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Original Research Article

PREVALENCE OF ANXIETY AND DEPRESSION IN FUNCTIONAL DYSPEPSIA PATIENTS

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ABSTRACT

Background: Functional dyspepsia (FD) is one of the most common disorders of gut–brain interaction and is frequently associated with psychological comorbidities such as anxiety and depression. These conditions may aggravate dyspeptic symptoms, impair quality of life, and adversely affect treatment outcomes. However, the prevalence of anxiety and depression among patients with FD and their relationship with symptom severity remain inadequately explored. **Objective:** To determine the prevalence of anxiety and depression among patients with functional dyspepsia and to evaluate the relationship between the severity of anxiety and depression and the severity of dyspeptic symptoms.

Materials and Methods: This hospital-based observational cross-sectional study included 730 patients diagnosed with functional dyspepsia according to the Rome IV criteria between September 2023 and January 2026. Demographic and clinical data were recorded. Functional dyspepsia was classified into Epigastric Pain Syndrome (EPS), Postprandial Distress Syndrome (PDS), and overlap syndrome. Anxiety and depression were assessed using a standardized psychological assessment tool. Statistical analysis was performed using SPSS version 26.0, and a p-value <0.05 was considered statistically significant.

Results: Among 730 patients, anxiety was present in 386 (52.9%) and depression in 342 (46.8%). Postprandial Distress Syndrome was the predominant subtype (48.8%), and moderate dyspepsia was observed in 48.2% of patients. The prevalence of both anxiety and depression increased significantly with increasing severity of dyspeptic symptoms (p<0.001). Coexisting anxiety and depression were observed in 37.5% of patients.

Conclusion: Anxiety and depression are highly prevalent among patients with functional dyspepsia and are significantly associated with greater dyspeptic symptom severity. Routine psychological screening and a multidisciplinary management approach may improve clinical outcomes and quality of life in patients with functional dyspepsia.

Keywords: Functional dyspepsia, Anxiety, Depression, Gut–brain axis, Rome IV criteria, Psychological comorbidity.

INTRODUCTION

Functional dyspepsia (FD) is a common disorder of gut–brain interaction characterized by persistent or recurrent upper gastrointestinal symptoms in the absence of any identifiable structural or biochemical abnormality. Recent evidence highlights that disturbances in neural regulation and gut–brain communication play an important role in symptom generation, and neuromodulators have emerged as useful therapeutic options in selected patients.[1] Functional dyspepsia commonly presents with

postprandial fullness, early satiety, epigastric pain, and epigastric burning, significantly impairing patients' quality of life and increasing healthcare utilization worldwide.[2]

According to the Rome IV diagnostic criteria, functional dyspepsia is classified into two clinical subtypes: Postprandial Distress Syndrome (PDS) and Epigastric Pain Syndrome (EPS). These subtypes may occur independently or overlap in the same patient, reflecting the heterogeneous nature of the disease. Rome IV also recognizes functional dyspepsia as a disorder of gut–brain interaction, emphasizing the role of altered communication between the central nervous system and the gastrointestinal tract in disease pathogenesis.[3,4]

Functional dyspepsia represents a substantial global health burden. A recent systematic review and meta-analysis including studies published between 1990 and 2020 reported considerable worldwide prevalence, although estimates vary according to the diagnostic criteria and geographical region. The disorder affects individuals of all age groups and is associated with impaired daily activities, reduced work productivity, increased healthcare costs, and diminished quality of life. Despite its high prevalence, its underlying mechanisms remain multifactorial and incompletely understood.[5]

Growing evidence suggests that psychological factors contribute significantly to the development and persistence of functional dyspepsia. Anxiety, depression, chronic stress, and other psychosocial disorders can influence gastric motility, visceral sensitivity, autonomic nervous system activity, and hypothalamic-pituitary-adrenal axis function, thereby aggravating dyspeptic symptoms. Likewise, persistent gastrointestinal symptoms may adversely affect mental health, resulting in a bidirectional relationship between functional dyspepsia and psychological disorders. Consequently, functional dyspepsia is increasingly regarded as a biopsychosocial disorder requiring comprehensive clinical evaluation.[6]

Long-term epidemiological studies have demonstrated that anxiety is not merely a consequence of dyspeptic symptoms but may also precede the onset of functional dyspepsia. A population-based follow-up study reported that individuals with anxiety had a significantly increased risk of developing new-onset dyspepsia over time. These findings indicate that psychological disturbances may serve as independent risk factors for functional dyspepsia and may influence disease severity, treatment response, and long-term prognosis.[7]

The gut–brain axis provides the biological basis for this association by facilitating continuous bidirectional communication between the gastrointestinal tract and the central nervous system through neural, endocrine, immune, and microbial pathways. Alterations in this complex communication network can lead to both gastrointestinal dysfunction and psychological distress, creating a self-perpetuating cycle that contributes to chronic symptom persistence. Recognition of this interaction has led to increasing emphasis on integrating psychological assessment into the routine management of patients with functional dyspepsia.[8]

Although numerous studies have reported an association between functional dyspepsia and psychological disorders, the prevalence of anxiety and depression among patients with functional dyspepsia varies considerably across different populations and healthcare settings. Furthermore, limited data are available regarding the relationship between the severity of anxiety and depression and the severity of dyspeptic symptoms in many clinical populations. Therefore, the present study was undertaken to determine the prevalence of anxiety and depression among patients with functional dyspepsia and to evaluate the relationship between the severity of psychological disorders and the severity of dyspeptic symptoms.

MATERIALS AND METHODS

Study Design and Setting

This was a hospital-based, observational, cross-sectional study conducted in the Department of Gastroenterology over a period of 29 months from September 2023 to January 2026. The study was carried out after obtaining approval from the Institutional Ethics Committee, and all participants provided written informed consent before enrollment.

Study Population

The study included adult patients diagnosed with functional dyspepsia attending the outpatient and inpatient services of the Department of Gastroenterology during the study period. Functional dyspepsia was diagnosed according to the Rome IV diagnostic criteria after appropriate clinical evaluation and exclusion of organic gastrointestinal diseases.

Sample Size

A total of **730 consecutive patients** fulfilling the eligibility criteria were included in the study.

Inclusion Criteria

- Patients aged 18 years or above.
- Patients diagnosed with functional dyspepsia according to the Rome IV criteria.
- Patients willing to participate and provide written informed consent.

Exclusion Criteria

- Patients with evidence of organic gastrointestinal diseases such as peptic ulcer disease, gastrointestinal malignancy, inflammatory bowel disease, or celiac disease.
- Patients with previous upper gastrointestinal surgery.
- Patients with severe systemic illness or neurological disorders affecting psychological assessment.

- Patients with previously diagnosed psychiatric disorders receiving psychiatric treatment.
- Pregnant or lactating women.
- Patients unwilling to participate in the study.

Data Collection

A structured case record form was used to collect demographic details including age, gender, and duration of symptoms. Clinical evaluation was performed to classify functional dyspepsia into Epigastric Pain Syndrome (EPS), Postprandial Distress Syndrome (PDS), or overlap syndrome according to the Rome IV criteria. The severity of dyspeptic symptoms was categorized as mild, moderate, or severe based on symptom frequency and intensity.

Psychological assessment was performed using standardized validated questionnaires. Anxiety and depression were assessed using the **Hospital Anxiety and Depression Scale (HADS)**. Anxiety and depression scores were classified into appropriate severity categories according to the standard HADS scoring system. The prevalence of anxiety and depression among patients with functional dyspepsia was determined, and their relationship with dyspeptic symptom severity was evaluated.

Outcome Measures

Primary Outcome

- Prevalence of anxiety and depression among patients with functional dyspepsia.

Secondary Outcome

- Association between the severity of anxiety and depression and the severity of dyspeptic symptoms.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation, whereas categorical variables were presented as frequencies and percentages. The Chi-square test was used to assess the association between categorical variables, including dyspeptic symptom severity and anxiety/depression. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Baseline Demographic and Clinical Characteristics of Functional Dyspepsia Patients (n = 730)

Variable	Category	Number of Cases	Percentage
Age (years)	18–30	126	17.3
	31–40	184	25.2
	41–50	176	24.1
	51–60	142	19.5
	>60	102	14
Gender	Male	318	43.6
	Female	412	56.4
Duration of Symptoms	<6 months	198	27.1
	6–12 months	302	41.4
	>12 months	230	31.5

Table 2: Clinical Profile of Functional Dyspepsias

Variable	Number of Cases	Percentage
Epigastric Pain Syndrome (EPS)	238	32.60
Postprandial Distress Syndrome (PDS)	356	48.80
Overlap (EPS + PDS)	136	18.60
Mild Dyspepsia	168	23.00
Moderate Dyspepsia	352	48.20
Severe Dyspepsia	210	28.80

Table 3: Prevalence and Severity of Anxiety and Depression

Variable	Number of Cases	Percentage
Anxiety Present	386	52.9
Anxiety Absent	344	47.1
Mild Anxiety	152	20.8
Moderate Anxiety	158	21.6
Severe Anxiety	76	10.4
Depression Present	342	46.8
Depression Absent	388	53.2
Mild Depression	138	18.9
Moderate Depression	142	19.5
Severe Depression	62	8.5

Table 4: Association Between Severity of Dyspeptic Symptoms and Anxiety

Dyspepsia Severity	Anxiety Present	Anxiety Absent	p-value
Mild (n=168)	62 (36.9%)	106 (63.1%)	<0.001
Moderate (n=352)	184 (52.3%)	168 (47.7%)	
Severe (n=210)	140 (66.7%)	70 (33.3%)	

Table 5: Association Between Severity of Dyspeptic Symptoms and Depression

Dyspepsia Severity	Depression Present	Depression Absent	p-value
Mild (n=168)	54 (32.1%)	114 (67.9%)	<0.001
Moderate (n=352)	160 (45.5%)	192 (54.5%)	
Severe (n=210)	128 (61.0%)	82 (39.0%)	

Table 6: Relationship Between Anxiety and Depression

Variable	Number of Cases (%)
Anxiety only	112 (15.3%)
Depression only	68 (9.3%)
Both Anxiety and Depression	274 (37.5%)
Neither Anxiety nor Depression	276 (37.9%)
Total	730 (100%)

DISCUSSION

The present study demonstrated that anxiety and depression are common psychological comorbidities among patients with functional dyspepsia (FD). More than half of the study participants had anxiety (52.9%), while depression was observed in 46.8% of patients. Furthermore, increasing severity of dyspeptic symptoms was significantly associated with higher rates of both anxiety and depression, emphasizing the close interaction between gastrointestinal symptoms and mental health.

The baseline characteristics of the study showed that functional dyspepsia was more frequent among females (56.4%) than males (43.6%), with the highest proportion of patients belonging to the 31–40-year age group. Most patients had symptoms for 6–12 months before presentation. These findings are consistent with previous epidemiological evidence showing that FD predominantly affects young and middle-aged adults and is more frequently reported in women. Mahadeva and Ford also described regional variations in disease prevalence while highlighting female predominance and the considerable impact of FD on quality of life and healthcare utilization.[9]

Regarding the clinical profile, Postprandial Distress Syndrome (PDS) was the most common subtype (48.8%), followed by Epigastric Pain Syndrome (EPS) (32.6%), while 18.6% of patients had overlapping features. Nearly half of the patients experienced moderate dyspeptic symptoms. These findings are comparable with current clinical observations indicating that PDS is generally the predominant clinical presentation. Madisch et al. emphasized that careful characterization of symptom patterns is important because different FD subtypes may respond differently to therapeutic interventions and often require individualized management strategies.[10]

The primary objective of this study was to determine the prevalence of anxiety and depression among patients with functional dyspepsia. Anxiety was present in 52.9% of patients, whereas depression affected 46.8%. Moderate anxiety and moderate depression constituted the largest proportion among psychologically affected patients. These findings support the growing recognition that psychological disorders are highly prevalent in FD and significantly contribute to disease burden. A bibliometric analysis by Huang et al. demonstrated that research focusing on anxiety, depression, gut–brain interaction, and quality of life in functional dyspepsia has increased considerably over the past two decades, reflecting the expanding clinical importance of psychological assessment in these patients.[11]

The secondary objective was to evaluate the relationship between psychological disorders and dyspeptic symptom severity. In the present study, anxiety and depression increased significantly with increasing severity of dyspeptic symptoms ($p<0.001$). Patients with severe dyspepsia showed the highest prevalence of both anxiety and depression compared with those having mild symptoms. These findings suggest that psychological distress may influence symptom perception, visceral hypersensitivity, and treatment outcomes. Tan et al. explained that alterations in the gut–brain axis, autonomic nervous system, immune responses, intestinal microbiota, and hypothalamic–pituitary–adrenal axis contribute to the frequent coexistence of functional gastrointestinal disorders and mental disorders, supporting the biological basis of this association.[12]

CONCLUSION

The present study demonstrated that anxiety and depression are common psychological comorbidities among patients with functional dyspepsia, with anxiety being slightly more prevalent than depression. A significant positive association was observed between the severity of dyspeptic symptoms and the prevalence of both anxiety and depression, indicating that psychological distress

increases with worsening gastrointestinal symptoms. These findings support the concept that functional dyspepsia is a disorder of gut–brain interaction in which psychological factors play a crucial role in symptom manifestation and disease progression.

Routine screening for anxiety and depression should be incorporated into the clinical evaluation of patients with functional dyspepsia to facilitate early identification and appropriate management. A multidisciplinary approach integrating gastroenterological treatment with psychological assessment and intervention may improve symptom control, treatment response, and overall quality of life. Further multicenter prospective studies are recommended to better understand the causal relationship between psychological disorders and functional dyspepsia and to develop comprehensive management strategies.

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