

Diarrhea-Predominant Irritable Bowel Syndrome (IBS-D): Gut–Brain Axis Mechanisms and Non-pharmacological Management with a South Indian Perspective

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This is a narrative (non-systematic) review intended for education and discussion. It has not undergone journal peer review. It was drafted with AI assistance for language and structuring; all content was researched, verified, and edited by the author, who takes responsibility for its accuracy. It is not medical advice — individuals with gastrointestinal symptoms should consult a qualified clinician.

Abstract

Background. Diarrhea-predominant irritable bowel syndrome (IBS-D) is a common disorder of gut–brain interaction characterized by recurrent abdominal pain with frequent, loose stools. Global and Asia–Pacific data on epidemiology and mechanisms are well described, but evidence specific to South Indian populations remains limited.

Aim. To narratively summarize current evidence on IBS-D prevalence, gut–brain axis mechanisms, and non-pharmacological management, and to highlight gaps relevant to South Indian settings, including Telangana and Andhra Pradesh.

Methods. A narrative (non-systematic) literature review was conducted using PubMed and Google Scholar, focused on IBS-D epidemiology, HPA-axis and corticotropin-releasing factor (CRF) signaling, dietary triggers (FODMAPs, capsaicin), and non-pharmacological interventions (mind–body therapies, probiotics). Articles were selected for mechanistic clarity and clinical relevance; a systematic-review protocol and formal risk-of-bias assessment were not applied.

Results. Global IBS prevalence is estimated at roughly 4–11%, with IBS-D accounting for a substantial share of cases. Asian estimates are generally reported as lower than Western figures, though diagnostic and cultural-reporting differences may contribute. Evidence supports roles for stress-induced CRF signaling, FODMAP-related luminal distension, and TRPV1-mediated responses to capsaicin, whereas robust South India–specific data are sparse. Mind–body therapies and selected probiotics show supportive but heterogeneous evidence; many traditional dietary practices remain under-studied.

Conclusion. IBS-D management benefits from integrative approaches addressing central stress physiology together with dietary and lifestyle modification. Well-designed studies in South Indian populations are needed to quantify local burden and to evaluate commonly used traditional practices within a rigorous evidence framework.

Keywords: Irritable Bowel Syndrome; Diarrhea-Predominant IBS; Gut–Brain Axis; Corticotropin-Releasing Factor; FODMAP; TRPV1

1. Introduction

Irritable bowel syndrome with diarrhea (IBS-D) is a functional gastrointestinal disorder defined under Rome IV criteria by recurrent abdominal pain associated with loose, frequent, and urgent stool passage. Beyond physical symptoms, IBS-D carries a significant burden on quality of life, work productivity, and mental well-being [1]. Epidemiological patterns in Asia differ in some respects from those in Western cohorts, and a substantial regional literature has developed to characterize this [2]. Evidence specific to South Indian states — including the dietary, occupational, and psychosocial context of Telangana and Andhra Pradesh — is not well represented in the indexed literature. This review synthesizes what is established at the global and Asia-Pacific level and identifies where regional evidence for South India is currently absent, rather than presenting unsourced regional statistics.

2. Methods

This is a narrative (non-systematic) synthesis of the literature on IBS-D, focusing on gut-brain axis mechanisms, dietary contributors, and non-pharmacological management relevant to South Asian and South Indian clinical contexts. Electronic searches were performed in PubMed/MEDLINE and Google Scholar for English-language articles published up to July 2026, using Boolean combinations of terms including "irritable bowel syndrome," "IBS-D," "gut-brain axis," "corticotropin-releasing factor," "HPA axis," "FODMAP," "capsaicin," "TRPV1," "probiotics," "mind-body therapy," "Asia," and "India." Reference lists of key reviews were screened for additional sources. No protocol was registered and systematic-review reporting guidelines (e.g., PRISMA) were not applied, as the objective was conceptual synthesis rather than exhaustive evidence aggregation. Formal risk-of-bias assessment and meta-analysis were not undertaken; readers seeking systematic synthesis are referred to dedicated systematic reviews on IBS-D.

3. Epidemiological Overview

Region	Overall IBS prevalence	Notes
Global	~4–11% (varies by criteria)	Estimates vary substantially by diagnostic criteria (Rome II/III/IV) and study design [4].
Asia (pooled)	Generally lower than Western estimates	A mix of possible true prevalence differences and symptom-reporting / cultural factors [2].
South India (Telangana / AP)	Not well characterized	No dedicated large-scale Rome IV-based prevalence study identified for this region at time of writing.

The absence of a dedicated regional dataset is itself a finding worth stating plainly — a genuine gap, not something to paper over with unsourced estimates.

4. Mechanistic Pathways

4.1 Central stress and the HPA axis

Chronic psychological stress is a well-established trigger for IBS symptom exacerbation. Stress activates the hypothalamic-pituitary-adrenal (HPA) axis, driving CRF release. CRF signaling via CRF1 receptors in the gut is mechanistically linked to enteric mast cell activation, altered motility, and visceral hypersensitivity [3] — among the most consistently replicated findings in IBS pathophysiology. Specific everyday stressors (financial pressure, commuting anxiety) are plausible examples of general life-stress rather than findings established in any published South Indian cohort.

4.2 Dietary substrates: FODMAPs and capsaicin

High-FODMAP foods can undergo fermentation and osmotic fluid shift in the colon, contributing to bloating and loose stool in susceptible individuals. Capsaicin, common in chili-forward regional cuisine, activates TRPV1 receptors on gut sensory neurons — plausibly contributing to burning sensation and altered motility in sensitized individuals. Both mechanisms are well described in the general literature; their quantitative contribution within South Indian dietary patterns has not been directly studied and represents a valuable direction for regional research.

5. Non-pharmacological Management: Evidence vs. Tradition

Approach	Evidence status	Plausible mechanism
Mind–body therapy (meditation, breathing)	Reasonably supported for IBS generally	Downregulation of the sympathetic stress response
Probiotics	Mixed; strain-specific — some help, some don't	Modulation of gut microbiota
Polyphenol-rich foods (e.g., pomegranate)	Preliminary / limited in IBS-D specifically	Proposed effects on gut barrier integrity
Traditional dietary practices (buttermilk, herbal preparations)	Traditional / anecdotal — not established by controlled trials	Unclear; plausible but unproven

The honest distinction matters: mind–body therapy and select probiotic strains have a real evidence base. Traditional practices common in South Indian households may genuinely help some individuals, but they are most accurately described as practices warranting further controlled study — not as clinically proven protocols.

6. Discussion and Limitations

The mechanistic case for a gut–brain axis contribution to IBS-D — via CRF/HPA-axis signaling and TRPV1/FODMAP-driven luminal effects — is well supported by the general literature. What is genuinely missing is dedicated epidemiological and interventional research specific to South Indian populations. This review does not attempt to fill that gap with invented figures; it flags it as a clear direction for future primary research, ideally a registered cross-sectional or cohort study using Rome IV criteria in Telangana and Andhra Pradesh clinical settings.

Limitations. This is a narrative review based on a non-exhaustive literature search and a small reference base, not a systematic review or meta-analysis. It does not report formal risk-of-bias assessment or the economic burden of IBS-D. Conclusions about traditional dietary practices are explicitly framed as unproven rather than evidence-based.

7. Conclusion

IBS-D management benefits from an integrative approach combining stress-reduction strategies with attention to dietary triggers. The underlying physiological mechanisms are well established in the general literature. South India–specific epidemiological data is a genuine, citable gap and a legitimate direction for future primary research rather than something to be filled with unsourced estimates.

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