

# Research Review

## Yoga in the Management of Irritable Bowel Syndrome

Shokufeh Tavassoli

University of Bristol, UK

**Abstract:** *Irritable bowel syndrome (IBS) is one of the most common functional gastrointestinal conditions, and conventional medical treatments do not always provide satisfactory relief. There is increasing evidence emerging for the use of psychological approaches in the management of IBS. This review summarizes the evidence for using Yoga in the management of IBS, as well as some possible mechanisms by which Yoga is beneficial for individuals with IBS. Basic Yoga practice recommendations are provided, offering a simple approach that can be easily adopted by individuals with IBS, or by Yoga teachers and healthcare professionals who work with them.*

**Keywords:** *Yoga, irritable bowel syndrome, pain, anxiety, relaxation, complementary medicine.*

**Correspondence:** *Shokufeh Tavassoli at the University of Bristol, 69 St Michael's Hill, Bristol, BS2 8DZ, UK. Email: st2563@bristol.ac.uk*

### Introduction

Irritable bowel syndrome (IBS) is a chronic condition characterized by abdominal pain, dysfunction in bowel habits, abdominal bloating, and the sensation of incomplete evacuation. It is one of the most common functional gastrointestinal conditions. IBS affects about 10–15% of the adult population in the United Kingdom<sup>1</sup> and the United States,<sup>2</sup> and women are more likely to suffer from this condition than men.<sup>3</sup>

IBS is considered to be a multifactorial condition that involves disordered gut motility, intestinal inflammation, visceral hypersensitivity, and both genetic and environmental factors.<sup>4</sup> Additionally, IBS is thought to result from the dysregulation of brain–gut neuroenteric systems.<sup>5–6</sup> This may explain why emotional stress and anxiety can exacerbate symptoms.<sup>7</sup>

Treatments for IBS generally follow a symptom-directed pharmacological approach, including antispasmodic agents, antidiarrheal agents, and tricyclic antidepressants.<sup>8</sup> However, response to these medical treatments is variable,

and there is limited evidence regarding their safety, efficacy, and tolerability.<sup>9</sup>

Because the symptoms of IBS develop as a response to a variety of physical, psychological, and social factors, treatment should include psychological and mind-body approaches as well as pharmacological ones.<sup>10</sup> Psychological treatments found to be useful include cognitive behavioural therapy<sup>11–12</sup> and hypnotherapy.<sup>13–14</sup> More recently, Yoga has been found to be beneficial to patients with IBS.<sup>15–16</sup>

Yoga is a holistic path that incorporates diet, breathing, physical exercise (in the form of Yoga postures), relaxation, mindset, and meditation. The combination of these factors gives the Yogi remarkable physical, mental, and spiritual benefits. Many Yoga practices may be beneficial in the management of IBS, including specific postures, breathing techniques, and dietary changes. Individuals with IBS may also benefit from the overall psychological benefits associated with Yoga practice.

This review will first consider the evidence for the use of Yoga in the management of IBS, and secondly, the mechanisms for how Yoga may be of benefit. Based on the

evidence and these proposed mechanisms, the article then describes a simple approach to Yoga that can be adopted by patients to help improve their symptoms and overall sense of well-being.

## What evidence is there for using Yoga in the management of IBS?

Only two peer-reviewed published studies have reported the effects of Yoga for individuals with IBS. A randomized controlled study conducted by Taneja and colleagues (2004) compared the effects of Yoga to medical treatment in diarrhea-predominant IBS.<sup>15</sup> Twenty-two male patients (mean age  $30.9 \pm 6.79$  years) with medically diagnosed IBS were randomly allocated into either a conventional treatment group ( $n = 13$ ) or Yoga group ( $n = 9$ ) for two months. The treatment group received symptomatic treatment with loperamide, an opioid-receptor agonist that decreases the motility of the smooth muscles of the intestinal wall. The Yoga group was taught a Yoga protocol and advised to do this twice a day (morning and evening). The Yoga protocol consisted of *vajrasana* (thunderbolt pose), *shashankasana* (hare pose), *ustrasana* (camel pose), *marjariasana* (cat pose), *bhujangasana* (cobra pose), *dhanurasana* (bow pose), *padahasthasana* (standing hands-to-feet pose), *trikonasana* (triangle pose), *paschimottanasana* (seated forward fold) and *surya nadi pranayama* (right-nostril inhalation with left-nostril exhalation).

Following the two-month trial period, both groups showed significant improvements in bowel symptoms as assessed by a bowel symptom questionnaire. No significant differences were found between the two groups, suggesting Yoga to be as beneficial as loperamide treatment in the management of diarrhea-predominant IBS. Additionally, the Yoga group was found to have enhanced parasympathetic activation, as measured by higher expiratory-to-inspiratory ratio of R–R intervals in the ECG of a deep-breathing test. Both groups showed a reduction in state anxiety, but this reduction tended to be greater in the Yoga group. Although this study was conducted on a relatively small sample, it provides evidence to support the use of Yoga in the treatment of IBS. It is possible that the enhanced parasympathetic activity and reduced anxiety seen in the Yoga group played a role in the reduction of clinical IBS symptoms.

Additional support for the use of Yoga comes from a 2006 study of adolescents with IBS.<sup>16</sup> Twenty-five adolescents aged 11–18 years were randomly allocated to either a Yoga group or waiting-list control group. The Yoga group was given one hour of in-person instructional practice from

## Yoga Practices Beneficial for IBS

*Pranayama (Breathing):* A simple practice to begin with is to gently place the hands on the abdomen and breathe deeply, observing the movement of the abdomen. Alternate nostril breathing can also be practiced to balance the autonomic nervous system.

*Warm-Ups on Hands and Knees:* Head-to-knee pose (alternating sides) helps to relieve abdominal bloating. Cat/cow, followed by *balasana* (child's pose), can help relieve constipation and bloating.

*Inversion:* A gentle inversion, *viparita karani* (legs-up-the-wall pose), can be very relaxing both at the start of the session and again before final relaxation. It may be helpful in relieving symptoms of diarrhea.

*Forward bends:* *Paschimottanasana* (seated forward bend) and *padahasthasana* (standing hands-to-feet pose) can help calm the nerves and relax the mind.

*Back bends:* *Setu bandhasana* (bridge pose) can help relieve abdominal cramps and diarrhea. *Bhujangasana* (cobra pose), *shalabhasana* (locust pose), and *dhanurasana* (bow pose) may encourage the circulation of blood to the abdominal organs and massage the abdominal organs. This can help relieve digestive complaints and constipation.

*Twists and side bends:* Twisting postures and side bends, including *trikonasana* (triangle pose), improve circulation to the abdominal organs. They help to improve digestion and can relieve constipation.

*Relaxation:* In *savasana* (corpse pose), a focus on deep abdominal breaths relaxes the whole body and mind. Observing the natural rise and fall of the abdomen with each breath and becoming aware of the abdominal organs enhances the relaxation effect. With each exhalation, the Yogi may mentally repeat, "I relax my abdominal organs [or belly]; my abdominal organs are relaxed."

an Iyengar-trained Yoga teacher, followed by four weeks of daily home practice guided by a video. The daily practice video was 10 minutes long and began with abdominal breathing in a supine position. The postures included cat pose, *balasana* (child pose), *setu bandhasana* (bridge pose), a seated twist, and a standing forward bend. Participants were encouraged to breathe mindfully in each pose and to notice abdominal sensations, including pain, as they practiced. They also were given strategies for releasing tension

and pain, such as “Rub your hands together, making them warm, and place them on your body where you feel the pain or tightness,” and “Take a deep breath in, and as you exhale, let the pain out.”

Following the four-week period, adolescents in the Yoga group reported lower levels of anxiety and had significantly lower scores for gastrointestinal symptoms, as assessed by a questionnaire, compared to the waiting-list control group. Although this study provides further evidence for the benefits of Yoga, the sample size was again relatively small and the Yoga intervention was compared to a waiting-list control. It would have been interesting to compare the effects of Yoga to currently used treatments.

Relaxation is an important part of Yoga, but interestingly, simple relaxation has not been found to provide any additional benefits compared to standard medical care.<sup>17</sup> In one eight-week randomized controlled study, no significant differences were found in IBS symptom frequency between standard care (three consultations with a gastroenterologist, dietary advice, and the bulking agent psyllium husk taken daily) and standard care plus relaxation therapy. A limitation of this study, however, is that the relaxation therapy consisted of only one 30-minute session per week. In the Yoga studies described above, practices were done daily. It is possible that additional benefits would have been seen with relaxation therapy if this had been done daily. For benefits to be seen with Yoga, as well as with relaxation therapy, regular practice is required. However, when thinking about how Yoga can be offered to individuals with IBS, it is important to keep in mind that Yoga cannot be oversimplified to “relaxation” practices.

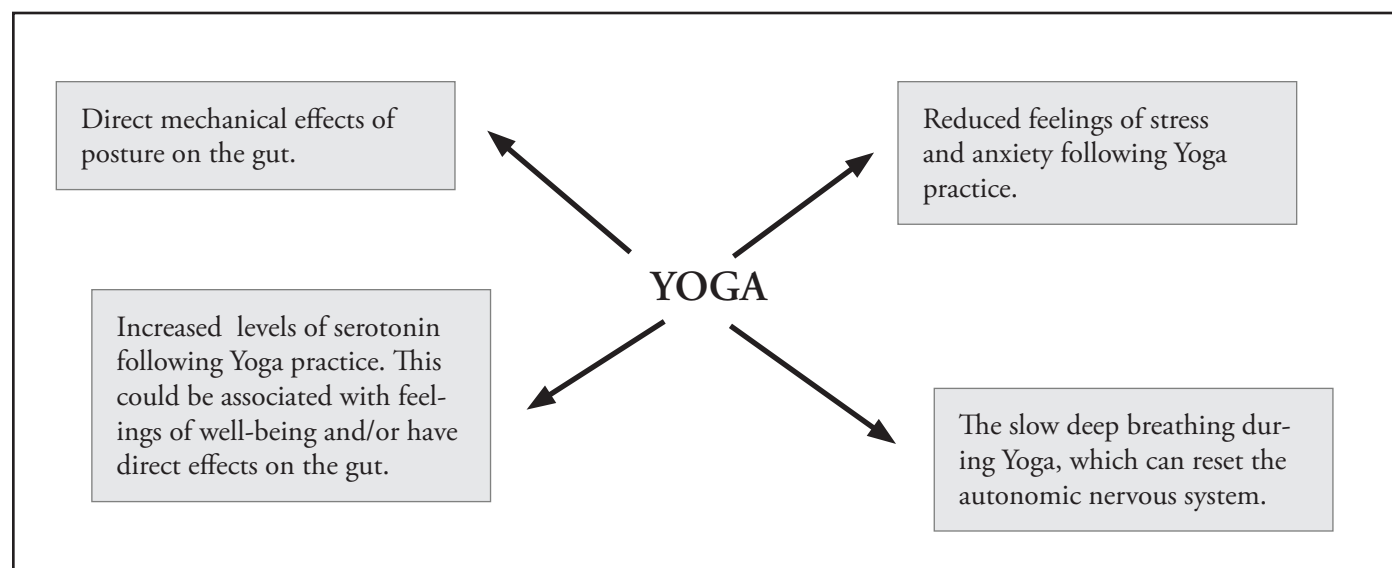
## How does Yoga help in the management of IBS?

The symptoms of IBS are thought to occur due to disturbed brain–gut interactions at many levels: the central nervous system, autonomic nervous system, enteric nervous system, and gut musculature.<sup>18</sup> Yoga could be acting at any of these levels.

Certain postures, such as the ones used in the studies described, may be acting at a peripheral level by massaging the gut smooth muscle. Holding these postures may create pressure changes in visceral organs, which stimulate visceral afferents, and thus affect neural and visceral activity.<sup>15</sup>

Yoga may also act more globally by influencing psychological stress and well-being. It is not clear whether stress is a causal factor in IBS, but it can certainly exacerbate symptoms in patients with IBS.<sup>7,19–22</sup> Yoga is well-documented to reduce feelings of stress and anxiety<sup>23–26</sup> and increase feelings of well-being.<sup>27–28</sup> It is possible that these changes in stress and mood modulate the autonomic nervous system, endocrine system, enteric nervous system, and their interactions.

More specifically, both sympathetic and parasympathetic autonomic nervous system (ANS) function may be dysregulated in individuals with IBS.<sup>29–31</sup> Stress hormone levels, such as adrenaline or cortisol, may be raised in IBS patients as a result of dysregulation in the hypothalamic-pituitary-adrenal (HPA) axis.<sup>32–33</sup> Yoga can influence both the ANS and HPA. For example, slow deep Yogic breathing is thought to reset the autonomic nervous system in favor of



**Figure 1.** Proposed mechanisms for the effects of Yoga on IBS.

parasympathetic activation.<sup>34</sup> Yoga practice is also associated with decreased levels of the stress hormone cortisol<sup>26</sup> and increased levels of GABA,<sup>35</sup> a neurotransmitter associated with inhibiting anxiety and stress.

Other chemical changes may also contribute to the beneficial effects of Yoga. Recent treatments for IBS have aimed at modifying the effects of serotonin (5-hydroxytryptamine or 5-HT) on the gut,<sup>36-37</sup> and Yoga practice has been shown to increase levels of serotonin,<sup>38</sup> which is a neurotransmitter associated with both mood and the function of the digestive system. Administration of the hormone melatonin has also been shown to improve abdominal pain in IBS patients with sleep disturbances,<sup>39</sup> and Yoga is associated with increased levels of melatonin.<sup>40</sup>

The effects of Yoga on all of these neurochemical systems may provide a further explanation for its benefits. The proposed physiological mechanisms through which Yoga may be acting are summarized in Figure 1. Other aspects of the Yogic lifestyle, including dietary factors and meditation, are also likely to be valuable. Further research is needed to determine which specific Yoga practices are the most helpful, as well as the mechanisms through which they improve symptoms of IBS.

## Conclusions

IBS is a challenging condition to manage, and current pharmacological treatments do not provide adequate relief for the majority of patients. This review has highlighted promising evidence regarding the use of Yoga for IBS. Yoga acts holistically to promote physical, psychological, and spiritual well-being, and its practices can be easily adopted by most patients. Yoga has great potential to be used alongside conventional medical therapy in the management of IBS.

## References

1. Wilson S, Roberts L, Roalfe A, Bridge P, Singh S. Prevalence of irritable bowel syndrome: a community survey. *British Journal of General Practice*. 2004;54: 495-502.
2. Hungin APS, Chang L, Locke GR, Dennis EH, Barghout V. Irritable bowel syndrome in the united states: prevalence, symptom patterns and impact. *Alimentary Pharmacology & Therapeutics*. 2005;21(11):1365-1375.
3. Mertz HR. Irritable bowel syndrome. *New England Journal of Medicine*. 2003;349:2136-2146.
4. Drossman DA, Camilleri MM, Mayer EA, Whitehead WE. AGA technical review on irritable bowel syndrome. *Gastroenterology* 2002;123:2108-2131.
5. Drossman DA, Creed FH, Olden KW, Svedlund J, Toner BB, Whitehead WE. Psychosocial aspects of the functional gastrointestinal disorders. *Gut*. 1999;45:Suppl 2,II25-1130.
6. Longstreth GF, Thompson WG, Chey WD, Houghton LA, Mearin F, Spiller R. Functional bowel disorders. *Gastroenterology*. 2006;130:1480-1491.
7. Mayer EA. The neurobiology of stress and gastrointestinal disease. *Gut*. 2000;47:861-869.
8. Hadley SK, Gaareder SM. Treatment of irritable bowel syndrome. *American Family Physician*. 2005;72:2501-2506.
9. Tack J, Fried M, Houghton LA, Spicak J, Fisher G. Systematic review: the efficacy of treatments for irritable bowel syndrome--a European perspective. *Alimentary Pharmacology & Therapeutics*. 2006;24:183-205.
10. Hayee B, Forgacs I. Psychological approach to managing irritable bowel syndrome. *British Medical Journal*. 2007;334:1105-1109.
11. Hutton J. Cognitive behaviour therapy for irritable bowel syndrome. *European Journal of Gastroenterology & Hepatology*. 2005;17:11-14.
12. Toner BB. Cognitive-behavioural treatment of irritable bowel syndrome. *CNS Spectrums*. 2005;10:883-890.
13. Whorwell PJ. Review article: the history of hypnotherapy and its role in the irritable bowel syndrome. *Alimentary Pharmacology & Therapeutics*. 2005;22:1061-1067.
14. Wilson S, Maddison T, Roberts L, Greenfield S, Singh S. Systematic review: the effectiveness of hypnotherapy in the management of irritable bowel syndrome. *Alimentary Pharmacology & Therapeutics* 2006;24:769-780.
15. Taneja I, Deepak KK, Poojary G, Acharya I.N, Pandey RM, Sharma MP. Yogic versus conventional treatment in diarrhea-predominant irritable bowel syndrome: a randomized control study. *Applied Psychophysiology & Biofeedback* 2004;29:19-33.
16. Kuttner L, Chambers CT, Hardial J, Isreal DM, Jacobson K, Evans K. A randomized trial of yoga for adolescents with irritable bowel syndrome. *Pain Research & Management*. 2006;11:217-223.
17. Boyce PM, Talley NJ, Balaam B, Koloski NA, Truman G. A randomized controlled trial of cognitive behavior therapy, relaxation training, and routine clinical care for the irritable bowel syndrome. *American Journal of Gastroenterology*. 2003;98:2209-2218.
18. McKee DP, Quigley EM. Intestinal motility in irritable bowel syndrome: is IBS a motility disorder? Part 2. Motility of the small bowel, esophagus, stomach, and gall-bladder. *Digestive Diseases & Sciences*. 1993;38:1773-1782.
19. Levy RL, Cain KC, Jarrett M, Heitkemper MM. The relationship between daily life stress and gastrointestinal symptoms in women with irritable bowel syndrome. *Journal of Behavioural Medicine*. 1997;20:177-193.
20. Dancy CP, Taghavi M, Fox RJ. The relationship between daily stress and symptoms of irritable bowel: a time-series approach. *Journal of Psychosomatic Research*. 1998;44:537-545.
21. Hertig VL, Cain KC, Jarrett ME, Burr RL, Heitkemper MM. Daily stress and gastrointestinal symptoms in women with irritable bowel syndrome. *Nursing Research*. 2007;56:399-406.
22. Faresjo A, Grodzinsky E, Johansson S, Wallander MA, Timpka T, Akerlind I. Psychosocial factors at work and in every day life are associated with irritable bowel syndrome. *European Journal of Epidemiology*. 2007;22:473-480.
23. Sahasi G, Mohan D, Kacker C. Effectiveness of yogic techniques in the management of anxiety. *Journal of Personality & Clinical Studies*. 1989;5:51-55.
24. Malathi A & Damodaran A. **Stress due to exams in medical students: Role of yoga.** *Indian Journal of Physiology and Pharmacology*. 1999;43:218-224.
25. Kennedy JE, Abbott RA, Rosenberg BS. Changes in spirituality and well-being in a retreat program for cardiac patients. *Alternative therapies in health and medicine*. 2002;8:64-66.
26. Michalsen A, Grossman P, Acil A, Langhorst J, Ludtke R, Esch T, Stefano GB & Dobos GJ. Rapid stress reduction and anxiolysis among distressed women as a consequence of a three-month intensive yoga program. *Medical Science Monitor*. 2005;11:CR555-561.



27. Muller S, Dennis D, Gorow T. Emotional well-being of college students in health courses with and without an exercise component. *Perceptual & Motor Skills*. 2006;103:717-725.
28. Impett E, Daubenmier J, Hirschman A. Mind the body: Yoga embodiment and well-being. *Sexuality research & Social policy*. 2006;3:39-48.
29. Mazur M, Furgala A, Jablonski K, Madroszkiewicz D, Cieccko-Michalska I, Bugajski A, Thor PJ. Dysfunction of the autonomic nervous system activity is responsible for gastric myoelectric disturbances in the irritable bowel syndrome patients. *Journal of Physiology & Pharmacology*. 2007;58:Suppl 3,131-139.
30. Waring WS, Chui M, Japp A, Nicol EF, Ford MJ. Autonomic cardiovascular responses are impaired in women with irritable bowel syndrome. *Journal of Clinical Gastroenterology*. 2004;38:658-663.
31. van Orshoven NP, Andriess GI, van Schelven LJ, Smout AJ, Akkermans LM, Oey PL. Subtle involvement of the parasympathetic nervous system in patients with irritable bowel syndrome. *Clinical Autonomic Research*. 2006;16:33-39.
32. Chang L, Sundaresh S, Baldi P, Licudine A, Mayer M, Vuong T, Hirano M, Olivas TI, Liu C, Naliboff BD, Mayer EA. Dysregulation of basal circadian and pulsatile secretion of hypothalamic-pituitary-adrenal (HPA) axis in irritable bowel syndrome and fibromyalgia. *Gastroenterology*. 2005;128:A620-A621.
33. Walter SA, Aardal-Eriksson E, Thorell LH, Bodemar G, Hallbook O. Pre-experimental stress in patients with irritable bowel syndrome: high cortisol values already before symptom provocation with rectal distensions. *Neurogastroenterology & Motility*. 2006;18:1069-1077.
34. Jerath R, Edry JW, Barnes VA, Jerath V. Physiology of long pranayamic breathing: neural respiratory elements may provide a mechanism that explains how slow deep breathing shifts the autonomic nervous system. *Medical Hypotheses*. 2006;67:566-571.
35. Streeter CC, Jensen JE, Perlmutter RM, Cabral HJ, Tian H, Terhune DB, Ciraulo DA, Renshaw PF. Yoga asana sessions increase brain GABA levels: a pilot study. *Journal of Alternative & Complementary Medicine*. 2007;13:419-426.
36. Tabas G, Beaves M, Wang J, Friday P, Mardini H, Arnold G. Paroxetine to treat irritable bowel syndrome not responding to high-fiber diet: a double-blind, placebo-controlled trial. *American Journal of Gastroenterology*. 2004;99:914-920.
37. Farthing MJG. Treatment of irritable bowel syndrome. *British Medical Journal*. 2005;330:429-430.
38. Walton KG, Pugh ND, Gelderloos P, Macrae P. Stress reduction and preventing hypertension: preliminary support for a psychoneuroendocrine mechanism. *Journal of Alternative & Complementary Medicine*. 1995;1:263-283.
39. Song GH, Leng PH, Gwee KA, Mochhala SM, Ho KY. Melatonin improves abdominal pain in irritable bowel syndrome patients who have sleep disturbances: a randomised, double blind, placebo controlled study. *Gut*. 2005;54:1402-1407.
40. Harinath K, Malhotra AS, Pal K, Prasad R, Kumar R, Kain TC, Rai L, Sawhney RC. Effects of hatha yoga and omkar meditation on cardio-respiratory performance, psychologic profile, and melatonin secretion. *Journal of Alternative & Complementary Medicine*. 2004;10:261-268.