



## Effect of Diets (Low FODMAP) on Reducing Symptoms in Patients with Irritable Bowel Syndrome among Students of Lebanese University-Yemen

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**Received date:** 03 January, 2022; Manuscript No. JFND-22-51879;

**Editor assigned date:** 07 January, 2022; Pre QC No. JFND-22-51879 (PQ);

**Reviewed date:** 13 January, 2022; QC No. JFND-22-51879;

**Revised date:** 24 January, 2022; Manuscript No: JFND-22-51879(R);

**Published date:** 04 February, 2022; DOI:10.4172/2324-9323.1000311.

### Abstract

Dietary restriction of fermentable carbohydrates (a low FODMAP diet) has been reported to reduce symptoms in some patients with Irritable Bowel Syndrome (IBS). We performed a randomized, placebo-controlled study to determine its effects on symptoms in patients with IBS. Irritable bowel syndrome prevalence is high, affecting about 10% to 15% of the general population in developed countries, being more prevalent in women than in men in the proportion 2:1. One hundred surveys were collected. Nearly 70% of participants reported that patients commonly associate food with GI symptoms. Therefore, 70 patients were randomized to low FODMAP diet (n=59) and placebo (n=11). The intervention groups had significantly greater reductions in IBS Symptom Severity score at 2 weeks. Both groups (IBS-C and IBS-D) had marked mean improvements in Symptom Severity. Of the 30 IBS participants, 10 had IBS-D, 13 had IBS-C, 5 had IBS-M, and 2 had IBS-U. Participants were with a median age of 23 years, body mass index of 22.6. Symptoms of pain Severity, Satisfaction with bowels, Abdominal pain and Bloating, were decreased from 4, 3, 4, 4, score to 2 and 3; 2 and 2; 2 and 2; 2 and 2 for IBS-C and IBS-D respectively. While symptoms of affecting life, heart burn, nausea, belching, flatulence, constipation, diarrhea, urgency, incomplete evacuation and tiredness were decreased from 3 to 2 for IBS-D; 3 to 2 for IBS-D; 3 to 1 for IBS-D; 3 to 2 for IBS-C; 3 to 1 for IBS-D and 4 to 2 for IBS-C; 3 to 2 for IBS-C; 3 to 1 for IBS-D; 4 to 2 for IBS-D and 3 to 1 for IBS-C; 3 to 2 for IBS-D and 2 to 1 for IBS-C score respectively.

**Keywords:** Diet; IBS; Food

### Introduction

Irritable Bowel Syndrome (IBS) is a common digestive functional disorder, which is characterized by symptoms such as abdominal pain, bloating, and changes in intestinal function without any damage to the tissue. The role of diet in triggering IBS symptoms has long been recognized [1]. One billion people or 15% of the world's population are affected by this disease [2]. IBS also affects an average of 11% of the adult population in developing countries [3-5]. IBS is the disorder most commonly encountered by gastroenterologists, and diagnosis is

made according to a symptom-based classification system, the Rome Criteria, with the latest version, Rome IV, recently released. Prevalence rates in North America have been reported as approximately 12%, and symptoms occur more often in patients less than 50 years of age. Patients with IBS suffer not only from gastrointestinal distress, but approximately 40%–60% experience comorbid psychological disorders, such as depression or anxiety. In addition, patients with IBS report higher levels of somatization compared to patients without IBS but with gastrointestinal symptoms. Not surprisingly, IBS has been shown to negatively impact patients' quality of life, as well as to adversely affect society's financial resources. In addition, IBS affects 10% to 15% of adults in the United States and results in significant disorders in Health-Related Quality Of Life (HRQOL), daily work and labor productivity as well as indirect costs [6].

Despite the substantial cost of IBS to patients and society, curative, medical interventions have yet to be discovered. The development and persistence of IBS symptoms have been acknowledged as multifactorial in nature, making treatment of the disorder a complicated, clinical endeavor. Approaches are based on the reduction of patient symptomatology, and current pharmacological management often provides suboptimal relief. Current treatments including pharmacological interventions, diet therapy, and behavioral treatments. The following drug categories are used to treat IBS: anti-depressants, mint oil, non-absorbable antibiotics from the intestines and the drugs which stimulate GABA secretion [7]. Antidepressants normally prevent reabsorption of certain neurotransmitters such as norepinephrine and serotonin and dopamine in nerve terminals which despite promising results, there are significant side effects such as anxiety and mental disorders as well as gastrointestinal, genital organs, eating disorders and pain [8]. The most reliable evidences support drugs such as rifaximin, lubiprostone, fiber supplement and mint oil for treatment of IBS. New drugs for [9].

### Method and Materials

#### Study design and participants

We performed a 3 trial of 70 patients with IBS (18–65 years old), based on the Rome III criteria [10], were recruited between September 2020 and October 2020 via advertisements in nutrition clinic at LIU, and through word of mouth. Patients were randomly assigned (blinded) to groups given counseling to follow a diet low in FODMAPs for 3 weeks, resulting in 3 groups (27 receiving low in FODMAPs diet (IBS-D), 26 receiving low in FODMAPs diet (IBS-C), 24 receiving placebo diet. Dietary counseling was given to patients in all groups and data on foods eaten and compliance were collected.

#### Study protocol

Participants recorded their baseline symptoms daily. Participants then were randomized to receive 14 days of a diet low in FODMAPs or 14 days of a diet containing FODMAP content of a typical Yemeni diet. Participants were blinded to the diets and almost all food was provided. The symptoms determined by direct questioning by a study investigator.

## Interventional Diets

Almost all food, comprising 3 main meals and 2 snacks daily, was provided. Detailed meal plans specifying meals and quantities were supplied (Supplementary Table 1). However, participants were instructed to eat to their appetite. The supplemented foods contained at least one FODMAP for those following the typical Yemeni diet. The meal plans were aimed to provide an average of calorie/day and to meet the recommended servings of all food groups according to the dietary guidelines [24].

## Procedures

Dietary compliance to both placebo diet and low FODMAP diet was self-reported weekly during telephone calls (“In the last week I have followed the diet.”). Patients were considered compliant if they reported following the diet frequently or always (i.e., >50% of the time) on at least 2 of the 3 weekly assessments.

## Results and Discussion

### Participants

Patients were recruited between January 28, 2013 and November 21, 2014. A total of 162 patients were screened. Therefore, 104 patients were randomized to low FODMAP diet (n=51) and placebo (n=51). Baseline characteristics of patients for both diets as (Table 1). All patients reported following the diet >50% of the time on at least 2 of the 3 weeks and were defined as compliant to the dietary interventions.

Forty-five participants were recruited for the study. Seven participants (3 IBS and 4 healthy controls) quit the study before commencing their second diet and were excluded from analysis. 7 participants were female, with a median age of 28 years, body mass index of 23.6. Of the remaining 38 participants, 30 had IBS and 8 were healthy controls. The IBS and healthy cohorts were well matched for sex, age, and body mass index, and 26 participants had breath hydrogen testing for fructose malabsorption.

In this study, it appears from that, the quality of life in the IBS-C and placebo groups (traditional Yemeni food) was a score 2, while the score was 3 for the IBS-D group, meaning that the group suffered from the quality of life more than the previous two groups, at week zero, i.e. (the beginning of the study). The quality of life in group IBS-D improved steadily at first and second week, while the improvement in IBS-C and placebo groups remained stable at score 2 respectively. This indicates that low Food map diet did not affect the IBS-C and Placebo groups from the beginning of the study to the end.

## Conclusion and Recommendations

In conclusion, the results of this study provide high quality evidence that the low FODMAP diet is efficacious for treatment of functional gastrointestinal symptoms in unselected IBS with

symptoms being halved compared with a typical Yemeni diet. Self-assessed satisfaction with stool consistency also was improved in both IBS-D and IBS-C subgroups. These results support the notion that the low FODMAP diet has efficacy in the vast majority of patients with IBS and support its use as a first-line therapy. The low-FODMAP diet also resulted in a lower fermentation level in the colon.

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