# **Irritable Bowel Syndrome and Treatment Approaches**

**Abstract**

Irritable Bowel Syndrome (IBS) is a prevalent functional gastrointestinal disorder that significantly impacts quality of life, characterized by abdominal pain, bloating, and altered bowel habits without organic pathology. This review examines the etiology, epidemiology, clinical features, and treatment approaches of IBS, with a focus on the role of the low FODMAP diet. IBS etiology involves multifactorial mechanisms, including gut microbiota dysbiosis, visceral hypersensitivity, and gut-brain axis dysregulation, with a global prevalence of 10–20%. In Turkey, prevalence ranges from 6.3% to 33.5%. Diagnosis relies on symptom-based Rome IV criteria, and IBS subtypes are classified using the Bristol Stool Form Scale. A study of obese patients (BMI ≥30 kg/m²) reported a 10.5% IBS prevalence, with smoking as a significant risk factor (p=0.003). Dietary triggers, such as high-FODMAP foods, exacerbate symptoms, while the low FODMAP diet has shown efficacy in 68–86% of patients by reducing gastrointestinal symptoms through decreased osmotic load and colonic fermentation. Clinical studies support its role in improving symptom severity, nutritional status, and quality of life, as evidenced by a significant reduction in IBS-SSS scores (p<0.05). Treatment approaches include pharmacological interventions, psychological therapies, and complementary methods, with an emphasis on integrated management. The low FODMAP diet emerges as a cornerstone nutritional strategy, highlighting the importance of personalized dietary interventions in IBS management.

## **Introduction**

Irritable bowel syndrome (IBS) is a chronic gastrointestinal disorder with a significant global burden [14]. IBS referes to the condition where people experience abdominal pain together with abnormalities in either stool frequency or consistency [15,16]. Further than pain and discomfort, it has some other symptoms such as bloating and flatulence, fecal urgency, sense of incomplete evacuation, dyspepsia, nausea, vomiting, and heartburn [17,18]. The pathophysiology of IBS is only partially understood. In 2016, Rome IV established the latest diagnostic criteria for IBS [19,20].

**Rome IV Diagnostic Criteria (Source 3)**

1. Must include two or more of the following:
2. a. Excessive straining during more than one-quarter of defecations.
3. b. Lumpy or hard stools (resembling goat feces) in more than one-quarter of defecations.
4. c. Sensation of incomplete evacuation in more than one-quarter of defecations.
5. d. Sensation of anorectal obstruction or blockage in more than one-quarter of defecations.
6. e. Manual maneuvers to facilitate defecation (e.g., digital evacuation or pelvic support) in more than one-quarter of defecations.
7. f. Fewer than three spontaneous bowel movements per week.
8. Soft, unformed stools are rarely present without laxative use.
9. Insufficient criteria for a diagnosis of IBS.

*Symptoms must have started at least six months prior to diagnosis and persisted for the last three months.*

Although the precise cause of IBS is unknown, there is increasing consensus regarding its potential etiology and pathophysiology. These include heightened pain sensitivity or visceral hypersensitivity, abnormal gut motility, small intestinal bacterial overgrowth (SIBO), low-grade intestinal inflammation, psychosocial factors, and dysregulation of the gut-brain axis. Thus, IBS is considered a multifactorial disorder, with global prevalence ranging from 10–20%, depending on diagnostic criteria (Source 4).

## **Clinical Features of IBS**

The primary symptoms of IBS include abdominal pain or discomfort, diarrhea, constipation, and bloating. The type and severity of symptoms vary between individuals but are typically consistent within the same patient. Symptoms are often intermittent, with asymptomatic periods lasting weeks. Patients most frequently report abdominal pain, followed by urgency to defecate, bloating, and altered bowel frequency. Abdominal pain in IBS is typically cramp-like, variable in intensity, localized to the lower quadrants, and does not disrupt sleep. It is not associated with loss of appetite, weight loss, or progressive deterioration (Source 5).

## **IBS Subtypes**

IBS subtypes are classified based on stool consistency, evaluated using the Bristol Stool Form Scale (Source 5).

**Here is the information from the image translated into an English table format:**

**CHART 1: Bristol Stool Form Scale**

| Tip | Description |

| 1 | Hard, nut-like pieces (difficult to pass) |

| 2 | Sausage-like, but lumpy |

| 3 | Sausage-like, but with cracks on the surface |

| 4 | Smooth and soft, like a sausage or snake |

| 5 | Small, soft lumps with even edges |

| 6 | Irregular, flaky pieces, porridge-like |

| 7 | Watery, with no solid pieces |

*Source: Van Yüzüncü Yıl University, DergiPark (Source 6).*

**Table 1: Rome and Manning Criteria for IBS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Criteria** | **Manning** | **Rome** | **Rome II** | **Rome III** | **Rome IV** |
| **Symptom Criteria** | At least 3 of the following symptoms: abdominal pain relieved by defecation, looser stools at pain onset, more frequent stools at pain onset, visible abdominal distension, passage of mucus, sensation of incomplete evacuation. | At least 3 continuous or recurrent symptoms. | At least 2 of the following symptoms for at least 12 weeks in the last 12 months: relief with defecation, change in stool frequency, change in stool form. | At least 2 of the following symptoms for at least 6 months, with onset at least 6 months prior: relief with defecation, change in stool frequency, change in stool form. | At least 2 of the following symptoms for at least 1 day per week in the last 3 months: abdominal pain related to defecation, change in stool frequency, change in stool form. |
| **Abdominal Discomfort/Pain** | Included as a key symptom (relieved by defecation). | Not specifically defined. | Not specifically defined. | Abdominal discomfort or pain. | Abdominal pain at least 1 day per week for the last 3 months. |
| **Stool Changes** | Looser stools, more frequent stools, presence of mucus. | Not specifically defined. | Change in stool frequency, stool form, presence of mucus. | Change in stool frequency, stool form, presence of mucus. | Change in stool frequency, stool form, presence of mucus. |
| **Sensation of Incomplete Evacuation** | Included as a symptom. | Not specifically defined. | Yes. | Yes. | Yes. |
| **Straining During Defecation** | Not specifically listed. | Not specifically defined. | Yes. | Yes. | Not specifically required. |
| **Urgency** | Not specifically listed. | Not specifically defined. | Yes. | Yes. | Not specifically required. |
| **Onset Criteria** | No specific onset duration. | Not specifically defined. | Symptoms started at least 12 months prior to diagnosis. | Symptoms started at least 6 months prior to diagnosis. | Symptoms started at least 3 months prior to diagnosis. |
| **Frequency Criteria** | No specific frequency requirement. | Not specifically defined. | Symptoms present on at least 25% of days. | Symptoms present on at least 25% of days. | Not specifically quantified (at least 1 day/week). |

*Source: Elif, E. D. E., & İlktac, H. Y. (2018). Current dietary approaches in irritable bowel syndrome. İstanbul Sabahattin Zaim Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 1(1), 1-6 (Source 5).*

## **Epidemiology and Impact**

Irritable Bowel Syndrome is a prevalent functional gastrointestinal disorder that significantly impairs quality of life, leads to workforce productivity losses, and incurs substantial healthcare costs. It ranks among the top ten reasons for primary care visits, accounting for 12% of diagnoses in primary care settings. Among patients referred to gastroenterologists, IBS constitutes 20% of consultations and 28–36% of diagnoses. IBS is more common in women and middle-aged individuals but affects all age groups and both sexes. Epidemiological studies in Turkey (Izmir, Sivas, Elazığ, and Diyarbakır) report IBS prevalence ranging from 6.3% to 19.1% (Source 1).

## **Etiology of IBS**

The gut microbiota is hypothesized to play a role in IBS etiology. Alterations in gut flora may contribute to low-grade inflammatory responses. Clinical and epidemiological studies have identified small intestinal bacterial overgrowth (SIBO) in IBS patients. Gastrointestinal infections or antibiotics can disrupt gut microbiota composition, and such changes have been associated with IBS symptoms. Increased gut microbial abundance is proposed as evidence of the microbiota’s role in IBS. The diversity of bacteria and clinical symptoms in IBS is extensive, and no definitive molecular or organic biomarkers exist for diagnosis. Dietary habits (e.g., consumption of yogurt or fermented foods) and medical practices vary by region and country, influencing gut microbiota composition. The complexity, variability, and instability of the human gut microbiota limit current understanding. Changes in microbiota composition may precipitate IBS, and understanding its role is a critical prerequisite for elucidating IBS pathogenesis. The gut microbiota is primarily colonized within the first 18 months of life. While the characteristics of non-pathogenic bacteria remain unclear, microbial stability and diversity are key factors influencing gut-specific disorders. Earlier studies using classical culture methods reported reduced levels of coliforms, lactobacilli, and bifidobacteria in IBS patients compared to healthy controls (Source 7).

Epidemiological studies suggest an association between obesity and chronic gastrointestinal complaints, such as dyspepsia and IBS, indicating potential shared pathophysiological mechanisms (Source 1). Obesity, characterized by excessive energy intake relative to expenditure and an increased fat-to-lean body mass ratio, is a chronic condition affecting multiple organ systems, leading to significant health issues, including cardiovascular and endocrine disorders (Source 6). Body Mass Index (BMI) is a practical method for assessing weight status (Source 8).

**Table 2: BMI Classifications for Adults (≥19 years) (WHO, 1995)**

|  |  |
| --- | --- |
| **BMI (kg/m²)** | **Classification** |
| <16.0 | Severe thinness |
| ≥16.0–<17.0 | Moderate thinness |
| ≥17.0–<18.5 | Mild thinness |
| ≥18.5–<24.9 | Normal |
| ≥25.0–<29.9 | Overweight |
| ≥30.0–<39.9 | Obese |
| ≥40.0 | Severely obese |

*~~Source: Karabayraktar, T., Ahıshalı, E., & Dolapçıoğlu, C. (2014). Obesity and Irritable Bowel Syndrome. J Kartal TR, 25(2), 127-32.~~*

~~Individuals with a BMI ≥30 kg/m² are classified as obese (Source 1).~~ A study investigating IBS prevalence and associated risk factors in obese patients included 124 patients (BMI ≥30 kg/m²) meeting inclusion criteria from an initial cohort of 215. IBS was diagnosed using Rome III criteria, excluding organic pathologies (Source 1).

**Inclusion Criteria**:

* Patients ≥18 years with obesity.
* Absence of exclusion criteria.
* Consent to participate.

**Exclusion Criteria**:

* Presence of alarm symptoms.
* Systemic diseases affecting bowel motility (e.g., diabetes, chronic kidney disease, systemic lupus erythematosus, multiple sclerosis, thyroid dysfunction).
* Use of medications affecting bowel motility (e.g., calcium channel blockers, beta-blockers, antidepressants).
* Unwillingness to participate.

Demographic and clinical data were collected, and Rome III criteria were used to assess IBS presence. Of the patients, 79.8% were female, with a mean age of 39.1 ± 10.5 years. Comorbid conditions (e.g., gastroesophageal reflux, chronic hepatitis B, hypertension) were present in 25% of patients, and 21.8% were smokers. Only 9.7% had prior knowledge of IBS. IBS was diagnosed in 10.5% of patients, with 85.7% reporting abdominal pain/discomfort and altered bowel habits. IBS prevalence was significantly higher in smokers (25.9%) compared to non-smokers (p=0.003). Although IBS was detected in 12.1% of women and 4% of men, no significant sex-based difference was found (p>0.005), possibly due to the low number of male participants. IBS prevalence was 12.5% among primary school graduates and 12.9% among high school graduates but absent in university graduates. No significant association was found between IBS and education level, age, sex, BMI, or comorbidities (Source 1).

The study reported an IBS prevalence of 10.5% in obese patients, similar to general population rates. Obesity was not a risk factor for IBS, but smoking significantly increased IBS prevalence in obese individuals. Given the rising prevalence of obesity, clarifying its relationship with gastrointestinal disorders remains critical (Source 1).

## **Dietary Triggers and IBS**

Approximately two-thirds of IBS patients perceive their gastrointestinal symptoms as food-related. Poorly absorbed carbohydrates (e.g., lactose in dairy, beans, onions, cabbage, apples, wheat), fatty foods, coffee, alcohol, and spicy foods have been identified as triggers or exacerbators of gastrointestinal symptoms. Studies investigating food intolerance in IBS have employed strict exclusion or elimination diets followed by food reintroduction. For example, in a study of 25 consecutive IBS-D patients, a one-week diet restricted to a single meat product, a single fruit, and distilled or spring water resulted in 67% (14/21) achieving symptom resolution. Six of these 14 underwent randomized, double-blind food challenges via nasogastric tube with a suspected trigger food or control, confirming food intolerance. Lactose malabsorption due to lactase deficiency is known to cause abdominal pain, bloating, and loose stools. Primary lactase deficiency, resulting from the loss of lactase activity between ages 2–6, affects approximately 70% of the global population, while secondary deficiency often follows gastrointestinal conditions like viral gastroenteritis or celiac disease (Source 9).

Probiotics, dietary supplements containing single or mixed live microbes, have been extensively studied in IBS and other conditions. A systematic review and meta-analysis of 14 randomized controlled trials found modest symptom improvement with several weeks of probiotic use in IBS patients (odds ratio, 1.6; 95% CI, 1.2–2.2) (Source 9).

## **Dietary Interventions for IBS**

Effective dietary management of IBS should incorporate evidence-based guidelines and lifestyle recommendations provided by healthcare professionals with expertise in IBS dietary management. Studies have developed various dietary strategies to design effective plans. General recommendations include regular meal consumption, adequate hydration, and limiting potential triggers such as alcohol, caffeine, carbonated beverages, and spicy foods. Encouraging increased physical activity in sedentary individuals is also advised. Good nutritional habits, such as taking time for meals, avoiding meal skipping, eating while seated, thorough chewing, and avoiding late-night meals, support IBS management (Source 10).

### **Low FODMAP Diet**

FODMAPs (Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols) are poorly absorbed short-chain carbohydrates that undergo fermentation in the small or large intestine. These include fructose, lactose (in individuals with impaired enzyme activity or transport mechanisms), fructans, galacto-oligosaccharides, and polyols (sugar alcohols). Table 3 lists examples of high-FODMAP foods and suitable low-FODMAP alternatives (Source 11).

Patients across all IBS subtypes report greater satisfaction with stool consistency when following a low FODMAP diet. Eliminating FODMAPs from the diet results in significant improvement in gastrointestinal and extra-intestinal symptoms in 68–86% of individuals (Source 10).

#### **Mechanisms of the Low FODMAP Diet in IBS**

Not all FODMAPs exacerbate abdominal symptoms in IBS patients, with symptom presence and severity depending on the degree of malabsorption. Two primary mechanisms are responsible for FODMAP-induced symptoms in IBS. First, FODMAPs are poorly absorbed in the small intestine and osmotically active, leading to net fluid secretion into the small intestine, which can distend the intestine and contribute to abdominal symptoms. A study in ileostomy patients reported a 22% increase in intestinal output with high FODMAP intake due to increased osmotic load. Additionally, a recent magnetic resonance imaging study demonstrated abnormal fluid accumulation in the small intestine of IBS patients after lactulose (an unabsorbed carbohydrate) intake, causing significantly more symptoms compared to healthy controls, supporting the mechanism underlying diarrhea in some IBS patients. Second, FODMAPs are rapidly fermented by colonic microbiota, leading to gas production and colonic distension, which are associated with pain and bloating. A recent study showed reduced breath hydrogen production (indicating lower microbiota gas production) in both healthy and IBS subjects on a low FODMAP diet, correlating with improved gastrointestinal symptoms in IBS patients. These findings support the hypothesis that rapid fermentation of undigested FODMAPs in the colon causes distension, bloating, and pain due to excessive gas production (Source 11).

#### **Clinical Studies on the Low FODMAP Diet in IBS**

Research on dietary FODMAP restriction in IBS consistently supports the efficacy of the low FODMAP diet in improving overall gastrointestinal symptoms in adult IBS patients. However, designing and implementing prospective placebo-controlled dietary intervention studies is challenging. Many studies are retrospective, prospective, or uncontrolled, making them susceptible to bias and confounding. To date, two controlled studies and six randomized controlled trials have evaluated the low FODMAP diet in IBS (Source 11).

**Table 3: Examples of High-FODMAP Foods and Low-FODMAP Alternatives** (Source 11)

|  |  |  |
| --- | --- | --- |
| **Sugar Type** | **High-FODMAP Foods** | **Low-FODMAP Alternatives** |
| **Oligosaccharides** | **FOS**: Wheat, rye, barley-based products; vegetables (onion, garlic, artichoke, leek, beetroot, savoy cabbage); fruits (watermelon, peach, persimmon, prunes, nectarine, most dried fruits). **GOS**: Legumes (kidney beans, baked beans, soybeans); vegetables (beetroot, peas). | Fruits: Banana, most berries (except blueberries), blackberries, grapes, lemon, lime, mandarin, orange, kiwi, pineapple, passionfruit, rhubarb. Vegetables: Red bell pepper, bok choy, green beans, parsnip, beetroot, cucumber, carrot, celery, eggplant, lettuce, potato, Jerusalem artichoke, tomato, zucchini. Grains: Gluten-free bread/cereals, quinoa. |
| **Disaccharides** | **Lactose**: Dairy (cow/goat milk, yogurt). | Dairy: Lactose-free milk, almond/rice-based milk, yogurt, ice cream, hard cheese, feta, cottage cheese. |
| **Monosaccharides** | **Fructose (excess over glucose)**: Fruits (apple, pear, watermelon, mango, cherry, blueberries, fruit juices from high-fructose foods); honey; sweeteners (high-fructose corn syrup); vegetables (asparagus, peas). | Fruits: Banana, grapes, honeydew melon, kiwi, lemon, lime, mandarin, orange, passionfruit, most berries (except blueberries, blackberries). Sweeteners: Maple syrup, golden syrup. |
| **Polyols** | **Sorbitol**: Fruits (apple, pear, avocado, apricot, blackberry, nectarine, peach, plum, prunes, watermelon). **Mannitol**: Vegetables (sweet potato, mushroom, cauliflower, snow peas). | Sweeteners: Maple syrup, sugar (sucrose). Fruits: Banana, grapes, honeydew melon, kiwi, lemon, mandarin, orange, passionfruit. |

*Source: Nanayakkara, W. S., et al. (2016). Efficacy of the low FODMAP diet for treating irritable bowel syndrome: the evidence to date. Clinical and Experimental Gastroenterology, 131-142.*

### **Evaluation of the Low FODMAP Diet’s Effects on IBS Symptoms, Nutritional Status, and Quality of Life**

A study conducted at the 25 Aralık State Hospital (Internal Medicine and General Surgery Clinics) and Gaziantep University Faculty of Medicine (Gastroenterology Department) evaluated the effects of the low FODMAP diet on IBS symptoms, nutritional status, and quality of life in women aged 20–49 diagnosed with IBS per Rome IV criteria. Patients under cardiology, neurology, or psychiatry follow-up, those with gastrointestinal diseases other than IBS, diabetes, oncology patients, pancreatitis, pregnant, or breastfeeding women were excluded. Initially, 38 adults were enrolled, but 12 were excluded due to non-compliance or unwillingness to continue, leaving 26 participants. Three-day food consumption records (two weekdays, one weekend day) were collected weekly from baseline to study completion. Energy requirements were calculated using the Mifflin St. Jeor equation, adjusted for activity levels, and personalized dietary plans were developed. Participants were educated on the low FODMAP diet by a dietitian, eliminating foods high in fructans and galacto-oligosaccharides (rye, wheat, barley, onions, legumes), lactose-containing products (milk, yogurt, cheese), excess fructose (apples, watermelon, pears, asparagus, honey), and polyols (apricots, peaches, artificially sweetened products). Food consumption records were analyzed using the Nutrition Information System (BeBiS version 8.1, Pacific Group, Germany) to calculate energy, macro- and micronutrients, and FODMAP intake (fructose, lactose, sorbitol, mannitol). Oligosaccharide varieties and free fructose could not be calculated and were excluded. IBS severity was assessed using the IBS Severity Scoring System (IBS-SSS), comprising five questions scored from 0–100, evaluating abdominal pain severity, frequency, bloating, bowel habit satisfaction, and quality of life impact (maximum 500 points; 75–174: mild IBS; 175–299: moderate IBS; >300: severe IBS) (Source 2).

Participants’ socio-demographic characteristics included a mean age of 33.1 ± 8.8 years, 73.1% married, 42.1% with three children, 53.8% primary school graduates, 61.5% housewives, and 52.0% with income equal to expenses. Non-smokers comprised 88.5%. Daily energy intake decreased significantly from 1388.8 ± 606.09 kcal/day at baseline to 1111.8 ± 267.20 kcal/day post-intervention (p<0.05). Daily fat intake reduced from 68.4 ± 28.62 g to 49.8 ± 13.46 g (p<0.05). No significant changes were observed in dietary fiber, soluble fiber, or insoluble fiber intake (p>0.05). Lactose, oligosaccharide, and mannitol intake significantly decreased (p<0.05). Mean daily FODMAP intake dropped from 13.7 ± 7.98 g/day to 6.7 ± 2.56 g/day (p<0.05). Among minerals, iron intake increased significantly, as did thiamine and niacin among vitamins (p<0.05). Quality of life scores improved from a median of 49.26 to 75.74 (p<0.05), with significant increases in subscale scores (p<0.05). Anxiety and depression scores decreased significantly (p<0.05). The median IBS-SSS score decreased from 341 [182–475] to 120 [0–375]. Compared to healthy controls, the low FODMAP group exhibited significantly lower gastrointestinal symptom scores (abdominal pain, bloating, stool consistency dissatisfaction) (Source 2).

## **Treatment Approaches**

IBS treatment can be categorized into general approaches, medical therapy, and complementary therapies. No gold-standard treatment exists, and physicians must communicate this clearly, avoiding judgmental attitudes. The physician-patient relationship is particularly critical in IBS, requiring consistent behavior. For example, reassuring patients that IBS is benign while ordering extensive tests can create confusion. Exploring why a patient with chronic abdominal pain seeks care now, using empathetic language, can uncover social or dietary triggers. Pharmacological treatment should target specific symptoms, such as laxatives for constipation or antidiarrheals for diarrhea. Antidepressants and antispasmodics may be used based on patient response and tolerance (Source 12).

**Table 4: Medications Used in IBS Treatment**

Here’s the information organized in a table format in English:

|  |  |  |
| --- | --- | --- |
| **Category** | **Substances/Drugs** | **English Translation/Description** |
| **Laxatives** | Osmotic laxatives | Osmotic laxatives include sugar alcohols (e.g., lactulose) and magnesium salts, acting by drawing water into the intestines to soften stool. |
|  | Gata milk-derived artichokes | Gata milk-derived artichokes contain fiber that supports bowel movements and aids in constipation relief. |
|  | Chlorine-containing laxatives (lubiprostone) | Chlorine-containing laxatives like lubiprostone activate chloride channels, increasing intestinal fluid secretion to ease bowel movements. |
| **Anti-Diarrheal Drugs** | Loperamide | Loperamide slows intestinal motility, reducing diarrhea by prolonging transit time. |
|  | Codeine | Codeine decreases gut motility and secretion, effectively managing acute diarrhea. |
|  | Bismuth | Bismuth has antisecretory and antimicrobial effects, aiding in diarrhea control. |
|  | Kaolin | Kaolin absorbs toxins and water in the gut, helping to solidify stools. |
|  | Colextran | Colextran binds to toxins, reducing diarrhea severity. |
| **Serotonin Receptor-3 Antagonists** | Alosetron, cilansetron, ondansetron, granisetron | Alosetron, cilansetron, ondansetron, and granisetron are serotonin-3 receptor antagonists that reduce visceral hypersensitivity and intestinal motility, primarily for IBS-D. |
| **Antispasmodic/Anticholinergic Drugs** | Hyoscine N-butyl bromide, belladonna, otilonium bromide, propantheline, dicyclomine, mebeverine, pinaverium, peppermint oil | Antispasmodics like hyoscine N-butyl bromide and otilonium bromide relax smooth muscles, alleviating abdominal cramps; peppermint oil offers additional relief. |
| **Serotonin Receptor-4 Antagonists** | Tegaserod | Tegaserod, a serotonin-4 receptor agonist, enhances intestinal motility but is restricted due to SVO risk in certain patients. |
| **Antidepressant Drugs** | TCADs | Tricyclic antidepressants (TCADs) modulate pain perception and gut motility, beneficial in IBS management. |
|  | SSRIs | Selective serotonin reuptake inhibitors (SSRIs) improve mood and may reduce IBS symptom severity. |
| **Antiflatulents** | Alverin + simethicone | Alverin with simethicone reduces gas and bloating by breaking down gas bubbles in the gut. |
| **Antibiotics** | Rifaximin | Rifaximin targets gut bacteria, alleviating symptoms in IBS patients with bacterial overgrowth. |
| **Probiotics** | Bifidobacterium infant | Bifidobacterium infant restores gut flora balance, improving IBS symptoms. |
| **Motility Modifiers** | Trimebutin maleate | Trimebutin maleate regulates intestinal motility, aiding in IBS symptom relief. |
| **Other Drugs** | Hormone receptor agents | Hormone receptor agents may influence gut function, though evidence is limited. |
|  | Guaiac resin C | Guaiac resin C has anti-inflammatory properties, potentially easing IBS discomfort. |
|  | Serotonin receptor agents | Serotonin receptor agents modulate gut-brain axis, impacting IBS symptoms. |
|  | GLP analog | GLP analogs may regulate gut motility and appetite, with emerging roles in IBS management. |

*Source: Ünal, H. Ü., & Doğan, İ. (2012). Irritable Bowel Syndrome. Güncel Gastroenteroloji, 16(3), 213-217.*

Placebo response rates in IBS range from 30–40%. A randomized trial comparing placebo to no treatment found symptom relief in 59% of placebo recipients versus 35% of untreated patients. Advanced evaluations alone can reduce symptoms, with uncontrolled studies suggesting improved daily function in tested patients. Colonoscopy to rule out organic causes may provide short-term symptom relief, but diagnostic tests should be used judiciously (Source 13).

Due to the brain-gut axis and abnormal central nervous system pain sensitization, antidepressants and psychological therapies are effective. A meta-analysis of 11 randomized controlled trials (744 patients) found tricyclic antidepressants more effective than placebo, slowing intestinal transit via anticholinergic effects and reducing abdominal pain. Cognitive-behavioral therapy and hypnotherapy have demonstrated benefits, with hypnotherapy showing efficacy comparable to the low FODMAP diet. However, combining hypnotherapy and diet did not surpass hypnotherapy alone. Access to psychological therapies is limited, and evidence on early intervention benefits is insufficient (Source 13).

## **Complementary Therapies**

Many IBS patients, dissatisfied with conventional treatments, turn to alternative therapies. Evidence on herbal treatments is limited. Studies on St. John’s Wort and STW-5 (a herbal extract) found STW-5 beneficial compared to placebo, but St. John’s Wort showed no benefit. Melatonin has been reported to reduce abdominal pain in IBS patients (Source 13).

## **Conclusion**

Irritable Bowel Syndrome significantly impairs quality of life and requires comprehensive management. Treatment encompasses medical, pharmacological, and nutritional approaches, with the low FODMAP diet emerging as a cornerstone nutritional therapy, supported by robust evidence. The diet improves quality of life and reduces symptom frequency and severity. Optimal outcomes are achieved through integrated medical, pharmacological, and nutritional interventions, forming an inseparable whole.

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

## **References**

1. Karabayraktar, T., Ahıshalı, E., & Dolapçıoğlu, C. (2014). Obesity and Irritable Bowel Syndrome. *J Kartal TR*, 25(2), 127–132.
2. Ustaoğlu, T., Tek, N. A., & Yıldırım, A. E. (2020). Evaluation of the effects of the FODMAP diet on IBS symptoms, nutritional status, and quality of life in irritable bowel syndrome. *Beslenme ve Diyet Dergisi*, 48(1), 43–54.
3. Kaya, M., & Kaçmaz, H. (2016). Re-evaluation of functional bowel disorders according to Rome IV criteria. *Güncel Gastroenteroloji*, 20(4), 393–407.
4. Nanayakkara, W. S., Skidmore, P. M., O’Brien, L., Wilkinson, T. J., & Gearry, R. B. (2016). Efficacy of the low FODMAP diet for treating irritable bowel syndrome: The evidence to date. *Clinical and Experimental Gastroenterology*, 131–142.
5. Elif, E. D. E., & İlktac, H. Y. (2018). Current dietary approaches in irritable bowel syndrome. *İstanbul Sabahattin Zaim Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, 1(1), 1–6.
6. Van Yüzüncü Yıl University, DergiPark.
7. Karacaer, C., Varım, C., Bilal, T. O. K. A., Yaylacı, S., & Genç, A. B. (2017). Gut microbiota, probiotics, and irritable bowel syndrome (IBS). *Journal of Human Rhythm*, 3(3), 120–125.
8. Altunkaynak, B. Z., & Özbek, E. (2006). Obesity: Causes and treatment options. *Van Tıp Dergisi*, 13(4), 138–142.
9. Pekcan, G. (2008). Assessment of nutritional status. *Diyet El Kitabı*, 726, 67–141.
10. Özyürek, F. Dietary treatment and nutritional supplements as a treatment approach in irritable bowel syndrome.
11. Nanayakkara, W. S., Skidmore, P. M., O’Brien, L., Wilkinson, T. J., & Gearry, R. B. (2016). Efficacy of the low FODMAP diet for treating irritable bowel syndrome: The evidence to date. *Clinical and Experimental Gastroenterology*, 131–142.
12. Ünal, H. Ü., & Doğan, İ. (2012). Irritable bowel syndrome. *Güncel Gastroenteroloji*, 16(3), 213–217.
13. Engürülü, S. F., & Kasap, E. (2020). Irritable Bowel Syndrome. *Güncel Gastroenteroloji*, 24(1), 41–47.
14. Chuy, D. S., Wi, R. S., & Tadros, M. (2024). Irritable Bowel Syndrome: Current Landscape of Diagnostic Guidelines and Therapeutic Strategies. *Gastroenterology Insights*, *15*(3), 786-809.
15. Black, C. J., & Ford, A. C. (2025). An evidence-based update on the diagnosis and management of irritable bowel syndrome. *Expert Review of Gastroenterology & Hepatology*, 1-16.
16. Ford, A. C., Sperber, A. D., Corsetti, M., & Camilleri, M. (2020). Irritable bowel syndrome. *The Lancet*, 396(10263), 1675–1688.
17. Amery, M., & Yazdani Ashtiani, S. (2019). Effect of Multispecies Probiotic Supplementation on Irritable Bowel Syndrome. *Journal of Pharmaceutical Research International*, *28*(6), 1–9. <https://doi.org/10.9734/jpri/2019/v28i630221>
18. Govindaraja, C., Chandramouli, A., Winn, T., Min, A. K. K., Jaiprakash, H., Patil, A., Kale, S., & Sornam, S. V. (2018). Prevalence of Irritable Bowel Syndrome and Its Imprint on the Quality of Life of Undergraduate Students at a Malaysian Medical University. *Journal of Advances in Medicine and Medical Research*, *26*(5), 1–13. <https://doi.org/10.9734/JAMMR/2018/41013>
19. Bhinder, G., Meza-Cardona, J. M., Low, A., Aumais, G., Attara, G. P., & Gray, J. R. (2023). Irritable bowel syndrome patient experience: a survey of patient-reported symptoms by irritable bowel syndrome subtype and impact on quality of life. *Journal of the Canadian Association of Gastroenterology*, *6*(6), 219-228.
20. Resen, F. M., Jasem , R., Ahmad , A. A., Nasir , F., Wazirzai , B., Hamdi , S., & Shoaib , M. (2024). Prevalence of Irritable Bowel Syndrome and Associated Factors among Patients with Migraine Attending Dubai Health Authority Clinics: A Cross Sectional Study, Dubai, 2023. *Asian Journal of Advanced Research and Reports*, *18*(4), 48–56. https://doi.org/10.9734/ajarr/2024/v18i4622