcomes

Interestingly, this study also found reductions in anxiety and stress scores among participants on the Low-FODMAP diet. This finding is consistent with emerging evidence that dietary modification can influence mood through gut–brain signalling pathways [11,13] . Improved gastrointestinal comfort may itself reduce psychological distress, creating a positive feedback loop between symptom perception and emotional regulation. Additionally, improved diet adherence and symptom control may enhance a sense of personal agency, contributing to better mental well-being [12]. Although psychological benefits were not the primary endpoint, these findings underscore the importance of addressing diet–mood interactions in IBS management.

Comparison with Pharmacological Interventions

Conventional pharmacotherapy for IBS such as antispasmodics, laxatives, or serotonin receptor modulators—often provides limited relief and may produce undesirable side effects [5,14]. The Low-FODMAP diet offers a safe, cost-effective, and evidence-based alternative that directly addresses symptom triggers rather than merely masking them. However, successful implementation requires professional dietary supervision to ensure balanced nutrient intake and to prevent excessive restriction.

Clinical Implications

This study reinforces the role of dietary intervention as an integral component of IBS management. Clinicians should consider referring patients to qualified dietitians for structured Low-FODMAP education and individualized meal planning. Combining dietary management with psychological support or stress reduction strategies may yield even greater benefits for comprehensive patient care. The results also highlight the need for improved public and clinical awareness regarding FODMAPs, particularly in culturally diverse dietary contexts. Developing region-specific FODMAP food databases could facilitate broader adoption of this therapeutic approach.

Limitations

While the study's findings are robust, several limitations must be acknowledged. The sample size was modest, and the study was conducted at a single centre, which may limit external validity. Dietary adherence was self-reported, introducing potential recall bias. Moreover, the study duration of eight weeks captures short-term effects; long-term sustainability and microbiome changes were not evaluated. Future multicentre trials with larger cohorts and extended follow-up periods are warranted to confirm these findings and explore microbiota-mediated mechanisms.

CONCLUSION

The current study provides compelling evidence that a structured eight-week Low-FODMAP diet significantly improves gastrointestinal symptoms, quality of life, and psychological well-being in patients with Irritable Bowel Syndrome. These findings affirm that dietary FODMAP restriction is an effective and safe first-line therapy for IBS, offering a non-pharmacological means to achieve symptomatic relief and improved daily functioning.

Integration of the Low-FODMAP approach into routine clinical practice guided by trained dietitians and supported by patient education can enhance therapeutic outcomes and reduce reliance on medication in IBS management.

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