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# The invisible burden of gut-mind disorders among women: A yogic and psychosomatic review

**Shalini Agarwal**
1244/F-2, Block D, Radha Govind Marg,
Rani Sati Nagar, Brijlalpura, Ajmer Road,
Jaipur, Rajasthan 302019
agarwal.shalini1974@gmail.com

**Abstract**

*Gut-mind disorders, commonly conceptualized within functional gastrointestinal disorders and increasingly framed as disorders of gut-brain interaction, represent a substantial, frequently under-recognized burden among women. This review advances "the invisible burden" as an analytic lens to synthesize how gendered health inequities, stigma, and psychosocial stressors shape symptom experience, help-seeking, and clinical trajectories in irritable bowel syndrome (IBS) and related conditions. Epidemiologic syntheses indicate IBS is prevalent globally and is associated with sex-linked patterns in risk and presentation, while contemporary models emphasize bidirectional signaling across the gut-brain axis involving autonomic, immune, endocrine, and microbiota-related pathways. In parallel, scholarship on gender inequity in health highlights structural and interpersonal processes, such as normalization of women's pain and diminished credibility in clinical encounters, that can compound suffering and delay effective care. This review further examines yogic psychology as a complementary interpretive framework, drawing on classical constructs (e.g., citta, prāṇa, agni) to theorize how persistent stress and dysregulation may be embodied as digestive disturbance and heightened visceral sensitivity. Empirical studies of yoga-based interventions, including structured multi-component programs and remotely delivered Hatha yoga, suggest potential benefits for IBS symptom severity, quality of life, and stress-related outcomes, though methodological heterogeneity remains a key limitation. We argue that integrating yogic practices within trauma-informed, gender-responsive, and biopsychosocial care pathways may reduce the invisible burden by supporting autonomic regulation, emotional agency, and interoceptive awareness.*

***Keywords*:** invisible burden; women's health; irritable bowel syndrome; disorders of gut-brain interaction; gut-brain axis; stigma; ywoga; psychosomatic medicine.

## 1. Introduction

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Irritable bowel syndrome (IBS) is a common chronic disorder characterized by recurrent abdominal pain and altered bowel habits, often producing substantial impairment in daily functioning and quality of life. Global evidence indicates meaningful prevalence across regions and identifies risk factors that include sex-linked patterns, with women frequently represented prominently in clinical samples and care-seeking contexts (Lovell & Ford, 2012).

Contemporary gastroenterology has increasingly emphasized that IBS and related functional gastrointestinal disorders are not best understood through a narrow structural lesion paradigm, but rather through models that foreground dysregulation across the gut-brain axis, incorporating neural, endocrine, immune, and microbiota-mediated processes (Carabotti et al., 2015; Mayer et al., 2015).

Yet, the clinical and psychosocial realities of IBS are not evenly distributed. Gender inequity in health, arising from norms, institutions, and interpersonal practices, can shape who is believed, who is investigated, who receives supportive treatment, and whose pain is normalized (Sen & Östlin, 2008; World Health Organization). In this context, women's gut-mind disorders may become "invisible" not because symptoms are mild, but because the conditions are stigmatized, contested, or framed as "less legitimate," thereby increasing cumulative psychosomatic strain (Hearn et al., 2020).

This review therefore pursues two linked aims. First, it synthesizes biomedical and psychosomatic literature to describe mechanisms through which chronic stress, stigma, and autonomic dysregulation can interact with gut-brain pathways in women. Second, it evaluates yoga, conceptualized both as a therapeutic practice and as a psychosomatic model, regarding its potential to reduce symptom burden and to support gender-responsive, holistic care.

## 2. Conceptual Framework: "The Invisible Burden"

### 2.1 Defining the construct

"The invisible burden" is used here to denote the **cumulative, frequently under-recognized load** experienced by women living with gut-mind disorders, constituted by (a) persistent symptoms and functional impairment, (b) uncertainty and contested legitimacy of diagnosis, (c) stigma and embarrassment linked to bowel symptoms, and (d) gendered social expectations that normalize pain or require ongoing emotional labor in family and workplace roles. This framing aligns with broader analyses of gender inequity in health, where unequal social power and discriminatory practices shape health risks and access to care (Sen & Östlin, 2008; WHO).

### 2.2 Stigma and contested legitimacy

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IBS is frequently stigmatized, in part because bowel symptoms are culturally taboo and because the condition is often perceived, incorrectly, as "merely psychosomatic." In a major review, stigma around IBS was described as prevalent among the public and even within healthcare settings, with downstream consequences including distress, reduced quality of life, and problematic care experiences (Hearn et al., 2020). Such stigma is not peripheral; it is plausibly mechanistic, insofar as shame, anticipatory anxiety, and social threat can amplify symptom vigilance and stress reactivity.

### 2.3 Gendered pain bias and clinical dismissal

The invisible burden is also intensified by gendered expectations about pain expression and credibility. Classic scholarship has documented bias against women in pain treatment and interpretation within healthcare encounters (Hoffmann & Tarzian, 2001). When women's abdominal pain is minimized, attributed to emotionality, or framed as "normal," delays in effective treatment and escalation of distress can occur, dynamics that are especially consequential for disorders characterized by chronic pain and uncertainty.

## 3. Methods: Review Design and Scope

This article is a **narrative, integrative review** synthesizing interdisciplinary literature across gastroenterology, psychosomatic medicine, women's health, stigma research, and yoga-based intervention studies. Priority was given to (a) high-quality reviews and guidelines relevant to IBS management, (b) foundational gut-brain axis papers clarifying biological pathways, (c) gender inequity frameworks, and (d) clinical trials and systematic reviews evaluating yoga for IBS. Because outcome measures and yoga protocols vary substantially across studies, findings are synthesized thematically rather than pooled quantitatively.

## 4. Gut-Brain Axis and Psychosomatic Mechanisms in IBS

### 4.1 From "biomedical" to biopsychosocial and systems views

The persistence of IBS symptoms despite normal structural findings has historically reinforced a false dichotomy between "real" disease and "psychological" disease. A biopsychosocial model explicitly rejects this split, arguing that illness arises through interactions among biological processes, psychological states, and social contexts (Engel, 1977). In IBS, this integrative stance is increasingly reflected in modern gut-brain interaction frameworks, which emphasize bidirectional signaling and multi-level regulation rather than a single causal lesion.

### 4.2 Microbiota-gut-brain communication

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The gut-brain axis includes central and enteric nervous systems, the autonomic nervous system, and endocrine and immune pathways through which stress and affective states can influence gastrointestinal function (Carabotti et al., 2015). In parallel, microbiota-related signaling can shape neuroimmune tone and stress responsivity, providing plausible routes by which dysbiosis and stress exposure interact over time (Mayer et al., 2015).

### 4.3 Autonomic dysregulation and vagal pathways

A growing body of work emphasizes the vagus nerve as a critical interface within microbiota-gut-brain signaling, linking stress physiology to gastrointestinal motility, inflammation, and symptom amplification. Reviews highlight that stress can inhibit vagal tone and that low vagal tone has been described in IBS, with implications for inflammation and dysbiosis-related pathways (Bonaz et al., 2018). This is clinically relevant because many mind-body interventions, including yogic breathing and meditation, explicitly target parasympathetic regulation and may thereby influence symptom modulation through autonomic mechanisms.

## 5. Women's Health, Gender Inequity, and the Social Production of Symptom Burden

### 5.1 Structural determinants and health inequities

Gender inequity in health operates through constrained access to resources, discriminatory care practices, and exposure to gender-based violence and chronic social stressors (Sen & Östlin, 2008; WHO). Such inequities matter for IBS because chronic stress is not merely a psychological correlate; it is a physiological signal that can shift autonomic balance, immune tone, and pain sensitivity across the gut-brain axis.

### 5.2 Stigma as a chronic stressor

Stigma functions as a social stressor that can be internalized (shame), anticipated (fear of judgment), or enacted (discrimination). Hearn et al. (2020) emphasized that IBS stigma is common and associated with worse outcomes, including psychological distress and impaired quality of life. For women, stigma may be compounded by gendered expectations of bodily control, cleanliness, and emotional composure, increasing concealment and reducing open symptom communication in both social and clinical settings.

### 5.3 Clinical invisibility and the normalization of pain

Pain bias is not simply an interpersonal slight; it can produce measurable clinical harms when symptom reports are minimized, diagnostic pathways delayed, or supportive therapies withheld. The analysis by Hoffmann and Tarzian (2001) remains influential in describing systemic under-treatment and skepticism toward women's pain. In IBS, where diagnostic legitimacy is

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already contested, gendered pain bias can intensify the "invisible burden" by layering invalidation onto chronic symptoms.

## 6. Yogic Psychology as a Complementary Lens

### 6.1 Classical constructs: *citta*, *prāṇa*, and *agni*

Classical yoga philosophy frames suffering and dysregulation not only through external events but through patterns of mental fluctuation and embodied reactivity. In the *Yoga Sūtras*, *citta* refers to mental processes, including attention, affective tone, and habitual reactivity (Patañjali, 2009). In Haṭha traditions, *prāṇa* is often linked to vitality and regulation, while *agni* denotes digestive-metabolic "fire" (Svātmārāma, 1993). Within this lexicon, chronic stress and unresolved reactivity may be conceptualized as disturbances in mental steadiness (*citta-vṛtti*), autonomic vitality (*prāṇic* imbalance), and digestive regulation (*agni*).

While these constructs are not reducible to modern physiology, they can operate as a **clinically generative interpretive framework**, encouraging attention to breath, interoception, affect regulation, and daily rhythm, elements that map plausibly onto autonomic and stress-related mechanisms recognized in gut-brain models (Bonaz et al., 2018; Mayer et al., 2015).

### 6.2 A psychosomatic bridge rather than an alternative explanation

A yogic psychosomatic lens is most useful when framed as additive, not oppositional. That is, it does not replace evidence-based gastroenterology, but complements it by offering an embodied vocabulary for (a) recognizing stress physiology, (b) cultivating attentional stability, and (c) supporting behavioral routines that may reduce symptom volatility. This integrative orientation is consistent with biopsychosocial medicine (Engel, 1977) and with current clinical emphasis on combining biomedical and brain-gut behavior therapies for disorders of gut-brain interaction (Keefer et al., 2022).

## 7. Evidence Review: Yoga-Based Interventions for IBS and Related Outcomes

### 7.1 Overview of the evidence base

Systematic review evidence suggests yoga may improve IBS symptoms, anxiety, and quality of life, but also emphasizes methodological limitations across trials (e.g., heterogeneous protocols, unclear risk of bias, inconsistent outcome measures) (Schumann et al., 2016). A state-of-the-art narrative review similarly concludes that yoga appears safe and potentially effective while underscoring evidence quality constraints and heterogeneity (D'Silva et al., 2020).

### 7.2 Selected trials

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**Remedial yoga module (12 weeks).**

In a randomized controlled trial, a comprehensive remedial yoga module delivered over 12 weeks was associated with significant improvements in IBS symptom severity and IBS-specific quality of life compared to a wait-list control, along with improvements in anxiety/depression measures and autonomic symptom scores (Kavuri et al., 2015).

**Adolescents with IBS (4 weeks).**

A randomized trial in adolescents found yoga to be associated with improvements in functional disability and anxiety, with combined analyses suggesting reduced gastrointestinal symptoms following the intervention (Kuttner et al., 2006). Although pediatric samples differ from adult women's experiences, this trial is relevant because it supports feasibility and symptom modulation via mind-body practice early in illness trajectories.

**Virtual Hatha yoga (8 weeks).**

A recent randomized clinical trial evaluating virtually delivered Hatha yoga reported that IBS symptom severity decreased significantly within the yoga group, and improvements were observed in quality of life, fatigue, and perceived stress; however, based on the primary endpoint the intervention was not superior to advice-only control (D'Silva et al., 2023). Notably, the sample was predominantly women, strengthening interpretability for women's health contexts (D'Silva et al., 2023).

### 7.3 What yoga seems to improve most consistently

Across trials and reviews, the most consistent signals of benefit appear in (a) perceived stress, (b) anxiety or distress outcomes, and (c) quality of life, domains tightly linked to the "invisible burden" construct (D'Silva et al., 2020; Kavuri et al., 2015; Schumann et al., 2016). This pattern matters because an intervention that reduces symptom burden modestly but substantially improves distress and functioning may still be clinically meaningful in chronic gut-mind disorders where total symptom elimination is rare.

## 8. Mechanisms of Action: How Yogic Practice May Reduce the Invisible Burden

### 8.1 Autonomic rebalancing and vagal tone

Breath regulation and meditative attention, central to many yoga protocols, are plausible modulators of parasympathetic activity and vagal tone. Given the vagus nerve's role in gut-brain communication and stress physiology, yoga's emphasis on slow breathing and relaxation may influence symptom expression through autonomic pathways (Bonaz et al., 2018).

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### 8.2 Stress biology and cellular aging signals

Although not IBS-specific, evidence that yoga and meditation interventions can shift biomarkers associated with stress and cellular aging provides indirect support for systemic stress-buffering effects relevant to gut-brain disorders. For example, a prospective study reported changes in oxidative stress and related markers following a yoga and meditation-based lifestyle intervention (Tolahunase et al., 2017). In women with IBS, where stress amplification and symptom vigilance are common, systemic stress reduction may reduce both physiological arousal and perceived symptom threat.

### 8.3 Interoception, agency, and stigma reduction

The invisible burden is not only biological; it includes shame, concealment, and diminished agency, especially in stigmatized conditions like IBS (Hearn et al., 2020). Yogic practice trains embodied awareness (interoception) and non-reactivity, which may help individuals reinterpret internal sensations as tolerable and transient rather than catastrophic. Over time, such shifts could reduce avoidance behaviors, improve self-efficacy, and lessen the internalized stigma that compounds suffering.

## 9. Clinical and Public Health Integration: Toward Gender-Responsive Gut-Mind Care

### 9.1 Alignment with contemporary IBS management

Clinical guidance for IBS emphasizes multi-modal management and recognizes the value of behavioral and brain-gut approaches alongside dietary and pharmacologic treatments (Lacy et al., 2021). In addition, international consensus work on brain-gut behavior therapies underscores their role within disorders of gut-brain interaction, supporting the broader premise that psychological and behavioral interventions can be evidence-based components of GI care (Keefer et al., 2022).

### 9.2 Gender-responsive and trauma-informed implementation

Integrating yoga into women's gut-mind care should be explicitly gender-responsive, acknowledging that health inequities can shape exposure to chronic stress and barriers to care (Sen & Östlin, 2008; WHO). Practically, this implies (a) validating pain experiences, (b) screening sensitively for stress and trauma where appropriate, (c) offering choices and consent-based modifications (particularly for breathwork and body-focused practices), and (d) reducing access barriers through low-cost, community-based, and remote delivery models (D'Silva et al., 2023).

### 9.3 Global women's health framing

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From a public health standpoint, the invisible burden framework suggests that IBS in women should not be treated as a narrow specialty issue. Rather, it is a women's health concern shaped by inequity, stigma, and health system responsiveness (Sen & Östlin, 2008; Hearn et al., 2020). Yoga, when implemented responsibly and evaluated rigorously, may offer a culturally adaptable, low-resource adjunct to reduce suffering and improve functioning, especially in contexts where access to Psychogastroenterology services is limited.

## 10. Conclusion

Women living with IBS and related gut-mind disorders often face an "invisible burden" produced by the convergence of chronic symptoms, stigma, and gendered inequities in how pain and illness are interpreted and treated. Contemporary gut-brain models clarify that psychosocial stress is neither incidental nor "imagined," but physiologically embedded through autonomic, immune, endocrine, and microbiota-linked pathways (Carabotti et al., 2015; Mayer et al., 2015). Evidence to date suggests yoga may reduce symptom severity for some patients and improve quality of life and stress-related outcomes, though higher-quality trials and standardized protocols are still needed (D'Silva et al., 2020, 2023; Schumann et al., 2016). Integrating yoga within gender-responsive, biopsychosocial care, aligned with contemporary clinical guidance, offers a plausible pathway to reduce suffering, restore agency, and address the invisible burden as a global women's health concern (Keefer et al., 2022; Lacy et al., 2021; Sen & Östlin, 2008).

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