

# IBS Symptom Management and Depressive Symptoms in the U.S. Adults

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Irritable Bowel Syndrome (IBS) is a condition that is characterized by broad symptoms consisting of abdominal pain, bloating, irregular bowel movements, and other intestinal issues. IBS is currently estimated to affect 1015% of individuals around the world, with the majority of sufferers being women.[1] This condition is chronic in nature and is typically managed through conservative or therapeutic methods. As with many chronic diseases, individuals rarely seek medical care for IBS, which is not surprising given the personal nature of symptom presentation. Although up to 80% of diagnosed IBS patients attain a degree of symptom relief through conventional medication strategies, many are left without symptom resolution and a decreased quality of life (QOL).[2] The co-occurrence of decreased mental and physical QOL can be devastating, with 40-60% of IBS patients having at least one co-existing mood disorder, including anxiety and depression. Similarly, it has been observed that the severity of IBS is directly associated with the severity of various mood disorders.[3] Often, the patients who suffer the most mentally and physically are unable to benefit from traditional treatment.

Non-pharmacological alternatives such as cognitive behavioral therapy, dietary modifications, lifestyle changes, probiotics, and other dietary supplements show promise.[4] These treatments target the underlying mechanisms responsible for IBS, most notably inflammatory pathways that trigger dysfunction in the gut-brain axis.[5] With increased interest in integrative and alternative approaches to symptom management, and the growing knowledge base regarding manipulation of the gut-brain axis, we developed and distributed a nation-wide survey to determine the incidence and efficacy of symptom management approaches and their association with depression severity, measured by the

nine-item Patient Health Questionnaire (PHQ-9). [6]

Survey questions were developed using previously validated instruments and a combination of question batteries utilized in previous IBS studies [7-9] that were modified to include additional therapeutic approaches[10] as well as their efficacy as measured by a 7-point Likert scale. Notably, we framed these questions in the context of the previous three months in order to report the most recent period of symptom management approaches.

Respondents were either formally diagnosed with IBS or met Rome IV criteria for IBS[11] per the screening questions. The survey was distributed by Qualtrics Panels from July 24 to August 9, 2023. Between sex differences were obtained with chi-squared and independent sample t-tests. Backward stepwise linear regression determined the predictive value of independent variables on PHQ-9 scores.

Of 2,063 attempted responses, 1,663 were excluded for having comorbid gastrointestinal diagnoses, non-current symptoms, or failed attention check questions. Of the 400 valid responses analyzed, 63% were medically diagnosed with IBS, 86% were female, 93% were non-Hispanic, with an average age of 34±9 years and a body mass index (BMI) of 29.2±7.9 kg/m<sup>2</sup> (Table 1). The average PHQ-9 score was 11.6±6.1 (range 0-27). The most frequently avoided dietary items (>15% of respondents) were dairy, artificial sweeteners, high fructose corn syrup, gluten, and processed meats. Among pharmaceutical and integrative therapeutic approaches, >25% of respondents reported over-the-counter drugs, probiotic supplements, therapy (to reduce stress), and meditation.

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Severity of regular symptoms ( $\beta=.281, p<.001$ ) but not flare-ups, age ( $\beta=-.191, p<.001$ ), but not years experiencing symptoms, and BMI ( $\beta=.117, p=.015$ ) were predictive of depression severity (Table 2).

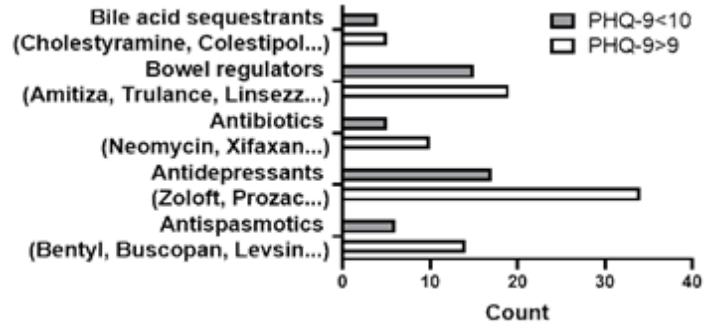
**Table 1** Characteristics of study participants

	All N (%)	Female N (%)	Male N (%)
Diagnosed Irritable Bowel Syndrome	252 (63)	222 (64.3)	30 (54.5)
Autoimmune Disease	50 (12.5)	47 (13.6)	3 (5.5)
Diagnosed Food Allergy	113 (28.2)	100 (29)	13 (23.6)
Spoken to a healthcare provider	323 (80.8)	281 (81.4)	42 (76.4)
PHQ-9 Score, Mean (Standard Deviation)	11.6 (6.1)	11.6 (6.1)	11.4 (6.1)
<b>Approaches taken within last 3 months to manage symptoms</b>			
Diet	292 (73)	247 (71.6)	45 (81.8)
Supplements or herbal therapies	125 (31.3)	108 (31.3)	17 (30.9)
Over the counter treatments	212 (53)	185 (53.6)	27 (49.1)
Lifestyle change to reduce stress	182 (45.5)	153 (44.3)	29 (52.7)
Altered exercise routine	79 (19.8)	66 (19.1)	13 (23.6)
Prescription medications	81 (20.3)	69 (20)	12 (21.8)
<b>Duration of symptoms</b>			
<6 months	16 (4)	14 (4.1)	2 (3.6)
6 months – 1 year	16 (4)	14 (4.1)	2 (3.6)
1-3 years	70 (17.5)	55 (15.9)	15 (27.3)
3-5 years	70 (17.5)	62 (18)	8 (14.5)
5-10 years	90 (22.5)	79 (22.9)	11 (20)
>10 years	138 (34.5)	121 (35.1)	17 (30.9)

**Table 2.** Backward stepwise regression of factors affecting depression severity

Model		Beta	p-value
<b>1</b>	(Constant)		<.001
	BMI	0.116	0.016
	Formal Diagnosis	-0.071	0.152
	Age	-0.182	<.001
	Diagnosed food allergies	-0.012	0.801
	Daily symptom severity	0.239	<.001
	Flare-up symptom severity	0.091	0.105
	Symptom duration	-0.043	0.398
<b>5</b>	(Constant)		<.001
	BMI	0.117	0.015
	Age	-0.191	<.001
	Daily symptom severity	0.281	<.001

A limited number of respondents reported taking prescription medications within the past three months. When comparing individuals with no or low depression (PHQ-9 scores less than 10) to those with moderate or severe depression, a greater proportion of patients with greater depressive symptoms reported taking several drug types, including antidepressants (Figure 1).



**Figure 1.** Medications taken by patients with IBS by depression severity.

Over 80% of the individuals had spoken to a healthcare provider about their symptoms. Many tried a variety of different treatment options, with the most popular being diet changes. 73% of individuals made some sort of alteration to their diet by removing certain foods, making it the leading treatment option in the last three months. Following behind that were over-the-counter treatments and lifestyle adjustments to reduce stress, without about half of the sample size trying each, respectively. Supplements and herbal therapies were tried by about a third of the sample size, while prescription medications were only tried by 1/5 of the individuals in the last 3 months.

Among respondents, 35.5% had experienced IBS symptoms for more than ten years, which aligns with the chronic nature of the disease. Given the greater update of dietary and lifestyle modifications compared to pharmaceutical treatment, it appears integrative and holistic approaches are most often sought after and/or retained as approaches.

Contrary to our hypothesis, we found that the most effective and common foods to remove were not entirely consistent with the most commonly prescribed IBS diet, which omits fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (FODMAPs). The most commonly avoided foods were primarily dairy, wheat, artificial sweeteners, and legumes. Another common group emerged of red meats, including lamb, sausage, and beef. Although not commonly listed as a problematic food group, red meats do seem to contribute to IBS symptom presentation. Another unexpected finding was that many found success with removing fermented vegetables. Although fermented

foods contain live probiotics, they seem to be aggravating for the majority of respondents.

Among this large and potentially representative sample of US adults with IBS, depression was highly prevalent, and numerous approaches were reported for symptom management. Improving access to medical care for referral to mental health and nutrition professionals is important for reducing symptom burden and improving QOL in IBS patients. It is unknown whether long-term use of over-the-counter products, which were commonly used among the majority of patients, can exacerbate symptoms, so lifestyle and dietary approaches are tools that can improve several domains of health. Multidisciplinary management of IBS is essential for improved QOL and symptom management in this population. [12]

### Statement of Research Advisor

This has been an exciting project that was conceptualized by Ms. Greene, and was developed methodically over several months. The journal articles resulting from this research will be highly cited, but more importantly, will help provide guidance and answers for individuals suffering from a highly undertreated medical condition. Excellent work, Janie!

- Drew Frugé, Department of Nursing, College of Nursing

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## Authors Biography



Jane Greene is a junior-year student studying Nutrition and Dietetics. While completing her undergraduate degree, she has worked with several dietitians who specialize in holistic healthcare. Her area of interest includes the gut microbiome and its impact on mental health, immune function, and overall prevention of future disease.



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Drew Frugé is an Associate Professor and Registered Dietitian in the Auburn University College of Nursing. His research spans many domains of health including disease prevention, improving quality of life, and improving physical performance.