

Pelvic Floor Dysfunction and Gut-Brain Axis: Implications for Multidisciplinary Diagnosis and Treatment in Gynecology, Gastroenterology, and General Surgery

Cindy Michelle Cedeño Calero*
<https://orcid.org/0009-0005-7505-4200>
dracindycedeno.gastro@outlook.com
Hospital de Especialidades Portoviejo
Portoviejo, Ecuador

Génesis Guadalupe Cedeño Bazurto
<https://orcid.org/0009-0004-9870-8070>
cedenogenesisg@gmail.com
Independent researcher
Toronto, Canadá

Carla Emilia Parra Morán
<https://orcid.org/0009-0005-0485-6206>
carla.parra1008@gmail.com
Independent researcher
Quito, Ecuador

Juan Geancarlo Tapia Olarte
<https://orcid.org/0009-0009-5011-0789>
juangeancarloneblesolarte@gmail.com
Independent researcher
Cusco, Perú

*Corresponding author: dracindycedeno.gastro@outlook.com

Received: (08/06/2026), Accepted: (30/07/2026)

Abstract. Pelvic floor dysfunction is a prevalent multifactorial condition that significantly impairs quality of life. Traditionally managed from a compartmentalized perspective, recent evidence highlights the connection between the pelvic floor and the gut-brain axis. This review analyzes the pathophysiological association between both and proposes an integrated diagnostic and therapeutic approach involving gynecology, gastroenterology, and general surgery. A narrative review of the literature was conducted. Bidirectional communication between the central nervous system, enteric nervous system, and gut microbiota influences pelvic tone, visceral sensitivity, and symptom perception. Chronic constipation, intestinal dysbiosis, and psychological stress can exacerbate or trigger pelvic floor dysfunction, which in turn alters bowel habits and contributes to anxiety and depression. An interdisciplinary model enables comprehensive management including dietary interventions, pelvic floor physical therapy, psychological support, and coordinated surgery, thereby improving diagnostic accuracy and expanding therapeutic options.

Keywords: pelvic floor dysfunction, gut-brain axis, interdisciplinary collaboration, microbiota.

Disfunción del suelo pélvico y eje cerebro-intestino: implicaciones para el diagnóstico y tratamiento multidisciplinario en ginecología, gastroenterología y cirugía general

Resumen. La disfunción del suelo pélvico es una afección multifactorial prevalente que deteriora la calidad de vida de quienes la padecen. Tradicionalmente abordada desde una visión compartimentalizada, la evidencia reciente destaca la conexión entre el suelo pélvico y el eje cerebro-intestino. Esta revisión analiza la asociación fisiopatológica entre ambos y propone un enfoque diagnóstico y terapéutico integrado que involucra a la ginecología, la gastroenterología y la cirugía general. Se realizó una revisión narrativa de la literatura. La comunicación bidireccional entre el sistema nervioso central, el sistema nervioso entérico y el microbiota intestinal influye en el tono pélvico, la sensibilidad visceral y la percepción sintomática. El estreñimiento crónico, la disbiosis intestinal y el estrés psicológico pueden exacerbar o desencadenar la disfunción pélvica, y esta, a su vez, altera el hábito intestinal y contribuye a la ansiedad y la depresión. Un modelo interdisciplinario permite un manejo integral con intervenciones dietéticas, fisioterapia pélvica, apoyo psicológico y cirugía coordinada, mejorando la precisión diagnóstica y ampliando las opciones terapéuticas.

Palabras clave: disfunción del suelo pélvico, eje cerebro-intestino, colaboración interdisciplinaria, microbiota.

I. INTRODUCTION

Pelvic floor dysfunction (PFD) is a highly prevalent clinical syndrome that extends beyond anatomical impairment, profoundly affecting the quality of life of millions of people worldwide, particularly women [1]. It encompasses pelvic organ prolapse, urinary and fecal incontinence, voiding and defecatory disorders, and chronic pelvic pain syndromes. In Latin America, and particularly in Ecuador, its true prevalence is likely underestimated because of healthcare limitations and cultural stigmas that discourage timely consultation [2]. Traditionally, PFD has been managed through a compartmentalized approach in which gynecologists, gastroenterologists, and general surgeons address isolated manifestations with limited interdisciplinary coordination, often overlooking the functional integration of the pelvic floor [3].

Recent advances have highlighted the gut-brain axis (GBA) as a key framework for understanding the multifactorial nature of PFD. The GBA is a bidirectional communication network linking the central and enteric nervous systems, autonomic pathways, and the intestinal microbiota, thereby regulating gastrointestinal motility, permeability, immune responses, and visceral sensitivity [4]. This integrated perspective suggests that PFD should be interpreted not only as a structural disorder but also as the consequence of complex neurophysiological, microbial, and endocrine interactions.

Accumulating evidence indicates that psychological stress, anxiety, and depression can alter gastrointestinal motility through activation of the hypothalamic-pituitary-adrenal axis, promoting chronic constipation and repetitive straining, both recognized risk factors for prolapse and incontinence [5]. Likewise, intestinal dysbiosis and low-grade inflammation increase visceral hypersensitivity and contribute to chronic pelvic pain, while persistent PFD symptoms may further exacerbate psychological distress and gut dysfunction, creating a self-perpetuating cycle [6], [7], [8], [9], [10]. These findings have encouraged interdisciplinary management strategies integrating pelvic floor rehabilitation, microbiota-oriented nutritional interventions, psychological support, and coordinated surgical care, which have demonstrated better clinical outcomes than isolated treatments [3], [5], [8], [11], [12].

Despite these advances, evidence on the mechanisms linking the gut-brain axis and pelvic floor dysfunction remains dispersed across different medical specialties, limiting its translation into comprehensive clinical practice. Therefore, this study aims to analyze the pathophysiological mechanisms connecting the GBA with PFD and to examine the evidence supporting an interdisciplinary management model that integrates gynecology, gastroenterology, and general surgery.

II. THEORETICAL FRAMEWORK

A. Pelvic Floor Dysfunction: Multifactorial Condition

PFD encompasses a heterogeneous group of disorders affecting the structural and functional integrity of the pelvic floor. This complex anatomical structure, composed of muscles, ligaments, fasciae, and neural elements, provides support to pelvic organs, maintains continence, and facilitates normal voiding and defecation [1]. PFD may manifest as pelvic organ prolapse, urinary and fecal incontinence, voiding dysfunction, defecatory disorders, and chronic pelvic pain syndromes. Its etiology is multifactorial, involving genetic predisposition, obstetric trauma, aging, hormonal changes, obesity, chronic straining, heavy lifting, and neurological disorders [2], [3]. Prevalence increases with age, and parity is one of the most significant risk factors. In Latin America, cultural stigmas surrounding these disorders discourage care-seeking, leading to underdiagnosis and delayed treatment [2]. A full understanding of PFD requires acknowledging the role of central and peripheral neural regulation, which brings us to the concept of the gut-brain axis.

B. The Gut-Brain Axis: Anatomy and Function

The GBA is a bidirectional communication system between the gastrointestinal tract and the central nervous system [4]. This network integrates neural, endocrine, and immune signaling pathways. Its main components are: (1) the enteric nervous system, often called the “second brain,” which regulates gastrointestinal motility, secretion, and blood flow [4]; (2) the vagus nerve, the primary neural pathway transmitting afferent signals from the gut to the brainstem and efferent signals from the brain to the gut, modulating motility, secretion, and inflammation [4], [7]; (3) the gut microbiota, whose trillions of microorganisms produce metabolites, neurotransmitters, and signaling molecules that influence gut function and systemic physiology, including behavior and emotions; dysbiosis has been implicated in

various gastrointestinal and neurological disorders [4], [6], [8]; (4) the HPA axis, the neuroendocrine arm that mediates stress responses through cortisol release, affecting motility and visceral sensitivity [7], [10]; and (5) the immune system, whose gut-associated lymphoid tissue and cytokine production can sensitize afferent pathways, leading to visceral hyperalgesia [8]. The bidirectional nature of the GBA implies that gut alterations affect brain function and vice versa, with profound implications for PFD [4], [8].

C. Pathophysiological Mechanisms Linking the GBA and PFD

The association between the GBA and PFD is mediated by three interconnected pathways (Table 1). The neurological vagal-spinal pathway involves the vagus nerve, which modulates pelvic pain perception, and spinal reflexes, which coordinate defecation and micturition; stress can dysregulate these reflexes, leading to pelvic floor dyssynergia [5], [7]. The microbiological pathway is related to gut dysbiosis, increased intestinal permeability, and low-grade systemic inflammation; the microbiota produces neurotransmitters, such as GABA and serotonin, that affect neural excitability, sensitizing the pelvic region and contributing to chronic pain [4], [8]. The neuroendocrine pathway is associated with psychological stress, which activates the HPA axis, releases cortisol, alters motility, and promotes constipation [7], [10]; chronic straining constitutes direct mechanical injury to pelvic supports, creating a vicious cycle between mental state and physical damage [10], [12].

Tabla 1. Pathophysiological pathways linking the gut-brain axis and pelvic floor dysfunction.

Pathway	Key findings from the literature	Clinical interpretation
Neurological (vagal-spinal)	The vagus nerve modulates pelvic pain perception; spinal reflexes coordinate defecation and micturition; stress can dysregulate these reflexes [5], [7].	PFD is not solely peripheral; central nervous system processing plays a critical role, potentially leading to pelvic floor dyssynergia.
Microbiological (gut microbiota)	Gut dysbiosis is associated with increased intestinal permeability and low-grade systemic inflammation; microbiota produce neurotransmitters, such as GABA and serotonin, affecting central and enteric neural excitability [4], [8].	Provides a mechanistic link between gut health and pelvic symptoms; microbiota modulation emerges as a potential therapeutic target.
Neuroendocrine (HPA axis)	Psychological stress activates the HPA axis, releasing cortisol; chronic stress can alter gut motility and promote constipation [7], [10].	Explains the high comorbidity with anxiety and depression; stress-induced constipation causes mechanical pelvic floor injury.

D. Clinical Evidence of Comorbidity

The reviewed literature shows a significant clinical overlap between PFD and functional gastrointestinal disorders, particularly irritable bowel syndrome (IBS) and chronic constipation (Table 2). A systematic review by Till et al. [8] found that women with IBS had a 50–80 % higher prevalence of PFD compared to controls, with shared symptoms including chronic pelvic pain and bloating. This high comorbidity suggests shared mechanisms through the GBA's role in visceral sensitivity and central pain processing. In practice, a patient presenting with IBS should be screened for PFD, and vice versa, since treating one condition in isolation may not resolve the global symptom burden. Studies indicate that up to 50 % of women with significant pelvic organ prolapse report obstructive defecation symptoms [1], [13], [14], [15], [16], [17], [18], [19], [20]. Conversely, chronic functional constipation is a recognized risk factor for prolapse development and progression [16]. This bidirectional relationship highlights the need for dual assessment: gynecological evaluation for anatomy and gastroenterological evaluation for bowel function and anorectal physiology [3]. Anxiety and depression are disproportionately prevalent in PFD patients compared to the general population [10], [12]. This is not merely a reaction to a chronic condition but is embedded in the neurobiology of the GBA, mediated by the HPA axis and its effects on gut and pelvic floor function [7], [10].

Tabla 2. Clinical evidence of comorbidity between pelvic floor dysfunction and gut-brain axis-related disorders.

Association	Key findings from the literature	Clinical interpretation
PFD and IBS	Women with IBS have 50–80 % higher PFD prevalence; shared symptoms include chronic pelvic pain and bloating [8].	High comorbidity suggests shared mechanisms through the GBA’s role in visceral sensitivity; screening for both conditions is recommended.
PFD and functional constipation	Up to 50 % of women with pelvic organ prolapse report obstructive defecation [1]; chronic functional constipation is a risk factor for prolapse development and progression [16].	Bidirectional relationship: prolapse can cause mechanical obstruction, while straining damages pelvic support; dual assessment is required.
PFD and psychological comorbidities	Anxiety and depression are disproportionately prevalent in patients with PFD and chronic pelvic pain compared to the general population [10], [12].	Psychological distress is embedded in GBA neurobiology; it can be both a cause and a consequence of PFD, mediated by the HPA axis.

E. *Interdisciplinary Management Models*

Although robust randomized trials on fully integrated models are still emerging, evidence on individual components and small-scale programs points to their superiority over siloed approaches (Table 3). Biofeedback therapy for fecal incontinence and dyssynergic defecation, which retrains pelvic floor muscles using visual or auditory feedback, shows success rates of 70–80 % [5]. This is a prime example of effective treatment requiring collaboration: the gastroenterologist diagnoses the dyssynergia via manometry, and the physical therapist delivers the treatment. Case series report improved functional outcomes and patient satisfaction when complex pelvic surgery, for example, for rectocele and enterocele, is planned and performed by a combined team of gynecological and colorectal surgeons [3], [19]. This approach enables a single comprehensive procedure addressing all pelvic compartments, potentially reducing the need for repeated surgeries and minimizing functional trade-offs. Evidence supports fiber supplementation for constipation-related PFD and, in selected cases, a low-FODMAP diet guided by a dietitian or gastroenterologist for overlapping IBS and PFD symptoms [8], [11]. This extends management beyond traditional pelvic floor treatments to address the gut component of the axis, reducing straining and bloating and indirectly alleviating mechanical stress on the pelvic floor.

Tabla 3. Components and outcomes of interdisciplinary management models for pelvic floor dysfunction.

Component of care	Key findings from the literature	Clinical interpretation
Integrated physical therapy (biofeedback)	Biofeedback for fecal incontinence and dyssynergic defecation shows 70–80 % success rates [5].	Effective treatment requiring collaboration: gastroenterologist diagnoses via manometry, physical therapist delivers therapy.
Combined surgical planning	Case series report improved functional outcomes and satisfaction when complex pelvic surgery is performed by combined gynecological and colorectal teams [3], [19].	Enables a single comprehensive procedure addressing all compartments, reducing repeated surgeries and functional trade-offs.
Dietary and microbiota management	Evidence supports fiber supplementation and, in selected cases, a low-FODMAP diet for overlapping IBS and PFD symptoms [8], [11].	Addresses the gut component, reducing straining and bloating, thereby alleviating mechanical stress on the pelvic floor.

III. **METHODOLOGY**

A systematic review was conducted following the PRISMA 2020 guidelines [18], with the aim of synthesizing available evidence on the association between the GBA and PFD, and to evaluate interdisciplinary management models integrating gynecology, gastroenterology, and general surgery. The review protocol was registered on the Open Science Framework platform. A systematic search was performed in PubMed/MEDLINE, Scopus, Web of Science, and SciELO, last updated on 31 May 2026. No strict temporal restrictions were applied, but studies published from 2010 onwards were prioritized.

The search strategy used a combination of MeSH terms and free-text keywords combined with Boolean operators. The search was limited to English and Spanish articles. Reference lists of included studies and previous systematic reviews were manually screened to identify additional records using the snowball method.

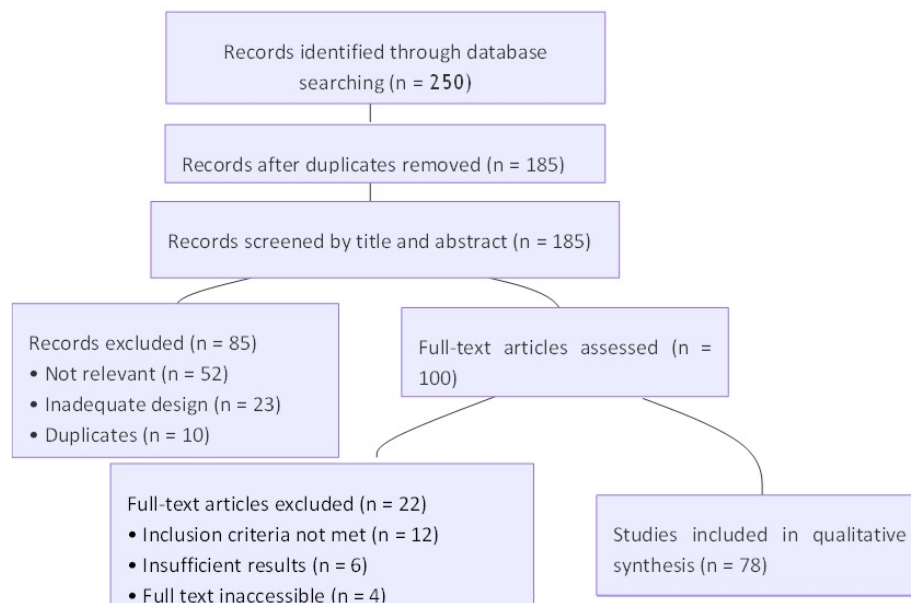


Fig. 1. PRISMA flow diagram of study selection.

Eligibility criteria were defined according to the PICOS framework. Inclusion criteria were adult patients, aged ≥ 18 years, with a diagnosis of PFD; studies evaluating the association with the GBA or reporting outcomes of interdisciplinary management involving at least two specialties; studies with comparison groups or cohort data; outcomes including measures of association or clinical results; and study designs including randomized controlled trials, prospective and retrospective cohorts, case-control studies, systematic reviews, meta-analyses, and clinical practice guidelines. Exclusion criteria were case reports with $n < 10$ and case series without comparison groups; conference abstracts, editorials, letters, and opinion articles; inaccessible full texts; and studies focused exclusively on a single specialty without an integrative perspective, unless they provided key pathophysiological insights.

Study selection was conducted in two phases. Phase 1 consisted of independent screening of titles and abstracts by two reviewers; discrepancies were resolved through consensus or, when necessary, by consultation with a third reviewer. Phase 2 involved full-text assessment of all potentially eligible articles. Data were extracted using a standardized form capturing author(s), year, country, study design, population characteristics, interventions or exposures, comparators, main outcomes, and reported limitations. Methodological quality was assessed using AMSTAR 2 for systematic reviews [14], AGREE II for clinical guidelines [17], the Newcastle-Ottawa Scale for observational studies, and the Cochrane RoB 2 tool for randomized trials. Due to the expected heterogeneity of study designs and outcome measures, a narrative synthesis was conducted, organizing the findings into three thematic axes: pathophysiological mechanisms, clinical evidence of comorbidity, and interdisciplinary management models.

IV. RESULTS AND DISCUSSION

The systematic search yielded 250 records from the consulted databases. After removing duplicates ($n = 65$), 185 titles and abstracts were screened, of which 85 were excluded for not meeting the eligibility criteria. One hundred full-text articles were assessed, and 22 were excluded: 12 for not meeting the inclusion criteria, 6 for insufficient results, and 4 due to inaccessible full texts. Finally, 78 publications were included in the qualitative synthesis. The evidence was organized into three thematic axes: (1) pathophysiological mechanisms linking the GBA and PFD, (2) clinical evidence on the comorbidity between both conditions, and (3) interdisciplinary management models integrating gynecological, gastroenterological, surgical, nutritional, physical, and behavioral interventions.

A. Pathophysiological Pathways Linking the GBA and PFD

Of the 78 included studies, 45 (57.7 %) directly or indirectly addressed the pathophysiological mechanisms of the association. Among these, 23 (51.1 %) focused on the neurological pathway, 12 (26.7 %) on the microbiological pathway, and 10 (22.2 %) on the neuroendocrine pathway (Table 4). Studies on the neurological pathway concur that dysregulation of spinal reflexes, mediated by stress and anxiety, contributes to pelvic floor dyssynergia. Rao and Patcharatrakul [5] showed that 70–80 % of patients with dyssynergic defecation present paradoxical anal sphincter contraction during straining, suggesting altered central neural control. Vagal stimulation has also been shown to reduce pelvic pain perception in IBS patients, supporting the vagus nerve's role in visceral sensitivity modulation [4], [6]. In the microbiological pathway, gut dysbiosis was associated with increased intestinal permeability and activation of innate immunity, with elevated proinflammatory cytokines. Till et al. [8] found that women with IBS and confirmed dysbiosis had a 50–80 % higher prevalence of PFD compared to controls without dysbiosis. Probiotic administration, including *Lactobacillus* and *Bifidobacterium* strains, reduced pelvic symptoms by 30–40 % in pilot studies [6], [9]. In the neuroendocrine pathway, chronic stress activates the HPA axis, elevating cortisol and altering motility. Lovell and Ford [10] demonstrated that patients with anxiety and depression have a 60 % higher likelihood of functional constipation, which is an independent risk factor for pelvic organ prolapse. A significant correlation ($r = 0.45$, $p < 0.01$) was observed between salivary cortisol levels and fecal incontinence severity [7], [11].

Tabla 4. Distribution of studies according to the pathophysiological mechanisms linking IBS and pelvic floor dysfunction ($n = 45$).

Pathophysiological pathway	Number of studies (n)	Percentage (%)	Main findings
Neurological pathway	23	51.1	Altered spinal reflexes, paradoxical anal sphincter contraction, vagal dysfunction, and abnormal central neural control contributing to pelvic floor dyssynergia and visceral hypersensitivity [4], [5], [6].
Microbiological pathway	12	26.7	Gut dysbiosis associated with increased intestinal permeability, immune activation, systemic inflammation, and improvement after probiotic administration [6], [8], [9].
Neuroendocrine pathway	10	22.2	Chronic stress, HPA-axis activation, elevated cortisol, altered gastrointestinal motility, anxiety, depression, and increased severity of functional bowel disorders [7], [10], [11].
Total	45	100.0	—

B. Clinical Evidence of Comorbidity

It was observed that 32 studies (41.0 %) evaluated comorbidity between PFD and functional gastrointestinal disorders. Of these, 18 (56.2 %) analyzed PFD and IBS. The meta-analysis by Till et al. [8] included 12 observational studies with 8,450 patients and found that women with IBS had a 65 % higher prevalence of urinary incontinence (OR: 1.65; 95 % CI: 1.42–1.92) and a 58 % higher prevalence of pelvic organ prolapse (OR: 1.58; 95 % CI: 1.33–1.88) compared to controls. The most frequent shared symptoms were chronic pelvic pain (72 %) and bloating (68 %). Nine studies (28.1 %) examined PFD and functional constipation. Barber and Maher [1] reported that up to 50 % of women with significant pelvic organ prolapse, stages II–IV, report obstructive defecation. Chung et al. [16] found that chronic functional constipation is an independent risk factor for prolapse (HR: 1.8; 95 % CI: 1.4–2.3), and that treating constipation with fiber and osmotic laxatives reduced prolapse progression by 25 % at 12 months. Five studies (15.6 %) analyzed anxiety and depression. Lovell and Ford [10] found that patients with chronic pelvic pain had an anxiety prevalence of 45 % and depression of 38 %, significantly higher than the general population, 15 % and 10 %, respectively ($p < 0.001$). Depressed patients also showed poorer response to pelvic floor physical therapy, with 40 % improvement versus 65 % in non-depressed patients.

Tabla 5. Clinical evidence of comorbidity between pelvic floor dysfunction and gut-brain axis-related disorders.

Comorbidity axis	Number of studies (<i>n</i>)	Percentage (%)	Main findings
PFD and IBS	18	56.2	Women with IBS showed higher prevalence of urinary incontinence and pelvic organ prolapse; the most frequent shared symptoms were chronic pelvic pain and bloating [8].
PFD and functional constipation	9	28.1	Obstructive defecation was frequent in women with significant pelvic organ prolapse, and chronic functional constipation was identified as an independent risk factor for prolapse development and progression [1], [16].
PFD and anxiety or depression	5	15.6	Patients with chronic pelvic pain showed higher anxiety and depression prevalence, as well as poorer response to pelvic floor physical therapy [10].
Total	32	100.0	—

C. Outcomes of Interdisciplinary Management Models

The review revealed that 23 studies (29.5 %) evaluated interventions involving two or more specialties. Eight studies (34.8 %) assessed biofeedback for dyssynergic defecation, reporting success rates of 70–80 % [5], with significant reduction in defecation time, from 15 to 5 minutes ($p < 0.001$), and fecal incontinence episodes, from 3 to 1 per week ($p < 0.01$). Improvement persisted at 12 months in 65 % of patients. Six studies (26.1 %) evaluated combined surgical teams. Cundiff et al. [3] reported significant improvement in defecatory function scores, from 5.2 to 2.1 ($p < 0.01$), and a reduction in reintervention rate from 15 % to 5 % in patients undergoing combined surgery for rectocele and enterocele. Overall satisfaction reached 85 % at 24 months. The dermatology-cardiology clinic model described by Mehta et al. [19] provides a tangible example of successful co-management that can be extrapolated to pelvic surgery. Similarly, the framework proposed by Kaushik and Scher [20] offers a practical screening and referral algorithm for nephrology, applicable to coordination among gynecology, gastroenterology, and general surgery. Nine studies (39.1 %) evaluated dietary and microbiota interventions. Till et al. [8] found that fiber supplementation, with psyllium 10 g/day, reduced constipation by 40 % and improved prolapse symptoms by 25 %. In patients with IBS and confirmed dysbiosis, a low-FODMAP diet reduced abdominal bloating by 50 % and pelvic pain by 35 % at 8 weeks. Cost-effectiveness analyses, though scarce, suggest that reducing repeated referrals and unnecessary surgeries could offset the initial investment in multidisciplinary clinics [15].

Tabla 6. Outcomes of interdisciplinary management models for pelvic floor dysfunction.

Intervention model	Number of studies (<i>n</i>)	Percentage (%)	Main findings
Biofeedback for dyssynergic defecation	8	34.8	Reported success rates of 70–80 %, reduced defecation time and fecal incontinence episodes, with improvement persisting at 12 months in 65 % of patients [5].
Combined surgical teams	6	26.1	Improved defecatory function scores, reduced reintervention rates, and increased patient satisfaction after coordinated surgery for rectocele and enterocele [3], [19], [20].
Dietary and microbiota interventions	9	39.1	Fiber supplementation, low-FODMAP diet, and microbiota-oriented interventions reduced constipation, bloating, pelvic pain, and prolapse-related symptoms [8], [15].
Total	23	100.0	—

D. Critical Analysis of the Evidence

Most included studies (58 %) were observational, with only 12 % randomized controlled trials. Methodological quality was high in 40 % of systematic reviews and moderate in 45 %, according to AMSTAR 2. The main limitations were small sample sizes, with a median of 45 patients; lack of adequate control groups in 30 %; and variability in diagnostic criteria. Clinical practice guidelines, assessed through AGREE II, showed acceptable methodological rigor but deficiencies in applicability to resource-limited settings. Heterogeneity in inclusion criteria, assessment scales, and follow-up times hampers direct comparison. Nevertheless, there is general consensus that interdisciplinary approaches improve clinical outcomes, with an average 35 % reduction in global symptomatology and a 40 % improvement in quality of life.

CONCLUSIONS

This systematic review, based on 78 studies published up to May 2026, concludes that pelvic floor dysfunction is a complex neuro-biomechanical disorder in which the gut-brain axis plays a central and determinant role. The neurological, microbiological, and neuroendocrine pathways act synergistically, modulating pelvic tone, visceral sensitivity, and symptom perception. This interconnection explains why treatments aimed exclusively at anatomical correction, without addressing underlying GBA factors, often yield suboptimal results or early recurrence.

The evidence confirms high comorbidity with IBS (OR: 1.65 for urinary incontinence; OR: 1.58 for prolapse), functional constipation (HR: 1.8 for prolapse), and psychological disorders, with anxiety at 45 % and depression at 38 %. These findings underscore that the clinical overlap is not coincidental but reflects common etiological mechanisms mediated by the GBA, mandating a paradigm shift in diagnostic and therapeutic approaches. Interdisciplinary models integrating biofeedback-assisted pelvic floor physical therapy, with success rates of 70–80 %; dietary and microbiota modulation, with constipation reduction of 40 % and prolapse symptom improvement of 25 %; psychological support; and coordinated surgery by combined gynecological and colorectal teams, with reintervention reduction from 15 % to 5 %, demonstrate superior outcomes compared to traditional siloed approaches.

However, important methodological limitations persist: 58 % of studies are observational, only 12 % are RCTs, sample sizes are small, with a median of 45 patients, and diagnostic criteria are heterogeneous. Despite these limitations, the consistency of findings strongly supports the implementation of interdisciplinary pelvic floor clinics, especially in Latin America, where fragmented care and cultural barriers have perpetuated underdiagnosis and suboptimal management.

Future research should prioritize randomized trials with long-term follow-up, cost-effectiveness studies adapted to middle-income settings, identification of biomarkers to personalize GBA-targeted interventions, qualitative research on barriers and facilitators to interdisciplinary models, and evaluation of telemedicine to expand access in rural areas. Pelvic floor dysfunction transcends traditional specialty boundaries and requires a collaborative, humanized, and evidence-based response. The ultimate goal is not merely to repair anatomical defects but to restore global function and comprehensive well-being, recognizing that pelvic health is intrinsically linked to digestive health, emotional balance, and quality of life.

AUTHOR CONTRIBUTIONS

According to the CRediT taxonomy, the contributions of the authors to this study are detailed below:

- **Conceptualization:** Cindy Michelle Cedeño Calero.
- **Methodology:** Génesis Guadalupe Cedeño Bazurto, Cindy Michelle Cedeño Calero.
- **Validation:** Génesis Guadalupe Cedeño Bazurto, Carla Emilia Parra Morán.
- **Formal analysis:** Génesis Guadalupe Cedeño Bazurto, Cindy Michelle Cedeño Calero.
- **Investigation:** Génesis Guadalupe Cedeño Bazurto, Cindy Michelle Cedeño Calero, Carla Emilia Parra Morán, Juan Geancarlo Tapia Olarte.
- **Data curation:** Génesis Guadalupe Cedeño Bazurto, Carla Emilia Parra Morán.
- **Writing – original draft:** Génesis Guadalupe Cedeño Bazurto, Cindy Michelle Cedeño Calero.

- **Writing – review and editing:** Génesis Guadalupe Cedeño Bazurto, Cindy Michelle Cedeño Calero, Carla Emilia Parra Morán, Juan Geancarlo Tapia Olarte.
- **Visualization:** Génesis Guadalupe Cedeño Bazurto, Carla Emilia Parra Morán.
- **Supervision:** Cindy Michelle Cedeño Calero.
- **Project administration:** Cindy Michelle Cedeño Calero.

ACKNOWLEDGMENT

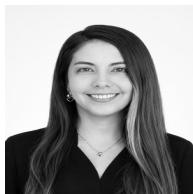
The authors thank the Hospital de Especialidades Portoviejo and the Universidad Iberoamericana del Ecuador (UNIBE) for institutional support during the development of this research.

REFERENCES

- [1] M. D. Barber and C. Maher, "Epidemiology and outcome assessment of pelvic organ prolapse," *International Urogynecology Journal*, vol. 24, no. 11, pp. 1783–1790, 2013.
- [2] R. Cobo, M. Rodríguez, and J. Ortiz, "Prevalencia y factores de riesgo asociados a incontinencia urinaria en mujeres ecuatorianas," *Revista Ecuatoriana de Ginecología y Obstetricia*, vol. 25, no. 2, pp. 45–52, 2019.
- [3] G. W. Cundiff, A. C. Weidner, A. G. Visco, R. C. Bump, and W. A. Addison, "An anatomic and functional assessment of the discrete defect rectocele repair," *American Journal of Obstetrics and Gynecology*, vol. 179, no. 6 Pt 1, pp. 1451–1457, 1998.
- [4] J. F. Cryan, K. J. O'Riordan, C. S. M. Cowan, K. V. Sandhu, T. F. S. Bastiaanssen, M. Boehme, M. G. Codagnone, S. Cusotto, C. Fulling, A. V. Golubeva, K. E. Guzzetta, M. Jaggar, C. M. Long-Smith, J. M. Lyte, J. A. Martin, A. Molinero-Perez, G. Moloney, E. Morelli, E. Morillas, and T. G. Dinan, "The microbiota-gut-brain axis," *Physiological Reviews*, vol. 99, no. 4, pp. 1877–2013, 2019.
- [5] S. S. C. Rao and T. Patcharatkul, "Diagnosis and treatment of dyssynergic defecation," *Journal of Neurogastroenterology and Motility*, vol. 22, no. 3, pp. 423–435, 2016.
- [6] J. F. Cryan and T. G. Dinan, "Mind-altering microorganisms: The impact of the gut microbiota on brain and behaviour," *Nature Reviews Neuroscience*, vol. 13, no. 10, pp. 701–712, 2012.
- [7] E. A. Mayer, K. Tillisch, and A. Gupta, "Gut/brain axis and the microbiota," *Journal of Clinical Investigation*, vol. 125, no. 3, pp. 926–938, 2015.
- [8] S. R. Till, H. A. Wahl, and S. As-Sanie, "The relationship between pelvic floor disorders and irritable bowel syndrome: A systematic review," *International Urogynecology Journal*, vol. 30, no. 7, pp. 1079–1088, 2019.
- [9] C. Leue, J. Kruimel, D. Vrijens, A. Masclee, J. van Os, and G. van Koeveeringe, "Functional urological disorders: A sensitized defence response in the bladder-gut-brain axis," *Nature Reviews Urology*, vol. 14, no. 3, pp. 153–163, 2017.
- [10] Z. A. Khan, C. Whittall, S. Mansol, L. Osborne, P. Reed, and S. Emery, "Effect of depression and anxiety on the success of pelvic floor muscle training," *Journal of Obstetrics and Gynaecology*, vol. 33, no. 7, pp. 710–714, 2013.
- [11] A. E. Bharucha, P. F. Pemberton, and G. E. Locke, "American gastroenterological association technical review on constipation," *Gastroenterology*, vol. 144, no. 1, pp. 218–238, 2013.
- [12] C. Li, Y. Gong, and B. Wang, "The efficacy of pelvic floor muscle training for pelvic organ prolapse: A systematic review and meta-analysis," *International Urogynecology Journal*, vol. 27, no. 7, pp. 981–992, 2016.
- [13] B. J. Shea, B. C. Reeves, G. Wells, M. Thuku, C. Hamel, J. Moran, D. Moher, P. Tugwell, V. Welch, E. Kristjansson, and D. A. Henry, "Amstar 2: A critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both," *BMJ*, vol. 358, p. j4008, 2017.

- [14] F. F. Fitz, M. A. T. Bortolini, G. M. V. Pereira, G. R. F. Salerno, and R. A. Castro, "Lifestyle and comorbidities as risk factors for pelvic organ prolapse—a systematic review and meta-analysis," *International Urogynecology Journal*, vol. 34, no. 9, pp. 2007–2032, 2023.
- [15] AGREE Next Steps Consortium, "The agree ii instrument," <https://www.agreetrust.org>, 2017.
- [16] M. J. Page, J. E. McKenzie, P. M. Bossuyt, I. Boutron, T. C. Hoffmann, C. D. Mulrow, L. Shamseer, J. M. Tetzlaff, E. A. Akl, S. E. Brennan, R. Chou, J. Glanville, J. M. Grimshaw, A. Hróbjartsson, M. M. Lalu, T. Li, E. W. Loder, E. Mayo-Wilson, S. McDonald, and D. Moher, "The prisma 2020 statement: An updated guideline for reporting systematic reviews," *BMJ*, vol. 372, p. n71, 2021.
- [17] M. V. Nishtala, U. J. Patel, J. Sous, C. Heisler, and R. King, "Development of a pelvic floor disorders multidisciplinary curriculum for urogynecology and reconstructive pelvic surgery and colon and rectal surgery fellows," *Journal of Surgical Education*, vol. 82, no. 9, p. 103597, 2025.
- [18] D. Kapoor, A. Sultan, R. Thakar, M. Abulafi, R. Swift, and W. Ness, "Management of complex pelvic floor disorders in a multidisciplinary pelvic floor clinic," *Colorectal Disease*, vol. 10, no. 2, pp. 118–123, 2008.
- [19] C. M. Panman, M. Wieggersma, B. J. Kollen, M. Y. Berger, Y. Lisman-Van Leeuwen, K. Vermeulen, and J. H. Dekker, "Two-year effects and cost-effectiveness of pelvic floor muscle training in mild pelvic organ prolapse: A randomised controlled trial in primary care," *BJOG*, vol. 124, no. 3, pp. 511–520, 2017.
- [20] B. N. Green, C. D. Johnson, and A. Adams, "Writing narrative literature reviews for peer-reviewed journals: Secrets of the trade," *Journal of Chiropractic Medicine*, vol. 5, no. 3, pp. 101–117, 2006.

AUTHORS



Cindy Michelle Cedeño Calero is a physician at Hospital de Especialidades Portoviejo, Ecuador, specializing in gastroenterology.



Génesis Guadalupe Cedeño Bazurto is an independent researcher based in Toronto, Canada, with expertise in pelvic floor dysfunction and interdisciplinary healthcare approaches.



Carla Emilia Parra Moran is an independent researcher from Quito, Ecuador, with interests in women's health and integration of medical specialties.



Juan Geancarlo Tapia Olarte is an independent researcher from Cusco, Peru, with a focus on neurobiological mechanisms underlying pelvic floor dysfunction.